The combination of spending, employment, investment in the tourism sector as a strategy to promote the development path in Algeria during the period (2000-2023)using the ARDL model

توليفة الإنفاق، العمالة، الإستثمار في القطاع السياحي كإستراتيجية لتعزيز المسار التنموي في الجزائر خلال الفترة (2000–2023) باستعمال نموذج ا نحدار الذاتي للفجوات الزمنية الموزعة ARDL

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Abstract: This study aims to highlight the role of the tourism sector in achieving economic growth by highlighting the combination of spending, employment, investment in the tourism sector as a strategy to enhance the development path in Algeria and in order to achieve the objectives of the study, we used the autoregressive methodology for distributed slowdown periods during the period 2000-2023

The results of the study concluded that investment spending in the tourism sector remains unable to achieve the desired public policy objectives, as it still did not rise to the ranks of spending in other sectors, where it recorded an inverse relationship in the long term, and that employment in the tourism sector, despite its lack of qualifications, that it has achieved a direct relationship with economic growth in the long term, and that the need to achieve desirable values in the domestic product obligatorily indicates the need for tourism training and rehabilitation, and then providing Tourism trends to attract tourism investment.

Keys words:**Tourism sector**, **Expenditures**, **Employment**, **Investment**, **ARDL**

JEL classification codes: C53; H50;E62;O11

ملخص:تهدف هذه الدراسة إلى إبراز دور قطاع السياحة في تحقيق النمو الاقتصادي من خلال إبراز الجمع بين الإنفاق والتشغيل والاستثمار في قطاع السياحة كإستراتيجية لتعزيز مسار التنمية في الجزائر ومن أجل تحقيق أهداف الدراسة استخدمنا المنهج الانحداري الذاتي لفترات التباطؤ الموزعة خلال الفترة 2000–2023،وخلصت نتائج الدراسة إلى أن الإنفاق الاستثماري في قطاع السياحة يظل عاجزا عن تحقيق أهداف السياسة العامة المرجوة، حيث لم يرتقي بعد إلى مصاف الإنفاق في القطاعات الأخرى، حيث سجل علاقة عكسية على المدى الطويل، وأن التشغيل في قطاع السياحة رغم افتقاره للمؤهلات إلا أنه حقق علاقة مباشرة مع النمو الاقتصادي على المدى الطويل، وأن الحاجة إلى تحقيق القيم المرغوبة في الناتج المحلي تشير بالضرورة إلى الحاجة إلى التدريب والتأهيل السياحي، ومن ثم توفير الاتجاهات السياحية لجذب الاستثمار السياحي

الكلمات المفتاحية:القطاع السياحي،الإنفاق،العمالة،ا ستثمار، نموذج ARDL

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1-Introduction

Tourism is one of the most vital and important sectors in our time. It plays a significant role in promoting cultural and social communication among peoples, allowing individuals to explore new cultures, experience diverse landscapes, and learn about the heritage of different countries. Tourism is an industry that fosters international understanding and cooperation, supports the economy, and generates new job opportunities. It also plays a crucial role in preserving and showcasing the cultural and historical heritage of various regions, as ancient monuments and historical sites attract tourists from around the world, contributing to their maintenance and restoration for future generations to enjoy.

Moreover, tourism contributes to the development of local communities and strengthens the local economy. Local residents benefit from tourism-related projects such as hotels, restaurants, and shops, which create jobs and increase their income. Tourists also support the local economy by purchasing locally made products and traditional handicrafts.

As for Algeria, the country relies heavily on oil revenues to fund its economic development. However, with recent fluctuations in global oil prices and their impact on the national economy, it has become essential to adopt a new economic strategy. There is a pressing need to seriously explore real alternatives to the rent-based economy in order to stimulate growth and boost economic development.

Problematic

Through the above, the features of the problem of our research emerge, which can be formulated as follows:

What is the impact of activating tourism vehicles (spending, employment, investment) as a mechanism to promote economic development in Algeria?

Importance of the study:

There is no doubt that the tourism sector plays a crucial role in driving economic development, as evidenced by the experiences of neighboring countries such as Morocco, Tunisia, and Egypt, which have achieved substantial revenues from this sector. The increase in foreign exchange earnings, economic growth, and job creation highlights the significance of tourism as both an economic and social catalyst. Therefore, studying tourism is essential to better understand its importance, identify the challenges it faces, and develop strategies to enhance and sustain its growth.

To comprehensively address the previously stated problem and cover all aspects of the topic, this study has been divided into three main sections. The first section provides a general overview of tourism, followed by an analysis of the current state of the tourism sector in Algeria. Lastly, we attempt to construct an econometric model to measure the impact of key tourism variables—such as spending, employment, and investment in the sector—on economic growth in Algeria during the period from 2000 to 2023.

2-Generalities about tourism:

Tourism is a vital and important industry that plays a big role in promoting economic development. Tourism acts as a catalyst for economic growth by increasing revenues and providing employment opportunities in the tourism sector and related sectors. It also contributes to stimulating investments, promoting trade and enhancing the country's competitiveness in the global arena.

2.1 Definition of tourism

The concept of tourism has been subject to various interpretations, influenced by the diversity of its contributors as well as the broad scope of its political, social, economic, and cultural implications. The term "tourism" first emerged in the early 19th century AD.

Hunziker and Krapf defined tourism as "a set of phenomena and relationships arising from the travel and temporary residence of individuals outside their usual place of residence, provided that the stay does not evolve into permanent residence and is not linked to any activity that generates regular or temporary income" (Norbert, 2005, p. 2).

The World Tourism Organization (WTO) described tourism as “the activities of people traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business, or other personal purposes” (WTO, 1995, p. 10).

Similarly, the United Nations Conference on Tourism and International Travel defined it as a "human social phenomenon involving the movement of individuals from their permanent place of residence to another location for a temporary duration ranging from at least twenty-four hours to no more than one year, for purposes such as leisure, health, or historical tourism." This form of tourism is classified into domestic and international tourism (Cherif Jilali, 2021, p. 224).

The Algerian Ministry of Tourism adopted the WTO’s definition, incorporating additional elements as outlined by the National Statistics Office (Diwan National Statistics Authority, 1991, p. 526), including:

- **Entry**: Any person crossing the national border and entering the country outside of a simple transit route is considered an entrant;
- **Traveler**: Any individual within the national territory, regardless of nationality, residence status, or purpose of visit, excluding those on brief excursions or cruises;
- **Visitor**: A person entering the country without engaging in any paid work;
- **Cruise Passenger**: An individual who remains on board their vessel throughout their stay in the country, entering and leaving national maritime boundaries on the same ship.

Based on the various definitions provided, tourism can be broadly understood as the movement of an individual or group of individuals outside

their usual place of residence for a period ranging from at least one night to no more than one year, for purposes including leisure, recreation, or other personal objectives.

The development of tourism has evolved through four distinct stages, which can be summarized as follows (Owainan and Bashi, 2012, p. 224):

- **The Stage of Ancient Civilizations**: Tourism during ancient times was closely linked to human movement in search of resources and means of livelihood (Nael and Mahmoud, 2003, p. 1). During this era, human activity was largely governed by the forces of nature (Essam, 2011, p. 126). Notably, in 776 BC, the Greeks organized group travel for events such as the Olympic Games, which led to the construction of inns and facilities to accommodate visiting delegations.
- **The Stage of the Middle Ages**: Spanning from the early 15th century to its end (Muhammad, 1996, p. 22), this period witnessed the flourishing of Islamic civilization with the development of cities such as Baghdad and Cordoba. In parallel, prominent European universities such as the Sorbonne in France and Oxford in England emerged. A key characteristic of this stage was the absence of formal laws regulating travel and movement between regions.
- **Tourism in the Modern Era**: This phase extended from the 16th to the 19th centuries and was marked by major scientific and geographical discoveries. For example, Australia was discovered in 1605 and New Zealand in 1769, contributing to the expansion of travel and exploration.
- **The Contemporary Phase**: Beginning in the 20th century, tourism underwent significant advancement, particularly after the Second World War. This growth was facilitated by improved global security, the development of efficient transportation systems, and a rise in living standards. As a result, the 20th century is often referred to as the "century of tourism."

2.2 Different types of tourism

Among the most important types of tourism, we find the following (Owainan and Bashi, 2012, p. 226):

- **Tourism by geographical region**: is divided into:

- Domestic tourism: It means the travel of the citizens of the country within the borders of their countries.

- Regional tourism: It is tourism in which tourists move between neighboring countries that form one tourist area such as the Arab countries

-Foreign tourism: It is the movement of tourists from one country to another for tourism, and this transition is temporary

- **Tourism by Goal:** Tourism is divided by goal:

Religious tourism: This type of tourism is represented by visiting religious sites in the world, and Mecca is considered one of the most famous religious sites in the world (Marwan, 1994, p. 13);

- Wellness tourism: It is the transition to therapeutic tourist places that contain natural elements

For the treatment of certain diseases (Marwan, 1994, p. 14);

- Ecotourism: It is tourism that aims to visit natural reserves and preserve cultural, environmental and natural tourism heritage, as these tourism resources are considered part of the environment

2.3 The importance of the tourism sector

Tourism plays a vital role in stimulating economic activity through several key mechanisms (Islam, 2023):

Income Generation and Job Creation: Tourism serves as a significant source of income in many countries. The arrival and stay of tourists in local areas necessitate a wide range of services and products provided by local enterprises, including hotels, restaurants, transportation services, shopping centers, and recreational activities. This surge in demand leads to the creation of numerous employment opportunities for the local population.

Encouragement of Investment and Infrastructure Development: The tourism sector requires well-developed infrastructure to accommodate and satisfy the needs of tourists. This necessity drives investment in essential infrastructure such as hotels, airports, roads, and tourist attractions. These investments, in turn, involve the employment of local labor and the use of local materials and services, thereby strengthening the local economy and enhancing the quality of life in local communities.

Revitalization of Related Sectors: Tourism significantly boosts related sectors such as the food industry, traditional crafts, commerce, and entertainment. Tourists often seek local products and handmade crafts as souvenirs, thereby increasing demand in these sectors and contributing to their growth and prosperity.

Promotion of Cultural Interaction and Exchange: Tourism offers a platform for cultural interaction between visitors and local communities. Tourists can engage in authentic experiences such as sampling traditional cuisine, exploring cultural heritage sites, and interacting with local residents. This cultural exchange fosters mutual understanding, tolerance, and appreciation among different cultures.

Increase in Tax Revenues: The tourism industry is a major contributor to government tax revenues. Services utilized by tourists—such as accommodation, dining, and shopping—are typically subject to taxation. These taxes help finance public infrastructure, essential services, and other development initiatives.

Support for Local Industries: Tourism promotes the growth of various local industries. For instance, tourists often purchase souvenirs and locally made goods, which supports traditional crafts, arts, and food production. This increased demand for local products boosts employment and stimulates production within these industries.

The importance of the tourism sector in Algeria can be highlighted through the following key aspects:

- **Economic Diversification**: Tourism represents a valuable opportunity to diversify Algeria's economic base and reduce its reliance on the oil and gas sector. By investing in Algeria's rich and varied tourism assets—such as its cultural heritage, historical landmarks, and natural landscapes—economic growth can be stimulated, and new employment opportunities can be created.
- **Promotion of Cultural Exchange**: Both domestic and international tourists serve as a bridge for cultural and experiential exchange. Tourism in Algeria can play a significant role in enhancing mutual understanding among different cultures and in deepening intercultural knowledge, thereby promoting peace and fostering peaceful coexistence.
- **Enhancing Tourism Reputation**: Prioritizing and promoting tourism in Algeria can contribute to building the country's image as an attractive tourist destination. When tourists have positive experiences, it strengthens Algeria's reputation and encourages more visitors, thus supporting the long-term sustainability and growth of the tourism industry.

3. The reality of the tourism sector in Algeria

The tourism sector in Algeria is a sector with great potential for development and growth. The country has rich and diverse tourism resources, attracting visitors from all over the world. Algeria is famous for its stunning landscapes, such as the vast desert, beautiful beaches and magnificent mountains. In addition, the country embraces a rich cultural history that is reflected in ancient monuments and historic cities. However, Algeria's tourism sector faces some challenges that must be seriously addressed.

3.1 Elements of the tourism sector in Algeria

Algeria holds a strategic position within both the Mediterranean basin and the African continent. It boasts a vast geographical area and possesses numerous natural, historical, cultural, and financial elements that distinguish it from other countries, positioning it as a competitive destination for attracting tourists. The most significant of these components are as follows (Marwa, 2023, p. 30):

- **Natural Components**

These refer to the diverse natural features that Algeria enjoys, which play a crucial role in attracting tourists. They include:

- **The Coastal Strip**: Algeria has a coastline that stretches over 1,200 km, characterized by elevated and rocky landscapes. This area includes unique tourist spots such as El Kala, Tigzirt, Sidi Fredj, and Ténès, among others.
- **Diverse Climate Zones**: The country benefits from a mild Mediterranean climate in the north, a semi-arid climate in the high plateau regions, and an arid desert climate in the south. This climatic diversity, coupled with the geographical extension from the coast to the desert, allows for year-round tourism activities of various types across different seasons.

- **Mineral Springs and Therapeutic Waters**: Algeria is rich in mineral spas and therapeutic hot springs, offering considerable tourism and wellness potential. According to a study conducted by the National Foundation for Tourism Studies, there are 202 mineral water sources in Algeria, most of which are located in the northern regions of the country (Tayeb, 2018, p. 95).
- **The Algerian Desert**: Spanning nearly 2 million square kilometers, the desert comprises vast rocky plateaus and stone plains, intersected by the Great Western Erg and the Great Eastern Erg—extensive sand dune regions that offer breathtaking desert landscapes (Marwa, 2023, p. 32).
- **The Atlas and Saharan Atlas Mountain Ranges**: These mountain chains present ideal opportunities for adventure, exploration, and hunting activities (Fallahi, 2002, p. 59).

- **Historical and cultural components**

Algeria is among the countries endowed with a rich diversity of tourist resources, the most notable of which are the sites classified by UNESCO as World Heritage Sites. These include: Timgad, Tipaza, Djémila (Sétif), Tassilin'Ajjer, Qal'at Bani Hammad, the M'zab Valley, and the Casbah of Algiers. In addition, Algeria has witnessed the succession of various civilizations throughout history, which has resulted in a rich cultural, historical, and religious heritage spread across most regions of the country. These historical stages include the Roman civilization, the Islamic civilization, and the colonial era, reflected in the numerous military sites, detention centers, and defensive trenches built by the colonizers.

Moreover, traditional squares and diverse cultural manifestations play a significant role in enhancing the image of Algerian tourism. Among these are traditional crafts such as pottery, jewelry and gold making, as well as carpet weaving and embroidery—all of which reflect the country's deep-rooted artistic and cultural identity (Said and Chenbi, 2018, p. 26).

- **Material and financial assets:**

It represents the physical components of infrastructure such as reception and transportation structures, airports, ports, railways and means of communication, as well as institutional capabilities based on the implementation of the tourism strategy.

- **Legislative and regulatory components**

The tourism sector in Algeria has benefited from numerous governmental efforts aimed at promoting, organizing, and structuring its development. These efforts have been embodied in the adoption of several legislative acts and institutional initiatives, which can be summarized as follows (Ministry of Tourism and Handicrafts, 2022):

- **Act No. 03-01 of February 17, 2003**, concerning the sustainable development of tourism, which sets the foundation for environmentally and economically sustainable tourism practices.
- **Act No. 03-03 of February 17, 2003**, regarding tourist expansion zones and designated tourist sites, aiming to regulate and promote the optimal use of tourist areas.
- **The establishment of the Ministry of Tourism and Handicrafts** through **Decree No. 63-474 of December 20, 1963**, which marked a significant institutional step in structuring the tourism sector.
- **The creation of the National Tourist Office (ONAT)** by **Decree No. 88-214 of October 31, 1988**, responsible for promoting Algeria as a tourist destination both domestically and internationally.
- **The establishment of the National Agency for Tourism Development (ANDT)** through **Executive Decree No. 98-70 of February 21, 1998**, tasked with facilitating and supporting tourism investment and development.
- **The creation of the National Institute for Tourism Studies** under **Executive Decree No. 98-94 of March 1998**, which plays a vital role in research, training, and strategic planning for the tourism industry.
- **The formation of the National Committee for the Facilitation of Tourism Activities**, established by **Executive Decree No. 94-39 of February 25, 1994**, aimed at coordinating efforts among different stakeholders to ease tourism-related procedures and services.
- **Implementation of economic and financial measures** tied to the **Tourism Development Master Plan (SDAT 2025)**, designed to support investment and encourage sustainable growth in the tourism sector.

3.2 The most important challenges of tourism in Algeria

Algeria, with its diverse landscapes and rich cultural heritage, is one of the prominent tourist destinations in North Africa. However, it faces several challenges in the tourism sector. Addressing these challenges through appropriate measures can significantly boost the tourism industry and attract more visitors. Both the government and the private sector must collaborate and invest in promoting and developing tourism. The key challenges facing tourism in Algeria are as follows (Rwaqat, 2023, p. 849):

- **Development Policy Issues**: Tourism has not been given the necessary attention as a vital sector for economic development. Issues such as tourism real estate and financing remain significant obstacles to growth.
- **Tourism Culture**: There is a significant lack of a tourism culture in Algerian society, along with certain negative perceptions about tourism. For instance, some segments of society are wary of interacting with tourists due to concerns about customs and traditions.

- **Security Stability**: Security concerns, especially stemming from the turbulent period of the 1990s, have led to a decline in tourism. While Algeria has made notable progress in restoring security and stability in recent years, tourism activity remains modest. It is crucial to capitalize on the current period of security to promote and expand the tourism sector.
- **Tourism Infrastructure**: There is a need to improve and expand Algeria's tourism infrastructure, including hotels, resorts, transportation, and tourist sites. Many tourist areas require enhanced services and facilities to meet the expectations of visitors.
- **Tourism Marketing and Promotion**: Algeria faces challenges in effectively marketing its tourism offerings to international audiences. There is a need for the government and tourism authorities to develop and implement successful marketing strategies to highlight the country's diverse attractions and draw more tourists.
- **Tourism Product Diversity**: Despite Algeria's natural and cultural wealth, there is a need to diversify the tourism products offered. Promoting a range of tourism sectors—such as cultural, historical, natural, sports, and health tourism—can help increase Algeria's appeal to potential tourists.
- **Visas and Administrative Procedures**: Administrative barriers, including complex visa processes and lengthy procedures, pose difficulties for some visitors. Simplifying these procedures would encourage more tourists to choose Algeria as their destination.

4.The econometric Study

This study is based on the standard analysis methodology, using the ARDL methodology that is designed to give estimation, as the relationship between the vehicles of the tourism sector and economic growth is estimated, where economic growth represents the dependent variable GDP while ext: spending in the tourism sector ext, tourism employment emt, for the period between 2000-2023

4.1 Model and study variables:

The Autoregressive Distributed Lag (ARDL) model, developed by Pesaran and Shim (1995) and further refined by Pesaran et al. (2001), integrates autoregressive models with distributed lag models, allowing for a more flexible approach in time series analysis. One of the key advantages of the ARDL model is that it does not require the variables to have the same degree of integration, meaning that the test can be applied regardless of whether the variables are stationary at level I(0), stationary at the first difference I(1), or a combination of both, as long as they are not integrated at I(2).

This study employs the ARDL methodology as a standard analysis tool to estimate the relationship between tourism sector indicators and economic growth. In this context, economic growth, represented by the GDP, is considered the dependent variable, while the key explanatory variables are tourism sector

spending (ext) and tourism employment (emt). The analysis covers the period from 2000 to 2023. The ARDL approach is particularly useful for this study because it allows for the estimation of both short-term and long-term relationships between these variables, while taking into account the dynamic interactions over time.

Based on the above presented from the standard analysis, the following study model will be adopted:

GDP = f (ext, emt)

GDP = $\beta_0 + \beta_1$ ext + $\beta_2$emt ε_t

Whereas:

Dependent variable:

gdp: Gross Domestic Product (Economic Growth) in Algeria Economic Growth

Independent variables:

Ext: Spending in the Tourism Sector

EMT: Tourism Labor

The ARDL model can be expressed in the following equation, which includes short- and long-term equations (Pesaran, Shin, & Smith J, Bounds Testing Approaches To The analysis Of Level Relationships, 2001). .

$$\Delta GDP_t = \vartheta + \sum_{K=1}^{P_1} \vartheta_k \Delta(ext)_{t-k} + \sum_{K=1}^{P_2} \vartheta_k \Delta(emt)_{t-k} + \lambda_1 (ext)_{t-1} + \lambda_2 (emt)_{t-1}$$

4.2 Testing stationnarityof time series

The stability of time series means that the relative stability of variance and arithmetic mean, that relative stability of variance and arithmetic mean (William, 2012), and series stability is a necessary condition for modeling that avoids pseudo-regression (Carter & al, 2007). Based on the PP selection (Philips Perron) that corresponds to the few observed series (Hamilton, 1994), developed based on the Augment Dick 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 class I (2) (Pesaran, Shin, & Smith, 2001) and the results of the selection of (PP) are clear according to the following table

Table 1: Testing the Root of the Module Variables Series Using the ADF

UNIT ROOT TEST RESULTS TABLE (ADF)				
Null Hypothesis: the variable has a unit root				
	At Level			
		GDP	EXT	EMT
With Constant	t-Statistic	-2.2050	-1.5207	-2.3861
	Prob.	0.2103	0.5029	0.1577
		N0	N0	N0
With Constant & Trend	t-Statistic	-2.7052	3.3470	-0.9047
	Prob.	0.2443	1.0000	0.9354

		N0	N0	N0
Without Constant & Trend	t-Statistic	-0.5904	-0.2071	0.1609
	Prob.	0.4494	0.5990	0.7221
		N0	N0	N0
	At First Difference			
		d(GDP)	d(EXT)	Dr. (EMT)
With Constant	t-Statistic	-6.4318	1.3025	-4.2996
	Prob.	0.0000	0.9971	0.0038
		***	N0	***
With Constant & Trend	t-Statistic	-6.4234	-0.5079	-4.9647
	Prob.	0.0002	0.9694	0.0048
		***	N0	***
Without Constant & Trend	t-Statistic	-6.4191	-1.8384	-4.3468
	Prob.	0.0000	0.0640	0.0002
		***	*	***

Source: Prepared by researchers based on the outputs of the Eviews12

Based on the outputs from **EViews12**, it is evident that the p-values of the time series related to tourism employment, spending in the tourism sector, and the national product at the level are greater than the significance level (p > 5%). This suggests that the variables are not stationary at the level. However, when the variables are differenced (i.e., at the first order), the p-values become significant and fall below the 5% significance threshold, indicating that the variables are stationary at the first difference (I(1)).

With this in mind, the next step is to test for the existence of a long-term relationship between the mentioned variables. To do so, we can use the **boundary approach for cointegration** based on the **ARDL methodology**. This method allows us to test for cointegration even when the variables are integrated of different orders (i.e., I(0) and I(1)). However, before conducting this test, it is crucial to select the optimal lag length for the variables in the model estimation. Once the appropriate lag structure is determined, the ARDL cointegration test can be performed to assess whether there is a stable long-term relationship between tourism employment, spending in the tourism sector, and the national product (GDP).

4o mini

3.3 Selection of the optimal slowdown period for changes in ARDL estimation

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

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

∑ eMatrix variance or variance purchased ability.

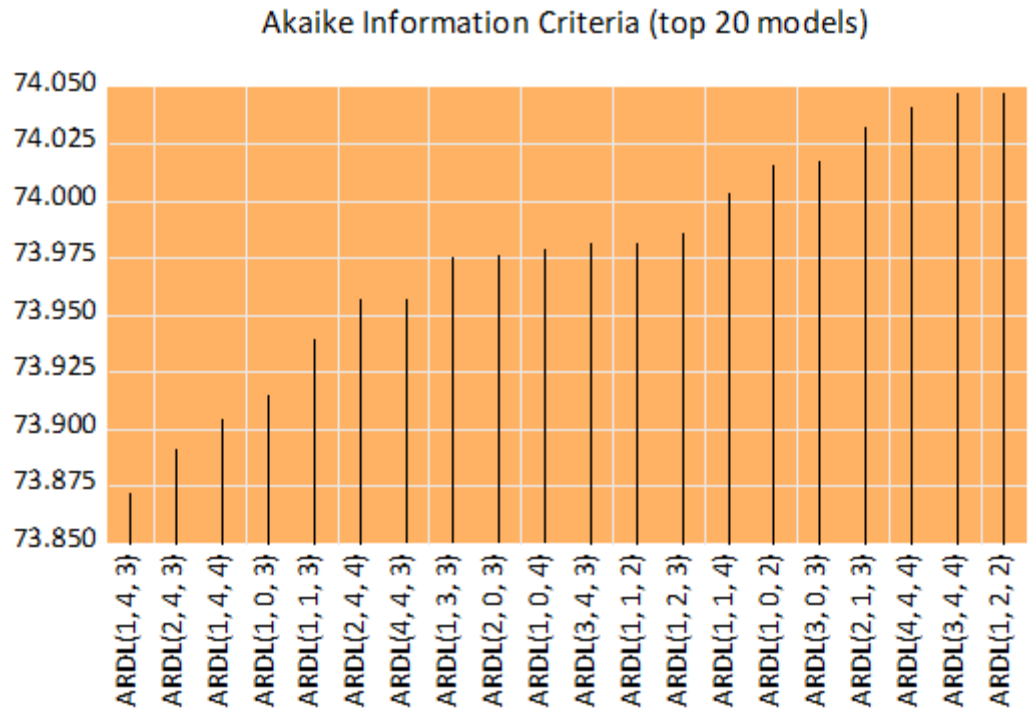
K: The number of variables in the model.

T: number of views.

P: number of periods of slowdown.

Using (eviews), the outputs of optimal slowdown periods are illustrated as follows:

Fig 1: Testing of optimal slowdown intervals according to AIC



Source: Prepared by researchers based on the outputs of the eviews 12

The ARDL autoregression methodology is based on determining the optimal number of slowdown periods for model variables, based on the lowest value of the informatics standard (AIC), as it is clear from the figure above that the best model chosen, which achieves the lowest value of the informatics standard (AIC) is the model (1,4,3) ARDL. .

3.4 Cointegration testing through ARDL Bounds Tests

The Bound test is based on Fisher's (F) statistic calculated according to the relationship (Diebold, 2016).

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

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.

K: Number of variables.

n: variable size.

The parameters of the Bound Test are shown through Table (05).

To confirm the cointegration or the existence of a long-term relationship between the variables of the study, we resort to the use of the bound test method, where we compare the statistics (F) with the upper and lower limits of: Pesaran, if the statistic (F) is greater than the upper limits We reject the null hypothesis and accept the alternative hypothesis that states the existence of a long-term

relationship or co-integration between the variables of the study. If the opposite is to accept the null hypothesis, which states that there is no co-integration between or a long-term relationship between the variables of the study, but if (F) is confined between the upper and lower limits of Pesaran, the results are inconclusive. The following table shows the test of the boundary approach as follows:

Table 5:ARDL Bounds Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.360805	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	20		Finite Sample: n=30	
		10 %	2.915	3.695
		5 %	3.538	4.428
		1 %	5.155	6.265

Source: Prepared by researchers based on the outputs of the eviews 12

The table shows that (F = 4.36), which exceeds the upper critical value of (F = 3.96) at a significant level (5%), which shows the existence of joint integration between the study variables (GDP) and (emt, Ext).).

5.3 Estimation of the model according to the autoregressive approach to slowed distributed time gaps

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

Table 6: Estimation of ARDL model variables (long term)

Levels Equation

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXT	-2.01E+14	7.96E+14	-0.252819	0.0061
EMT	4.30E+16	2.07E+16	2.075379	0.0078
C	-7.94E+15	7.82E+15	-1.016357	0.0360

EC = GDP - (-201264326369107.4063*EXT + 42999682949621856.0000 *EMT - 7944906911147627.0000)

Source: Prepared by researchers based on the outputs of the eviews 12

Through the table, it is clear that there is an inverse relationship between tourism spending and economic growth, and a significant significance was recorded at the confidence level of 95%, while employment in the tourism sector recorded a positive relationship with a significant significance, which indicates the need to inject financial envelopes to create an investment climate to enhance GDP.

3.6 Estimation of Error Correction Model (ECM) formula for Slowed Distributed Time Gap Self-Regression Model (ARDL).

Based on the table's outputs, we observe that the calculated t-statistics indicate that the parameters for **tourism sector expenditure** and **tourism employment** in the short-term model are statistically significant at the 5% significance level. This suggests that both variables have a meaningful impact on the dependent variable (economic growth or GDP) in the short term.

Regarding the **error correction coefficient (CointEq(-1))**, it is statistically significant and has a negative sign of **-0.874210**. The negative sign indicates that there is a mechanism for adjusting short-term deviations from long-term equilibrium. Specifically, the magnitude of **-0.874210** suggests that approximately **87%** of the short-term disequilibrium or errors are corrected each period, bringing the model closer to its long-term equilibrium.

Additionally, the **adjusted coefficient of determination (R-squared)** is 54%, meaning that the estimated model explains **54%** of the variation in the dependent variable (GDP). This is a relatively good fit, implying that while the model explains a substantial portion of the changes in economic growth, there are still other factors not captured by the model. Nonetheless, the results suggest that tourism sector expenditure and employment are significant contributors to economic growth in both the short and long term.

Table 7: ECM (short-term) error correction model estimates

ARDL Error Correction Regression					
Dependent Variable: D(GDP)					
Selected Model: ARDL(1, 4, 3)					
Case 2: Restricted Constant and No Trend					
Date: 03/06/24 Time: 23:37					
Sample: 2000 2023					
Included observations: 20					
ECM Regression					
Case 2: Restricted Constant and No Trend					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
D(EXT)	6.48E+14	3.38E+14	0.000000	0.0000	
D(EXT(-1))	8.04E+14	4.08E+14	0.000000	0.0000	
D(EXT(-2))	5.57E+14	3.74E+14	0.000000	0.0000	
D(EXT(-3))	1.14E+15	6.16E+14	0.000000	0.0000	
D(EMT)	-5.21E+15	1.07E+16	0.000000	0.0000	
D(EMT(-1))	-6.65E+16	1.63E+16	0.000000	0.0000	
D(EMT(-2))	-4.99E+16	1.76E+16	0.000000	0.0000	
CointEq(-1)*	-0.874210	0.181273	-4.822616	0.0009	
R-squared	0.711623	Mean dependent var		7.65E+14	
Adjusted R-squared	0.543403	S.D. dependent var		2.93E+15	
S.E. of regression	1.98E+15	Akaike info criterion		73.57219	
Sum squared resid	4.71E+31	Schwarz criterion		73.97049	
Log likelihood	-727.7219	Hannan-Quinn criter.		73.64994	
Durbin-Watson stat	2.346920				

Source: Prepared by researchers based on the outputs of the eviews 12

3.7 Diagnostic tests of model quality

- **Autocorrelation test:**

Through the table, the results of the calculated statistical value of Fisher for the serial correlation test for residues amounted to (0.54344) with a p-value of 0.6034, and therefore we accept the null hypothesis that the estimated model is free of the problem of serial correlation between residues.

Table 8: Breusch-Godfrey Serial Correlation LM Test

Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	0.543444	Prob. F(2,7)	0.6034
Obs*R-squared	2.688025	Prob. Chi-Square(2)	0.2608

Source: Prepared by researchers based on the outputs of the eviews 12

Through the above table, the results of the calculated statistical value of Fisher for the serial correlation test for residues amounted to (0.54344) with a p-value of 0.6034, and therefore we accept the null hypothesis that the estimated model is free of the problem of serial correlation between residues.

- **Autoregressive Conditional Variance Instability Test (ARCH):**

It is noted that the statistical value calculated for Fisher to test the instability of variance conditioned by autoregression was (0.724378) with a p-value of 0.4065, and therefore we accept the null hypothesis that the variance of the random error limit variance is constant in the estimated model.

Table 9: Heteroskedasticity Test: ARCH

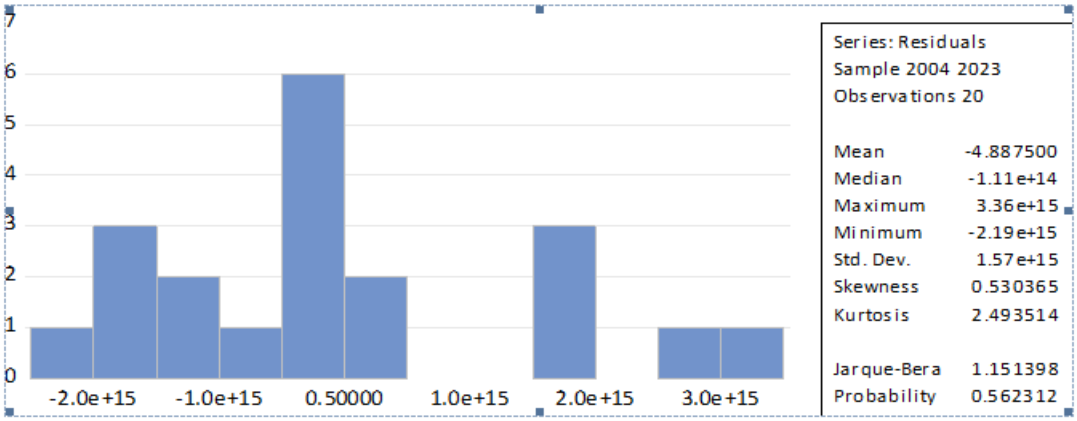
F-statistic	0.724378	Prob. F(1,17)	0.4065
Obs*R-squared	0.776511	Prob. Chi-Square(1)	0.3782

Source: Prepared by researchers based on the outputs of the eviews 12

- **Test the moderation of the normal distribution of random errors:**

It is noted that the statistical value calculated for Fisher to test the normal distribution of random errors was (1.151398) with a p-value of 0.562312, i.e. to verify that random errors are distributed normally in the estimated model.

fig 2:test of normality



Source: Prepared by researchers based on the outputs of the eviews 12

- **Ramsey test**

It is noted that the statistical value calculated for Fisher for the Ramsey-RESETY test was (1.242664) with a p-value of 0.2973, which means accepting the null hypothesis that the function used in the estimated model is correct.

Table 10: Ramsey RESET Test

Equation: UNTITLED			
Omitted Variables: Squares of fitted values			
Specification: GDP GDP(-1) EXT EXT(-1) EXT(-2) EXT(-3) EXT(-4) EMT EMT(-1) EMT(-2) EMT(-3) C			
	Value	Push	Probability
T-statistic	1.114748	8	0.2973
F-statistic	1.242664	(1, 8)	0.2973
Likelihood ratio	2.887771	1	0.0893

Source: Prepared by researchers based on the outputs of the eviews 12

- **Structural stability test of the model:**

The ARDL model estimation requires a structural stability 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:

Fig 3: CUSUM and CUSUM squares test



Source: Prepared by researchers based on the outputs of the Eviews 12

The results from the structural stability tests for the CUSUM (Cumulative Sum of Recursive Residuals) and CUSUMSQ (Cumulative Sum of Squares of Recursive Residuals) coefficients indicate that the model is structurally stable throughout the studied period. The stability of the model is confirmed by the fact

that there are no significant structural breaks or changes over time, as shown in the corresponding figures.

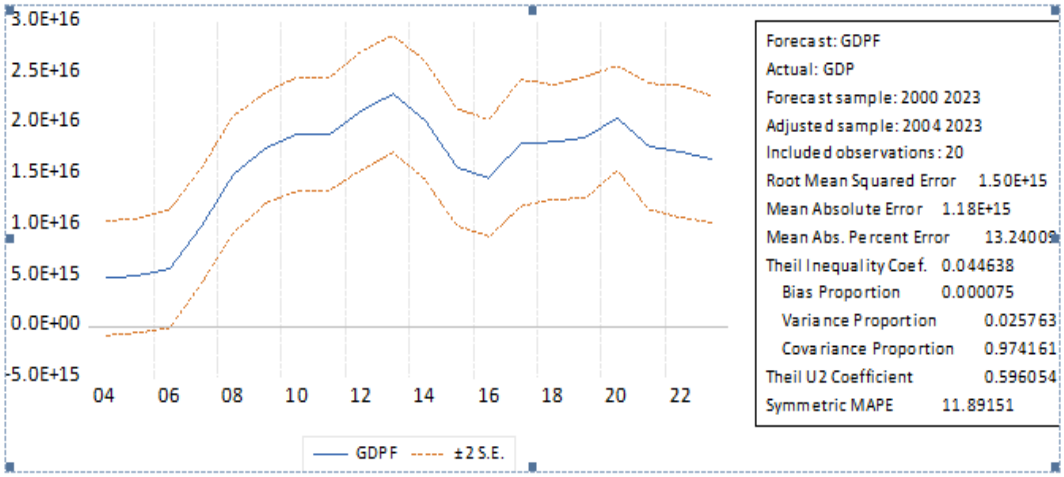
This stability suggests that the relationship between the national product (GDP) and the independent variables (such as tourism sector expenditure and employment) remains consistent across the time period analyzed. The findings imply that the model's dynamics, both in the short and long term, are harmonized and stable, and that the underlying functional relationship between the dependent and independent variables is stable.

Thus, we can conclude that the model reflects a stable functional relationship between the national product (as the target variable) and the key tourism-related variables. This stability provides confidence in the robustness and reliability of the model for understanding the impact of tourism on economic growth in Algeria.

3.6 Predictive performance test for the unrestricted error correction model:

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

Fig4: Predictive Performance Test



Source: Prepared by researchers based on the outputs of the eviews 12

The results presented in the figure indicate that the Theil inequality coefficient is 0.044638, which is very close to the ideal value of zero. This suggests that the model exhibits a low level of inequality and a relatively good fit, meaning that the model's predictions are not highly dispersed or biased.

Moreover, the covariance value of 0.974161 is very close to the ideal value, further supporting the model's accuracy and robustness. A high covariance indicates that the variables are strongly related and that the model can effectively capture the relationships between the variables.

Given these results, it can be concluded that the model is well-suited for explaining economic growth in Algeria. The model's high predictability implies that it can be effectively used to understand the dynamics driving the increase in the national product (GDP) during the study period. Therefore, this model

provides a reliable tool for analyzing and forecasting economic trends in Algeria, particularly in the context of tourism's impact on growth.

3.7 Interpretation of the results of the study:

The findings highlight several key insights related to the tourism sector's impact on economic growth in Algeria:

- **Investment Spending in the Tourism Sector:** Despite efforts to promote tourism, investment spending in the tourism sector has not yet achieved the desired outcomes in terms of public policy objectives. The level of investment in tourism remains below that of other sectors, and there is an inverse relationship between tourism investment and economic growth in the long term. This indicates that the current tourism investment strategies may not be as effective in driving growth, and more focused efforts are required to align investments with the sector's potential.
- **Tourism Employment:** Although tourism employment faces challenges due to insufficient qualifications, it has demonstrated a positive relationship with economic growth in the long term. This suggests that tourism-related employment contributes to overall economic development, albeit with the need for better training and qualification programs. The improvement in human capital in the tourism sector is critical for achieving the desired outcomes in the national product.
- **Training and Rehabilitation:** Given the positive role of tourism employment in economic growth, there is a clear need for tourism training and rehabilitation programs. These initiatives will not only improve the quality of the workforce but also create a more attractive environment for tourism investment, ultimately fostering sustainable growth in the sector.
- **Tourism Investment Model:** The model for tourism investment in relation to economic growth reveals that 87% of short-term errors are corrected over time, as the system naturally adjusts toward long-term equilibrium. This reflects the self-correcting nature of the relationship between tourism investment variables (such as spending and employment) and economic growth.
- **Automatic Balance:** The automatic balance between the tourism investment variables (tourism spending and tourism employment) occurs after approximately one and a half years, indicating that the system takes time to adjust to changes in the tourism sector and the broader economy.
- **Growth Response to Tourism Spending and Employment:** The growth index shows a positive and significant relationship with tourism spending up to the third lag (lag3), suggesting that the impact of tourism spending on growth is realized after a certain delay. On the other hand, tourism employment shows an inverse response to the second lag (lag2), which could imply that fluctuations in tourism employment might initially have a negative effect on growth but may recover in the long term.

In summary, while tourism plays a vital role in economic growth, there are several areas for improvement, including increasing investment in the sector, enhancing the qualifications of the workforce, and ensuring that tourism policies are more aligned with the sector's potential. Proper training and rehabilitation, as well as strategic investments, are essential to foster a more robust and sustainable tourism industry in Algeria.

4.Conclusion:

Tourism in Algeria holds great potential as an alternative economic pillar to the oil sector. However, it currently contributes only 4% of GDP, which is relatively low given the country's rich and diverse tourism resources. Algeria is home to a wealth of historical, cultural, and civilizational heritage, as well as unique natural landscapes. Throughout its history, many civilizations have left their mark on the country, creating a fascinating mosaic of historical and archaeological sites. Additionally, Algeria's vast desert region, with its ancient ruins, diverse wildlife, and rich traditions, offers considerable opportunities for tourism development. The northern part of the country is also a blend of historic Islamic architecture and modern European influences, adding further appeal to Algeria as a tourist destination.

Despite these advantages, the tourism sector has not yet reached its full potential. To unlock this potential and position tourism as a key driver of economic growth, the Algerian government must take several strategic steps. These include:

- **Developing an effective national tourism strategy**: A comprehensive national strategy is needed to effectively promote and develop the tourism sector. This strategy should focus on leveraging the country's rich cultural heritage and diverse natural landscapes while ensuring that tourism development aligns with sustainable practices.
- **Investing in tourism infrastructure**: To attract tourists and meet their needs, Algeria must invest in upgrading and expanding its tourism infrastructure. This includes improving transportation networks, building modern accommodations, and developing tourist attractions that highlight the country's unique cultural and natural assets.
- **Enhancing marketing and promotion**: Algeria must also improve its marketing efforts to raise awareness about its tourism potential. By effectively promoting the country's unique tourist destinations, Algeria can attract international tourists and position itself as a top tourist destination in North Africa.
- **Encouraging collaboration**: Achieving tourism development requires collaboration between the government, private sector, and local communities. Public-private partnerships can help pool resources and expertise to develop the tourism industry and ensure that its benefits are distributed across the local population.

- **Focusing on sustainability and cultural diversity**: It is essential to integrate sustainability into tourism planning and ensure that the development of tourism does not compromise Algeria's cultural and environmental integrity. By preserving Algeria's diverse cultural heritage and natural landscapes, the country can create a sustainable tourism industry that benefits both visitors and locals.

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