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Measuring the impact of governance indicators - Kaufman - on economic growth using ARDL model, case Algeria over (2000-2023)

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Abstract :
This study aimed to determine the nature and direction of the relationship between governance indicators and their impact on economic growth in Algeria during the period 2000-2023 using the ARDL self-regression model. In order to test the relationship between the two variables under study, a standard model was built to know the impact of governance through its indicators on economic growth, where the study found an almost absolute relationship to governance indicators according to Kaufman, where we excluded through the standard study the neglected effects (non-existent) of each of the indicators (GEA, CC, RL), while in the short term the study was able to limit the impact of each of (VA, RL, PS, CC), and the study model regains equilibrium after 7 months.

Keywords: governance, Kaufman indicators, economic growth, ARDL model, econometric impact.
Jel Classification Codes G3, O4, C5, C1

Introduction :

The subject of governance and its importance in promoting and raising economic growth rates is at the forefront of issues that concern the economies of most countries, as Algeria is considered one of the countries whose economic policies depend on the application and activation of the role of good governance, as the

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presence of the state is a key factor in effective decision-making, especially in enhancing transparency and accountability and protecting the ocean from dangers and threats in various fields, and for this many economic studies have sought to identify and analyze governance indicators and their impact on economic growth in order to reach Economic models with an explanatory ability to the nature of the relationship between governance indicators and economic growth, and from this study came to highlight the most important governance determinants that affect economic growth in Algeria during the period from 2000-2023

The problem of the study: In light of the above, the following problem can be raised:

What is the impact of governance indicators on economic growth in Algeria during the period 2000-2023?

Study hypothesis: To answer the problem posed, the following hypothesis will be adopted:

_Economic growth responds to Kaufman's short-term governance indicators positively.

The importance of the study: The importance of the study appears in the relationship between governance indicators and their strong impact on achieving high economic growth rates as an effective tool of economic reform, so we will try through this study to shed light on measuring the quantitative impact of governance indicators on economic growth in Algeria during the study period.

Objectives of the study: This study aims to test the impact of the relationship between governance indicators and economic growth in Algeria during the study period, based on statistical and mathematical tools and methods used in econometric analysis. As well as providing a set of proposals that help enhance and activate the role of governance in raising economic growth rates.

Previous studies:

- A study by Syed Ali (2020): The impact of corruption and governance indicators on economic growth in the Arab countries for the period (1996-2017), Al-Riyada Journal for Business Economics, Volume 06, Issue 02, This study aimed to determine the impact of corruption and governance indicators on economic growth in 13 Arab countries using the static panel model. The study reached the following results: that the best model for estimation is the static panel model, corruption has a negative impact on economic growth, there is no effect between the government effectiveness index and political stability on Economic growth, education is one of the important variables that affect economic growth in the Arab countries.

- Serdouk Belhoul (2019): Governance, Foreign Direct Investment and Economic Growth in Emerging Countries, PhD thesis in Economic Sciences specializing in development strategy and economic policies, Faculty of Economic, Commercial and Management Sciences, Mustafa Istanbul Mascara University, the study aimed at the relationship between governance and economic growth in emerging countries using panel data for a sample of 13 countries for the period between (1996-2016). The researcher found that there is a long-term relationship between the variables of the study and that its coefficients It is concluded that governance has a positive relationship with economic growth in the long term, but no relationship has been found in the short term, one of the most important points that he stopped at is that governance promotes economic growth by providing effective institutions and improving the implementation of public policies directed to the accumulation of human capital.

- Compos and Nugent study: The researchers used five governance indicators for 108 countries in 1999 and found a positive relationship between all indicators and economic growth (measured by average GDP per capita).

In order to answer the problem posed and test the hypothesis, the study was divided into three axes:

*** The first axis:** a general introduction to governance

*** The second axis:** the impact of governance on economic growth

*** The third axis:** an econometric model of the impact of Kaufman's governance indicators on economic growth in Algeria during the period 2000-2023.

First: A general introduction to governance

1. governance

1.1. Emergence of Governance:

Many studies confirm that the emergence of the concept of governance came as a result of the development of many modern management theories, and this is due to the economic collapses and financial crises witnessed by a group of major countries, so that governance derives its historical roots through the theory of agency, which emerged through the work of both (berle & Mens).) in 1932, so that this theory is based on the idea of separating management from ownership and the need to strengthen the mechanisms of control and follow-up on performance by finding the appropriate structure through which the objectives of the bank and the means of achieving them are determined.

Meckling andJensen in 1976 andFama in 1980 also addressed the problem of the agency where they pointed to the inevitability of conflict in the institution when there is a separation between ownership and management, which ultimately leads to the emergence of agency costs. through controls imposed by shareholders on managers[1].

In general, the most important motives that led to the emergence of governance can be summarized:

- The need to improve trust and credibility in business so that these two elements are important in business and by adopting governance practices companies can achieve higher levels of transparency and accountability.
- Separation between ownership and management and achieving control and follow-up on performance.
- The need to control risks, so that governance is one of the important tools and means for companies to control risk rates, especially financial risks.
- Increase the awareness of management officials and stakeholders on corporate governance.
- Increasing regulatory and legislative pressures on companies due to the increasing rates of financial and administrative corruption.

[1] - narmin, a. *coporate governance: the way forward with shrdding light on yhe egyptian experience.* Egypt: center for internayional projects 2003, p. 03

1.2 Concept of Governance:

The Organization for Economic Co-operation (OECD) defined **"**governance as the set of relationships between an organization's management, board of directors, shareholders and stakeholders"[1].

It is also defined as a set of laws and standards that determine the relationship between the company's management on the one hand and shareholders and stakeholders or parties associated with the company such as (bondholders, workers, creditors, customers) on the other hand[2].

The World Bank (IB) defined corporate governance as "the rules that guide the conduct of companies, shareholders and corporate governance, as well as actions to enforce and strengthen the application of those rules"[3].

It is also defined as a set of mechanisms, procedures, laws, regulations and decisions that include discipline, transparency and justice with the aim of achieving quality and excellence in performance by activating the actions of the management of the economic unit with regard to the exploitation of the economic resources available to it in order to achieve the best possible benefits for all stakeholders and society as a whole[4].

The International Finance Corporation (ICF) has also defined corporate governance as "the system through which companies are managed and their business is controlled"[5].

Based on the above, governance can be defined as the procedures and steps through which the company is managed, directed and controlled, including mechanisms to regulate these various relationships between the board of directors, executive directors, shareholders and stakeholders according to a specific structure that includes the distribution of rights and duties among those involved in the management of the company, with the aim of achieving justice, transparency and competitiveness.

2. Governance characteristics:

The characteristics of governance are embodied in the following most important features[6]:

* **Discipline:** following appropriate and correct ethical behavior.
* **Transparency:** that is, progressive A true picture of everything that happens.
* **Independence:** meaning there are no unnecessary influences and pressures to work.
* **Accountability:** meaning the possibility of evaluating and appreciating the work of the Board of Directors and executive management.
* **Liability:** which is the existence of liability to all stakeholders in the enterprise.

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1 - Alain, j., & christaine, l., sustainable development vero a new corporate governance afior. Franch, 2003, p. 75.

2 - abdel muttalib, a., strategic perspective of economic transformations for the twenty first century. Egypt: University house alexandaria, 2008, p. 404.

3 - ahmed, a. k.,corporate governance. Egypt: dar alfikr aljamia Alexandria, 2012, p. 90.

4 - salah eldin, h. s., supervision of the managment of banks and business organizations (1 ed.). egypt: dar alkitab alhadith, 2010, p. 34.

5 - Ezzat, m. k., & mohamed, F., Corporate governance and its potential implementation in Egypt in light of international experiences. journal of public administration and policy research, 1(5) ,2009, p. 86.

6 - Tarek, a. h., corporate governance and private sector companies and banks(principles,experience,instruction) (2 ed.). cairo: university house, 2007, p. 25.

* **Justice:** Respect for the rights of different stakeholder groups in the enterprise.
* **Social responsibility:** that is, looking at the company as a good citizen.

3. Principles of Governance:

Governance is based on a set of principles that represent its basic pillars, the Organization for Economic Cooperation and Development (OECD) has developed an integrated structure for the governance system in order to build sound governance or reform existing governance systems, and these principles approved by the Organization in 2004 include six principles that are addressed as follows:

Principle I: Ensure that there is a basis for an effective corporate governance framework

The corporate governance framework should include both enhancing market transparency and efficiency, comply with the provisions of the law and clearly define the division of responsibilities among the different supervisory, regulatory, and executive authorities, and this principle has emphasized the following[1]:

- The governance structure should be developed taking into account its macroeconomic impact, market integrity, incentives it provides to market participants, and promoting market transparency and efficiency.
- The legal and regulatory requirements that affect the practice of corporate governance within the legislation should comply with the rules of the law, its transparency and commitment to its application.
- Legislation should clearly provide for the distribution of responsibilities among the different bodies while ensuring that the interests of the public are met.
- The supervisory and supervisory bodies responsible for the implementation of the law shall have the authority, integrity and resources to carry out their duties in a professional and objective manner.

Principle II: Ensuring the protection of shareholders' rights

According to this principle, the corporate governance framework should provide for the protection of shareholders' rights and shareholders' rights include[2]:

- Fundamental rights of shareholders such as securing the methods of registration of ownership, transfer or transfer of ownership and access to information about the company in a timely and regular manner.
- Shareholders have the right to participate and to obtain adequate information on decisions related to material changes in the company.
- It must be disclosed that there are any conditions for granting some shareholders rights in management that are not commensurate with the percentage of their contribution to the capital.
- Corporate Surveillance Markets Should Be Allowed to Operate Effectively and Transparently.
- Counter-acquisition mechanisms should not be used to immunize executive management against accountability.
- The market in which the company's shares are offered must be transparent and efficient.

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[1] - Ould mohamed, i, m., corporate covernance. a university publication addressed to second year masters studen, specializing in enterprise managment and economics. department of economics, department of economic science: university of mostaganem, 2013, p. 21.

[2] - Amjad, h, a., the impact of applying governance mrchanisms and pillars in commercial banks of rationalizing descision to grant credit and securitization of debts. scientific journal of economics and trade, 2012, p. 619- 620.

- Shareholders, including institutional investors, should consider the costs and benefits of exercising their voting rights.

Principle III: Equal Treatment of Shareholders

Corporate governance rules include equal treatment of shareholders of the same category, including minority and foreign shareholders, and all shareholders should have the opportunity to receive effective compensation in case of violation of their rights. This principle has emphasized[1]:

- Provide equal voting rights to shareholders within each class, and they have the right to obtain information on voting rights associated with all classes of shares before purchasing them.
- Changes in voting rights that adversely affect certain categories of shareholders are subject to their approval.
- Voting by trustees or commissioners in a manner agreed upon with the shareholders.
- The procedures followed for holding the general assembly meetings should allow the shareholders to be treated equally for all shareholders, and the company should avoid difficulties and high voting costs.
- Prohibiting the trading of shares in a manner that does not contribute to disclosure and transparency, and prohibits trading or access to the account of insiders.
- The members of the Board of Directors and executive directors must disclose the existence of any interests of their own that may relate to operations or matters affecting the company.

Principle IV: the role of stakeholders in the methods of exercising management powers in the institution

It includes respect for their legal rights, compensation for any violation of those rights, as well as mechanisms for their effective participation in the control of the institution, and their access to the required information, and stakeholders mean banks, employees, bondholders, suppliers and customers[2].

Principle V: Disclosure and Transparency

The principle of disclosure and transparency is one of the most important principles and foundations on which the governance system is based, as this principle is considered the cornerstone of the elements of successful governance, due to the role that commitment to this principle plays in providing the information needed by shareholders, investors and external bodies, on the basis of which they make their decisions[3].

*** Sixth Principle VI: Responsibilities of the Board of Directors**

It includes the structure and statutory duties of the Board of Directors, how its members are selected and its core functions, and its role in overseeing executive management[4].

This can be further illustrated by the following figure:

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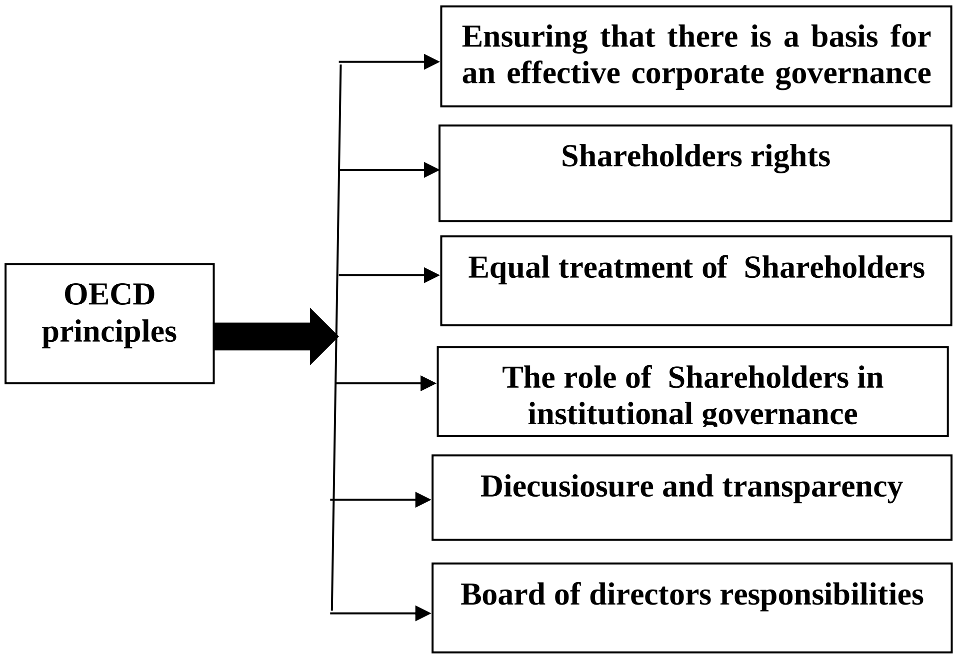
1 - kebli, N., the role of governance principles activating the financial performance of insurance companies. phd thesis. department of economic science, chelef: hassiba ben bouali, 2017, p. 20.

2 - Mohamed, h. y., determinants and standareds of governance with special reference to the pattern of governance in egypt. Retrieved from http://www.saaid.net/Doat/hasn/hawkama.doc, p. 35.

3 - mohamed, i. m., governance of companies listed in the stock market. contemporary egypt magazin, 2009, p. 176.

4 - Mohamed, h.y, Op.cit, p. 40.

Figure 01: Principles of Corporate Governance by the Organization for Economic Co-operation and Development (OECD)



Source: Prepared by the researchers.

4. Governance Indicators:

Thanks to the efforts of Kaufman and his colleagues, the World Bank produced a composite index compiled from sub-indicators produced by 31 competent bodies in this field, this indicator was called the Global Indicators of Governance (Indicators Worldwide Governance) or WGI, and this indicator also contains six sub-indicators, each of which measures a topic or dimension of good governance, these indicators are as follows[1]:

Control of Corruption (CC): This index measures the extent to which public power can limit small and large personal gains, as well as limit the control of elites and personal interests over governance.

Government Effectiveness Index (GE: This index measures the duration of the quality of public services, the quality of civil services, the degree of independence of government action from political pressures, the quality and implementation of regulations, and the credibility of government commitment to these regulations.

Political Stability and Absent of Violence (PS): This index measures the likelihood of government destabilization, an illegitimate coup, or the use of violence, including violence of a political and terrorist nature.

Regulatory Quality Index (RQ): Expresses the extent to which a government is able to formulate and implement effective policies and regulations that support development in the private sector.

Rule of Law Index (RL): measures the extent to which customers trust that the law is applied by the government equally to all individuals and organizations, especially

[1] - Bassam, a. a., good governence:saudi arabia case study. academy for social studies and humanities, 11, 2004, p. 12-_13.

confidence in the extent to which contracts are enforced, property rights are protected, police and court work, as well as the likelihood of crime and violence.

Voice and Accountability Index (VA): The Participation and Accountability Index measures the ability of a country's citizens to participate in the election of their government, as well as freedom of expression, association, and freedom of the media.

Second: The impact of governance on economic growth

1. The concept of economic growth:

Economic growth is defined as an increase in GDP or gross national income with an increase in real per capita income, growth must be reflected in the level of real income per capita[1]. It can also be defined as the expansion of the state's capabilities in producing the goods and services that society wants[2]. The economist François Perroux defined it as the continuous increase in gross or net income in real terms[3].

2. The impact of governance determinants on economic growth:

Determinants of governance play an important role and a strong impact on economic growth, determined by the following elements[4]:

Opinion and accountability: This indicator helps businessmen to criticize the wrong policies of a state, take positions when there is an imbalance in the economy and put restrictions on the boom of business, investment and economic growth.

Political stability: Problems in parties, coups, internal disputes... etc. are the main factors contributing to political instability, as they lead to increased risks in the economic environment in the country, resulting in a decline in foreign and domestic investment, and thus a decline in the rate of economic growth.

Government effectiveness: means the government's ability to create, organize and implement the right policies, and this can only be achieved with a highly efficient administrative system, and this system must have the skills to enable it to conduct the affairs of the state and find transparent mechanisms in various fields, and not to be affected by political pressures. True governance encourages business innovators to innovate new economic events and activities that contribute to economic growth.

Quality of organization: Within the framework of the views and ideas of the modern classical school, the decisions of managers and innovators in the private sector have become the cornerstone in the business environment, which leads to high economic growth, but in practice we find that the institutions that govern society have a strong impact on the costs and benefits of economic activities, and the correct laws and instructions that support and stimulate competition and efficiency are among the most important issues.that affect the economic performance of societies.

Rule of law: This indicator reflects the level of respect of citizens and businessmen in a country for legal institutions that work to resolve disputes in society, and the law cannot govern society without the following conditions: protecting individuals from acts of theft and cruelty, holding statesmen accountable when they carry out actions

[1] - attia, a, m, a., economitrics between theory and practice. al exandaria: university house, 2000, p. 51.
[2] - Rajan, m., impact of economic reforms on economic isuues: a study of ithiopia. african devlopment bank, 2005, p. 141.
[3] - Pierre, R., Croissance et crise (Analyse économique et historique), chapitre I : La croissance, présentation d'un processus complexe. France: Pearson, 2010, p. 02.
[4] - ahmad, j. m., the availability of governance indicators and their impact on economic growth in iraq. (u. o. basra, Ed.) journal of gulf economics, 19, 2011, p. 9-_12.

that lead to imbalances in economic and non-economic activities and a judicial system capable of resolving disputes quickly and efficiently.

Anti-corruption: Corruption means taking advantage of public power and exploiting it in order to achieve personal benefits that will harm society, and the spread of the phenomenon of corruption results in the unfair distribution of natural resources, and the distance of qualified individuals from creativity and innovation in business, and corruption creates an environment that enables some businessmen to benefit from suspicious private relationships of administrative decision makers and benefit from government support to achieve personal benefit.

Third: An econometric model of the impact of Kaufman's governance indicators on economic growth in Algeria during the period 2000-2023

Through this applied part of the study of the impact of governance determinants on economic growth in Algeria, we will try to use a modern methodology to test cointegration, and this is in line with recent trends in time series analysis, which is the autoregressive model for slowing time gaps (ARDL), where this method allows determining the complementary relationship between the dependent variable and the independent variables in the same equation. Annual data were relied upon during the study period 2000-2023, where these data were obtained from the Global Governance Indicators and the World Bank database.

1. Characterization of study variables and model building:

This study is based on the standard analysis method, as the identification of the standard model is one of the most important stages in the standard study, as it requires the identification of the variables included in the model and we have used governance indicators for Kaufman (VA, CC, RQ, RL, PS, GEA), highlighting the time course from (2000-2023) (www.wordbank.org) and trying to measure its impact on the economic growth of Algeria GDP using the ARDL method, which is designed to give an optimal estimate of the declines of cointegration, where the study model will be adopted as follow:

$$\mathbf{GDP} = f\,(\mathbf{VA}, \mathbf{PS}, \mathbf{GE}, \mathbf{RQ}, \mathbf{RL}, \mathbf{CC})$$

$$\mathbf{GDP} = \beta_0 + \beta_1\,\mathbf{VA} + \beta_2\,\mathbf{PS} + \beta_3\,\mathbf{GE} + \beta_4\,\mathbf{RQ} + \beta_5\,\mathbf{RL} + \beta_6\,\mathbf{CC} + \varepsilon t$$

Whereas:

*** Dependent variable:**

GDP: Gross domestic product (economic growth) in Algeria Economic growth

* **Independent variables:**

VA: Voice and Accountability Index

PS: Political Stability Index

GE: Government Effectiveness Index

RQ: Regulatory Quality Index

RL: Rule of Law Index

CC: Control of Corruption Index

ε_t**:** Random variable

The standard form of the *ARDL* model can be described by the following equation, which includes the short-term and long-term equations[1]**.**

[1] - Pesaran, M., Shin Yongcheol, R., & Smith, J., Bounds Testing Approaches To The analysis Of Level Relationships. Journal Of Applied Econometrics, 16(3),2001, p. 289 –326.

$$\Delta GDP_t = \vartheta + \sum_{K=1}^{P_1} \vartheta_k \Delta(GEA)_{t-k} + \sum_{K=1}^{P_2} \vartheta_k \Delta(PS)_{t-k} + \sum_{K=1}^{P_3} \vartheta_k \Delta(RL)_{t-k} + \sum_{K=1}^{P_4} \vartheta_k \Delta(RQ)_{t-k} + \sum_{K=1}^{P_5} \vartheta_k \Delta(CC)_{t-k} + \sum_{K=1}^{P_6} \vartheta_k \Delta(VA)_{t-k} + \lambda_1(GEA)_{t-1} + \lambda_2(PS)_{t-1} + \lambda_3(RL)_{t-1} + \lambda_4(RQ)_{t-1} + \lambda_5(CC)_{t-1} + \lambda_6(VA)_{t-1}$$

2. Stationarity test and time series

The stationarity of time series means that the relative stationarity of variance and arithmetic mean, that relative stationarity of variance and arithmetic mean[1] and the stationarity of series is a necessary condition for modeling very much to avoid false regression[2] Based on the choice of PP (Philips Perron) that corresponds to the series with few views[3], which was developed based on the Augment Dicky Fuller test (1998), which is based on the following equation:

$$\Delta y_5 = \alpha + \int y_{t-1} + e_t$$

Where the ARDL model requires that the model is free of static variables of grade I(2)[4] and the results of the selection (PP) are clear according to the following table.

Table 1: Unit root test for series model variable using pp

	At Level							
		GDP	VA	PS	GE	RQ	RL	CC
With Constant	t-Statistic	-2.0837	-2.8215	-2.1558	-2.0305	-0.9017	-1.7001	-1.7902
	Prob.	***0.1385***	***0.0683***	***0.2264***	***0.2726***	***0.7691***	***0.4179***	***0.3756***
With Constant & Trend	t-Statistic	-2.7052	-2.4507	-2.5456	-1.6945	-1.7341	-2.7181	-1.3845
	Prob.	***0.1253***	***0.3345***	***0.3055***	***0.7208***	***0.7028***	***0.2389***	***0.8382***
Without Constant & Trend	t-Statistic	-0.2796	0.2487	0.8314	-0.2153	-1.1758	-0.3997	0.0470
	Prob.	***0.5619***	***0.7481***	***0.8841***	***0.5977***	***0.2116***	***0.5285***	***0.6877***
	At First Difference							
		d(GDP)	d(VA)	d(PS)	d(GE)	d(RQ)	d(RL)	d(CC)
With Constant	t-Statistic	-7.7452	-4.2512	-4.6797	-4.9792	-3.9682	-4.3166	-4.0620
	Prob.	***0.0000***	***0.0000***	***0.0013***	***0.0007***	***0.0064***	***0.0030***	***0.0052***
With Constant & Trend	t-Statistic	-9.6940	-4.2908	-4.8888	-11.9344	-3.8694	-4.1927	-4.7861
	Prob.	***0.0000***	***0.0121***	***0.0039***	***0.0000***	***0.0317***	***0.0166***	***0.0049***
Without Constant & Trend	t-Statistic	-6.6275	-4.1645	-4.6913	-5.1206	-3.9875	-4.4138	-4.1489
	Prob.	***0.0000***	***0.0001***	***0.0001***	***0.0000***	***0.0004***	***0.0001***	***0.0002***

Source: Prepared by researchers based on the outputs of EVIEWS12

1 - William H, G., Econometric Analysis. New York university,, 2012, p. 709.
2 - Carter, R., & and others., principles of Econometrics . USA: John wiley and sons, 2007, p. 325.
3 - Hamilton, J., Time Series Analysis . Princeton University Pres, 1994, p. 528-529.
4 - Pesaran, M., Shin, H., & . and Smith, y., Bounds Testing Approaches to the Analysis of Level Relationships. Journal of Applied Econometrics, 16. Retrieved from https://rb.gy/cxozqe, 2001, p. 290.

The outputs of (eviews12) show that the p-values of the time series at the level are greater than the level of significance $sigi > 5\%$,While at the first level is below the level of morality, and therefore the chains are stable of the first order, and we write:

GDP (1), VA(I), PS (1), GEA (1), RQ (1), RL (1), CC (1)

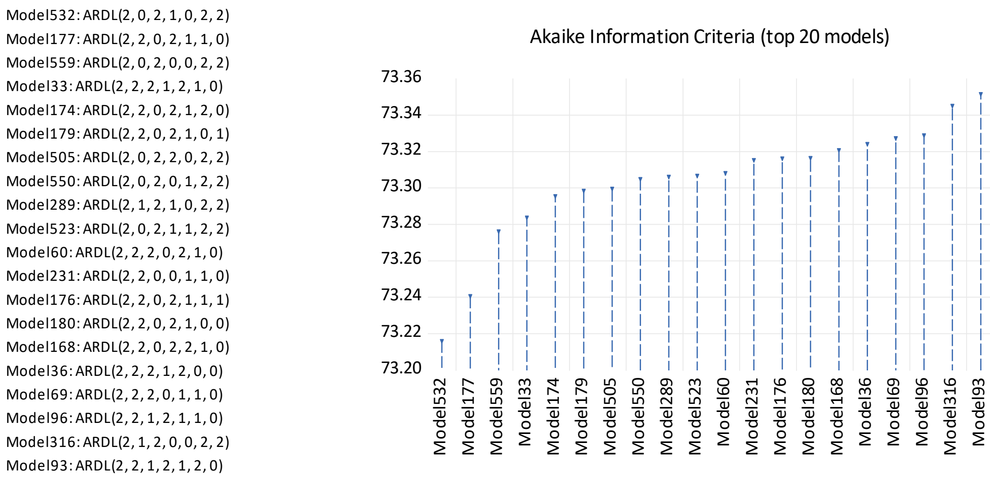
3. Choosing the optimal slowdown period for changes included in the ARDL estimate

The choice of cointegration according to the ARDL methodology requires determining the optimal deceleration intervals for the variables included in the model, according to the AIC standard, using the unrestricted autoregressive vector, based on the following relationship:

$$\mathrm{AiC_p} = \mathrm{Ln}\left[\det\left(\sum \mathrm{e}\right)\right] + \frac{2\mathrm{k}^2\mathrm{p}}{\mathrm{T}}$$

$\sum$ **e:** Matrix variance or variance purchased ability.
K: The number of variables in the model.
T: number of views.
P: number of periods of slowdown.
Using (Eviews), the outputs of the slowdown periods are shown as follows:

Figure 02: Testing of optimal slowdown intervals according to AIC.



Source: Prepared by researchers based on the outputs of EVIEWS12

It is seen from the figure that the optimal decelerations according to the (AIC) standard reached two delays, and the optimal model is (2,0,2,1,0,2,2) ARDL.

4. cointegration testing through ARDL Bounds Tests

The Bound test is based on Fisher's (F) statistic which is calculated according to the following relationship:[1].

$$F = \frac{(SSer - SSeu)/M}{SSeu/(n-k)}$$

SSer: The sum of the squares of the remainders of the restricted model.
SSeu: sum of the squares of the remainders of the unrestricted model.
M: Parameters of the constrained model.

[1] - Diebold, F., Econometrics (1 ed.). USA: University of Pennsylvania, 2016, p. 43.

K: Number of variables.
n: variable size.
The parameters of the Bound Test are shown in the following table.
Table 2: ARDL Bounds Test

F-Bounds Test		NullHypothesis: No levelsrelationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.598569	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99
ActualSample Size	22		FiniteSample: n=35	
		10%	2.254	3.388
		5%	2.685	3.96
		1%	3.713	5.326
			FiniteSample: n=30	
		10%	2.334	3.515
		5%	2.794	4.148
		1%	3.976	5.691

Source: Prepared by researchers based on the outputs of EVIEWS12

The table shows that (F = 4.59), which is above the upper critical value of (F = 3.96) at a significant level (5%), which shows the existence of a cointegration between (GDP) and (VA, PS, GE, RQ, RL, CC).).

5. Estimating the model ARDL

After selecting the cointegration according to the (**Bound Test**) methodology, the results of estimating the long-term parameters are shown according to the following table:

Table 3: Estimation of ARDL model (long term)

Levels Equation Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GEA	-1.17E+14	1.46E+14	-0.801707	0.4533
PS	1.02E+15	2.05E+14	4.972138	0.0025
RL	2.95E+14	2.06E+14	1.432088	0.2021
RQ	-4.27E+14	5.39E+13	-7.915372	0.0002
CC	7.64E+14	1.68E+14	4.540215	0.0039
VA	1.87E+14	2.29E+14	0.818027	0.4446
C	-2.51E+16	9.33E+15	-2.695595	0.0358
R^2=91 % prof= 0.000 dw=198				

Source: Prepared by researchers based on the outputs of EVIEWS12

The outputs show that there is a non-significant relationship between (VA, RL, GEA) and (GDP) in the long term, where $Pr_i > 0.05$, while the outputs recorded a significant relationship for the other parameters, where (GDP) responds directly to both (VA, PS), while it will be calculated inversely (RQ), and the model as a whole defines a total validity.

6. Estimation of Error Correction model (ECM) for (ARDL

After estimating the long-term relationship, the short-term results are illustrated by the following table.

Table 4: ECM (short-term) error correction model estimates

ARDL Error Correction Regression				
Dependent Variable: D(GDP)				
Selected Model: ARDL(2, 0, 2, 1, 0, 2, 2)				
Case 2: Restricted Constant and No Trend				
Date: 02/14/24 Time: 00:55				
Sample: 2000 2023				
Included observations: 22				
ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	0.655841	0.136041	4.820890	0.0029
D(PS)	7.56E+14	1.41E+14	0.000000	0.0000
D(PS(-1))	-6.02E+14	1.38E+14	0.000000	0.0000
D(RL)	7.51E+14	1.15E+14	0.000000	0.0000
D(CC)	1.12E+15	1.77E+14	0.000000	0.0000
D(CC(-1))	-1.26E+15	2.43E+14	0.000000	0.0000
D(VA)	6.57E+14	2.29E+14	0.000000	0.0000
D(VA(-1))	5.38E+14	1.70E+14	0.000000	0.0000
CointEq(-1)*	-1.793117	0.200843	-8.927963	0.0001
R-squared	0.915642	Meandependent var		6.07E+14
Adjusted R-squared	0.863730	S.D. dependent var		3.26E+15
S.E. of regression	1.20E+15	Akaike info criterion		72.57957
Sumsquaredresid	1.89E+31	Schwarz criterion		73.02590
Log likelihood	-789.3753	Hannan-Quinn criter.		72.68471
Durbin-Watson stat	1.985525			

Source: Prepared by researchers based on the outputs of EVIEWS12

The table shows that there is a significant relationship between the independent variables and the dependent variable, where the model excluded in the short term the variables (RQ, GE), while the relationship recorded a significant and direct significance for each of the variables (Va, CC, RL, PS) and recorded an inverse relationship for the variables (CC, PS). With one delay, the error correction coefficient was significant, with a negative value (ECM = -1.79), indicating a long-term return of 7 months at most.

7. Diagnostic tests for model quality

7.1 Autocorrelation test: The results of autocorrelation by BG, LM are as follows:

Table 5: LM test

Breusch-Godfrey Serial Correlation LM Test:			
Nullhypothesis: No serial correlation at up to 2 lags			
F-statistic	0.195488	Prob. F(2,4)	0.8298
Obs*R-squared	1.958893	Prob. Chi-Square(2)	0.3755

Source: Prepared by researchers based on the outputs of EVIEWS12

The model is devoid of autocorrelation where: $0.05 < (Prof = 0.82)$ Accordingly we accept H_0 That is, there is no autocorrelation for the remainder of the model series

7.2 autoregressive conditional nonstationarity test (ARCH): The results are as follows:

Table 6: ARCH test

Heteroskedasticity Test: ARCH			
F-statistic	1.393997	Prob. F(1,19)	0.2523
Obs*R-squared	1.435419	Prob. Chi-Square(1)	0.2309

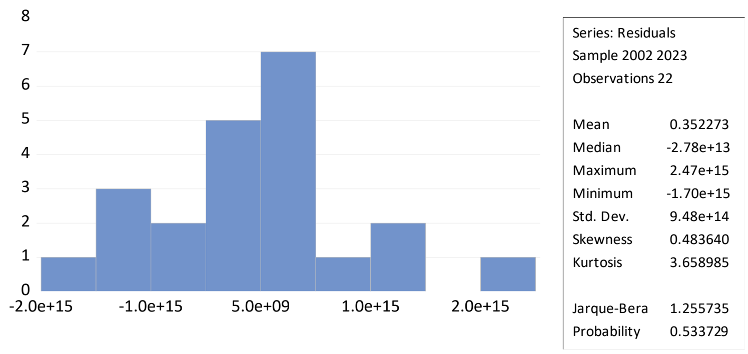
Source: Prepared by researchers based on the outputs of EVIEWS12

The table shows that the variance of the random error limit is invariable, where the value of Fisher (F = 1.39) is recorded with a p-value $0.05 < (ProF = 0.25)$

7.3. Test of moderation of the normal distribution of random errors:

Using the JB, the results are illustrated by the following figure:

Figure nº 5: Test of moderation of the normal distribution of random errors



Source: Prepared by researchers based on the outputs of EVIEWS12

It turns out that the random errors of the model follow the normal distribution where the value of (JB=1.25) for the value of $5\% < \left(\mathrm{Pro}_{\mathrm{JB}} = 0.53\right)$.

7.4 choosing the fit of the function shape (RAMSEY)

The table below shows that (F = 0.04) with a p-value $0.05 < (\mathrm{Pro}f = 0.83)$ Which is what we need to accept H_0 which means that the linear shape of the model is appropriate.

Table 7: RAMSEY Test

Ramsey RESET Test		

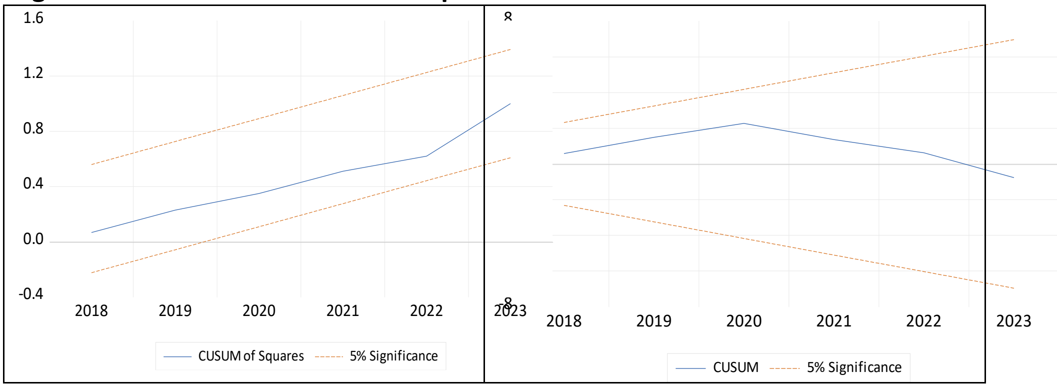
Equation: UNTITLED				
Omitted Variables: Squares of fitted values				
Specification: GDP GDP(-1) GDP(-2) GEA PS PS(-1) PS(-2) RL RL(-1) RQ				
CC CC(-1) CC(-2) VA VA(-1) VA(-2) C				
	Value	Df	Probability	
t-statistic	0.219846	5	0.8347	
F-statistic	0.048332	(1, 5)	0.8347	
Likelihood ratio	0.211640	1	0.6455	

Source: Prepared by researchers based on the outputs of EVIEWS12

7.5 structural stationarity test of the model:

The ARDL model estimation requires a structural stationarity test of the model parameters in the long and short term, which indicate that the data are free of structural variables, and the results are as follows:

Figure nº 6: cusum and cusum of square test



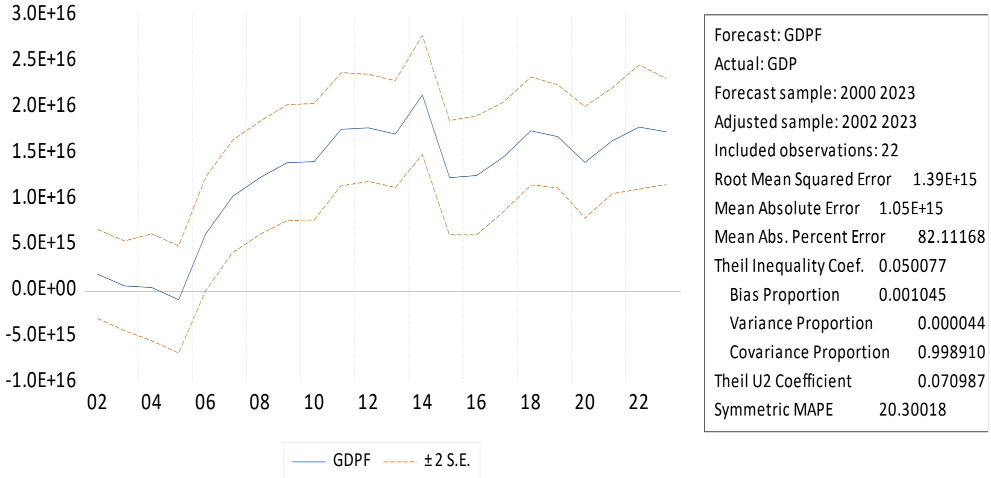
Source: Prepared by researchers based on the outputs of EVIEWS12

The figure shows that the cumulative sum statistic of residuals (**Cusum**) falls within the critical limits of the model, at **the 95% confidence** level, which indicates the stationarity of the estimated parameters of the unrestricted model (UECM), as well as the statistic of the cumulative sum of squares of residues within the critical limits of 5%.

7.6 predictive performance testing of the unrestricted error correction model:

After estimating ARDL and testing Cusumsq, Ousum is based on the Theil index to test the predictability of the estimated model. The results are illustrated in the following figure.

Figure nº 7: Predictive Performance Test



Source: Prepared by researchers based on the outputs of EVIEWS12

It was shown from the above figure that the Tile coefficient $1 > (\mathrm{T} = 0.05)$, has reached all

$$\mathrm{CC} = 0.99 \simeq 1 \qquad \begin{cases} \mathrm{BP} = 0.001 \simeq 0 \\ \mathrm{VP} = 0.004 \simeq 0 \end{cases}$$

Which obliges us to say that the model has the ability to predict.

8. Interpretation of the results of the study:

- The economic growth in Algeria for the period 2000-2023 did not respond as expected to the Kaufman indicators, as the impact was exclusively for (PS), (VA) (RQ) ratios: $1.02*10^{15}$, $1.87*10.^{14}$, -4.27*1014, long-term respectively.
- The combination (RQ. GE) recorded the desired effect in improving the growth index, while the indicators (VA.RL.PS.CC) recorded a very acceptable effect in the ratios $1.12 * 10^{15,}$ $7.56 *10^{14}$, $7.51 *10^{14}$, $6.57 *10^{14}$ respectively in the short term, which are significant ratios compared to those indicated in the long term.
- The estimated model restores equilibrium after a period of 7 months, which is a very significant period, where the error correction coefficient (ECM = -1.79) was recorded, which is significant at the confidence level of 95%, where the p-value (pro=0.0001).
- The indices (CC and PS) recorded an inverse relationship with a significant impact ratio that discouraged the growth of the growth index in the short term, and the RQ index also recorded an inverse relationship and the growth index by a very significant percentage in the long term.

conclusion:

Through this study, we tried to highlight the effective role played by governance in its various indicators, according to Kaufman, in influencing the economic growth rates in Algeria, but despite the efforts made by the Algerian state, especially in the last two decades (the subject of the study period) to develop governance policy and work to apply and activate its principles in accordance with the items stipulated in international bodies and organizations, it did not achieve the desired goals in raising growth levels. The quality of public services (GEA) recorded any interaction in further improving the growth index, considering that the public services provided did not live up to the desired level, and in terms of the lack of independence from the government as well as domestic and foreign political pressures, and the rule of law index (RL)) is also absent from the interaction within the growth model, due to the absence of transparent and fair application of the law in front of the segments of society equally, and on the other hand the absence of the impact of the corruption control index (CC), on the composition of the variables included in the model, which suggests the lack of control over corruption in its forms, The indicators that were effective in influencing, the exclusive combination formed the quality of legislation (RQ() which had an adverse impact on the growth of the economic growth index during the study period, as well as the political stability index (PS), which had a positive impact due to the political stability that affected the country during two decades, and on the other hand, the participation index (VA)) recorded a positive relationship that was found acceptable in influencing the improvement of the growth index, due to the spread of parliamentary accountability, and the recording of an improvement in the indicators of transparency and the spread of freedom and media freedom.

Among the recommendations and suggestions are:

- The need to work on reforming the economic, political and legal system to reach a positive impact of governance indicators.
- The need for Algeria to adopt measures and procedures to increase the pace of economic growth.
- In order to embody good and effective governance, Algeria must benefit from the leading countries in this field.
- Algeria must reconsider and exert more efforts in policies to control governance indicators and thus drive economic growth.

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