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A quantitative study of the impact of business climate on tourism investment in Algeria

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***Abstract*---**The study aimed to know the impact of the business climate on tourism investment in Algeria, based on some business climate indicators represented by the economic growth rate, economic freedom, human development index as independent variables and tourism investment represented by (the added value of the tourism sector) as a dependent variable during the period (1990-2020), using standard methods and building a standard model based on the autoregressive distributed lag (ARDL) model in order to know the relationship between business climate indicators and tourism investment in Algeria. The standard study concluded that there is a joint integration between business climate indicators and tourism investment in Algeria in the long and short term and a positive relationship between the two variables.

***Keywords*---**Tourism Investment, Economic Freedom, Ease of Doing Business, Economic Growth, Human Development.

Introduction

Investment is a key dynamic driver of development and the economy in any society. Most countries prioritize it, and tourism investment has emerged as one of the most significant forms of investment today due to its substantial revenue generation in various countries around the world.

Algeria has enacted a series of laws to regulate the tourism sector and has developed a strategy to enhance it, including the Tourism Development Master Plan (SDAT 2030). Algeria boasts abundant tourism resources and potential, which could position it as a leading tourist destination. The country aims to develop the tourism sector as an alternative to the hydrocarbons sector by creating a favorable business climate. However, the nature of the business climate in Algeria presents several challenges, such as issues with land, administrative corruption, bureaucracy, and a weak financial system.

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Study Problem:
Based on the above, the following research question arises:
To what extent does the business climate impact tourism investment in Algeria?

Study Hypotheses:

The following hypotheses were formulated:

- A long-term equilibrium connection exists between the business climate and tourism investment in Algeria, where business climate indicators positively impact tourism investment during the study period.
- Business climate indicators are the primary determinants of tourism investment in Algeria during the study period.

Study Objectives:

- To determine whether a causal relationship exists between the business climate and tourism investment in Algeria.
- To analyze the relationship between tourism investment and the business climate in Algeria.
- To determine how Algeria's economic environment affects investment in tourism.

Study Methodology:

The study requires a comprehensive understanding of the concepts related to the study variables, both theoretically and practically. This necessitates the use of a descriptive approach to cover all aspects related to the concepts of the business climate and tourism investment. Additionally, econometric and statistical methods were employed to analyze the impact of business climate indicators on tourism investment in Algeria during the period 1990–2020.

An Autoregressive Distributed Lag (ARDL) model was used, and appropriate software tools were utilized for data analysis. Specifically, the **EViews 10** software was employed to estimate and extract results and conduct the necessary tests.

1. Conceptual Framework for Tourism Investment and Business Climate

Tourism investment, like general investment, requires various arrangements and conditions that act as incentives to increase spending on tourism projects. The investment environment in the tourism sector plays a crucial role in developing these projects through different facilitations, such as providing necessary financing and offering various types of incentives.

1.1 The Nature of Tourism Investment

Tourism investment, like other types of investment, involves spending with the aim of generating future returns in various tourism-related fields. However, it has distinct characteristics that set it apart from other forms of investment.

1.2 Definition of Tourism Investment

Tourism investment refers to the productive capacity aimed at developing human and physical capital in the tourism sector, with the goal of increasing the tourism capacity of the destination country. A tourism investment project involves allocating financial resources to create infrastructure designed to meet the desires and needs of tourists (e.g., hotels, restaurants, recreational and leisure facilities, resorts, etc.) (Ben Nasser & Bouzraf, 2020, p. 217).

1.2.1 Characteristics of Tourism Investment

Tourism investments possess several unique characteristics, including:

- Long-term nature: Tourism investments are typically made in fixed assets with a lifespan of 20 to 25 years, which can lead to various social and political changes, each with varying levels of risk.
- Delayed returns: Due to the extended duration of such investments, the returns are not immediate.
- Project specificity: Tourism investments cannot be easily converted or adapted to other types of projects.
- Labor-intensive: These investments require a high level of employment, with a need for well-trained and qualified labor.
- Low technological dependency: Tourism investments rely heavily on human resources rather than complex technological inputs.
- Economic contribution: Tourism investments significantly bolster a country's economy by creating new job opportunities and contributing to tourism income.
- Non-transferable assets: Tourism investments are considered intangible exports, as they cannot be relocated from one place to another (Belmerdasi & Yousfi, 2020, p. 69).

2. The Nature of the Business Climate

Investment environment indicators and the business climate are critical factors that directly influence the establishment of projects, including tourism investments. These indicators reflect the extent to which a country prioritizes and encourages improvements in the performance of active institutions.

2.1 Definition of Business Climate

2.1.1 Definition by the World Bank:

The business climate refers to a set of factors specific to a particular location that shape the incentives and chances for businesses to grow, provide employment, and make profitable investments. Government regulations affect costs, risks, and competition obstacles, all of which have a major effect on the business climate (Belatrache & Madjoub, 2020, p. 291).

- General Definition: The business climate encompasses the conditions and circumstances that affect the flow and utilization of capital (Oubakhti & Bourish, 2021, p. 109).
- Definition by Nicholas Stern: In 2000, Nicholas Stern, Vice President of the World Bank Group, defined the business climate as the combination of policies, institutions, and current and anticipated behavioral

environments that can influence the returns and risks associated with investment (Boudiaf & Brahimi, 2019).

2.2 Business Climate Indicators

2.2.1 Economic Freedom Index

A. Definition of the Economic Freedom Index:

Several organizations worldwide release economic freedom indices, but the index in focus here is published by the Heritage Foundation, an American research institute established in 1973. The foundation conducts studies and research related to economics and aims to promote public policies that uphold the principles of free trade, individual liberty, and traditional American values.

Since 1995, the Heritage Foundation has been issuing the Global Economic Freedom Index, which measures the degree of government restrictions on economic freedom. The index comprises ten variables categorized under the following factors:

- Trade Policy: Includes tariff rates and non-tariff barriers.
- Fiscal Health: Covers government budget management, especially the tax structure for corporations and individuals.
- Banking and Finance Sector: Evaluates the state of banking and financial systems.
- Price and Wage Levels: Assesses market control over prices and wages.
- Property Rights: Measures legal protections for property ownership.
- Bureaucratic and Administrative Regulations: Includes the impact of red tape on business operations.
- Black Market Activity: Examines the extent of informal economic activities.

Each of these ten components is weighted equally, and the index is calculated by averaging these sub-indices (Souhailia, 2019, p. 94).

2.2.2 Ease of Doing Business Index

A. Definition of the Ease of Doing Business Index:

This sub-index is part of the Business Climate Report, published annually by the World Bank and its affiliate, since 2004 the International Finance Corporation (IFC). The index calculates how government policies and policies affect the state of the economy, with a focus on small and medium-sized enterprises (SMEs).

Establishing a framework for assessing and contrasting business climates in industrialized and developing nations is the goal. The report provides quantitative indicators to assess government procedures that either facilitate or hinder business activities. Data is collected with the help of consultants, experts, lawyers, and government officials (Dahmani, 2016, p. 128).

2.2.3 Human Development Index:

A. Definition of Human Development

Human development is defined in reports issued by the United Nations Development Program (UNDP) (Brahimi, 2020, pp. 445–446). The first Human Development Report was published in 1990 and defined human development as the process of expanding people's choices, which includes opportunities in education, healthcare, income, employment, and various political, economic, social, and environmental areas.

The 1994 report described human development as a model that provides all individuals with the opportunity to expand their capabilities to the fullest extent and to utilize them effectively in all fields. It emphasized two key aspects: the formation of human capabilities in health, education, knowledge, and well-being, and enabling individuals to leverage these capabilities in leisure, production, or participation in social, cultural, and political fields.
The 2014 report expanded on these ideas, highlighting that human development involves equal life opportunities for all. It aims not only to expand current options for individuals to live healthy, productive, and secure lives but also to ensure these options do not compromise those available to future generations.

3. The Reality of Tourism Investment in Algeria

Most countries have prioritized tourism projects due to their role in generating foreign currency. Like other nations, Algeria has sought to foster tourism investment by enacting and amending laws to stimulate and encourage investment in this sector.

This study aims to construct an econometric model to analyze the impact of business climate indicators on tourism investment. It identifies specific business climate indicators that may influence tourism investment or one of its representative metrics. This is done through the stages and methodology of econometric analysis, relying on statistical and econometric tools essential for examining economic phenomena and causal relationships among variables. The model will be formulated and tested statistically, economically, and econometrically for the period 1990–2020.

3.1 Econometric Study

Tourism investment, like other types of investment, is influenced by various factors that economic theories have explained. In this case, the term "business climate" represents these conditions and policies. Business climate indicators serve as independent variables, while tourism investment, expressed as the value added by the tourism sector, is the dependent variable. The study covers the period 1990–2020.

3.2 Identifying Variables and Descriptive Analysis of Time Series

3.2.1 Identifying Variables and Data Sources

The time series analysis of tourism investment, as measured by its value added, and the business climate, as measured by a number of sub-indicators, including GDP, the Human Development Index, the Economic Freedom Index, and the Ease of Doing Business, are the main topics of this empirical study. The yearly data for 1990–2020 comes from figures that have been released by:

- National Office of Statistics (ONS)
- Ministry of Finance
- Bank of Algeria
- World Bank

Quantitative econometric methods will be employed to explore the relationship between tourism investment and the business climate in Algeria. This involves

constructing an econometric model to demonstrate the impact of the business climate on tourism investment in the country.

3.2.2 Dependent Variable

The dependent variable is tourism investment, represented by the value-added index of the tourism sector. The data, expressed in billions of Algerian dinars, was sourced from the National Office of Statistics. This variable is denoted by the symbol VT.

3.2.3 Explanatory (Independent) Variables

The explanatory variables in the model are the sub-indicators of the business climate, which include:

- Economic Growth Rate: expressed as the increase in GDP, or gross domestic product, which is the sum of the final values of the products and services that the economy produces within a given time frame, usually a year. The National Office of Statistics and the Bank of Algeria's publications provided the data, which was shown as a percentage. The GDP is the indicator for this variable.
- Ease of Doing Business Index: This index reflects various average timeframes associated with investment projects. It measures the impact of government regulations and laws on economic conditions. The data ranges from 0 to 100 points, sourced from the annual Doing Business reports issued by the World Bank. This variable is denoted by IBI.
- Economic Freedom Index: Economic freedom refers to the ability to make voluntary choices and enter into contracts within a stable and legally recognized framework that supports contracts and protects private property. The index comprises several sub-indices, with data ranging from 0 to 100 points, sourced from World Bank data. This variable is denoted by LE.
- Human Development Index: Human development involves expanding individuals' choices, such as opportunities in education, healthcare, income, and employment. The index also includes the average life expectancy of individuals. The data ranges from 0 to 0.80 or higher and was obtained from the United Nations Development Program (UNDP) and the National Office of Statistics. This variable is denoted by IDP.

4. Study Model Selection

The study model is defined as follows:

$$VT=f\ (GDP.IBI.LE.IDP)$$

The model's mathematical representation is:

$$VT= a+b1\ GDP+b2IBI+b3LE+b4IDP +Ui$$

Where:

- VT: Value added by the tourism sector.
- GDP: Economic growth rate.
- IBI: Ease of Doing Business Index.
- LE: Economic Freedom Index.
- IDP: Human Development Index.

- U_i: Random error term.
- b_1, b_2, b_3, b_4: Coefficients of the explanatory variables.

4.1 Descriptive Analysis of Time Series

Before conducting the econometric analysis, we aim to examine the relationship between the variables in the econometric model by presenting the individual relationship between the indicators of the independent variable (business climate and its sub-indices: economic freedom, ease of doing business, human development, GDP) and the dependent variable (value-added by the tourism sector).

4.2 Value Added by the Tourism Sector

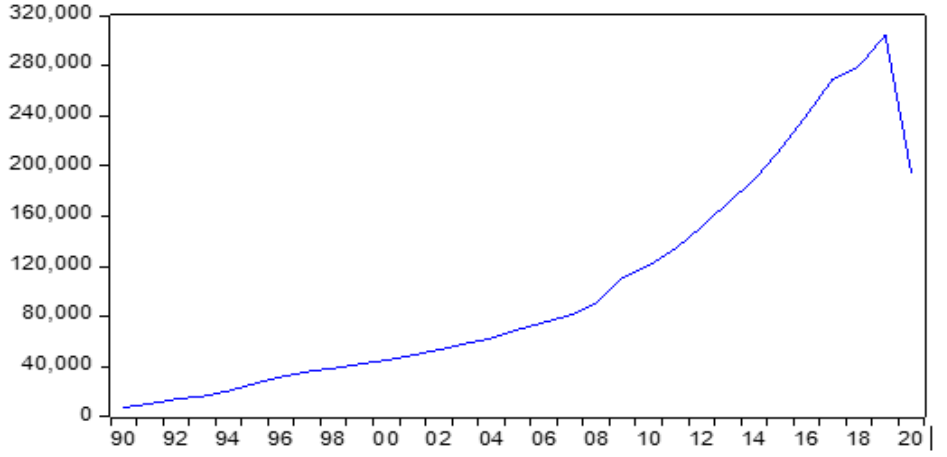


Figure (4-1): Description of the Evolution of Value Added by the Tourism Sector (1990–2020)
Source: Prepared by the student using EViews 10.

4.3 Economic Growth Rate

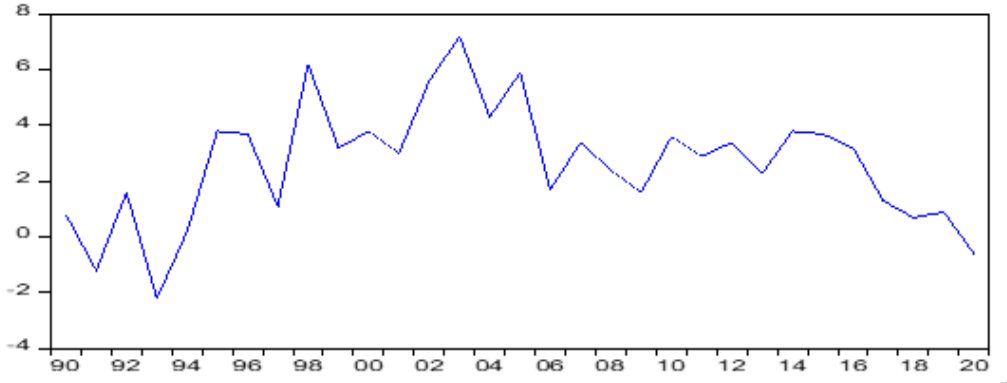


Figure (4-2): Description of the Evolution of Economic Growth Rate in Algeria for the Period 1990–2020
Source: Prepared by the student using EViews 10.

To illustrate the relationship between the value added by the tourism sector and Gross Domestic Product (GDP), represented by economic growth, we refer to the following figure:

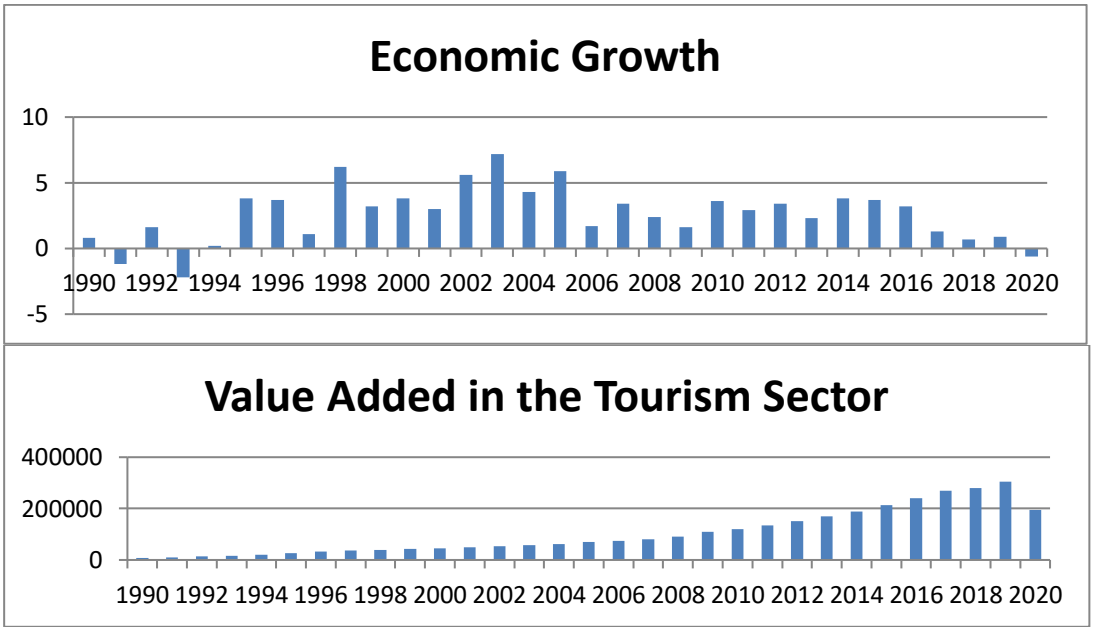


Figure (4-3): Evolution of Economic Growth and Tourism Investment in Algeria (1990–2020)
Source: Prepared by the student.

The figure above shows that the value added by the tourism sector was influenced by economic growth in Algeria during the period 1990–2020. Notably, during the 1990s, when negative economic growth was recorded, the value added in the tourism sector was at its lowest. However, at the start of the 21st century, the value added clearly improved as GDP grew.

4.4 Ease of Doing Business Index

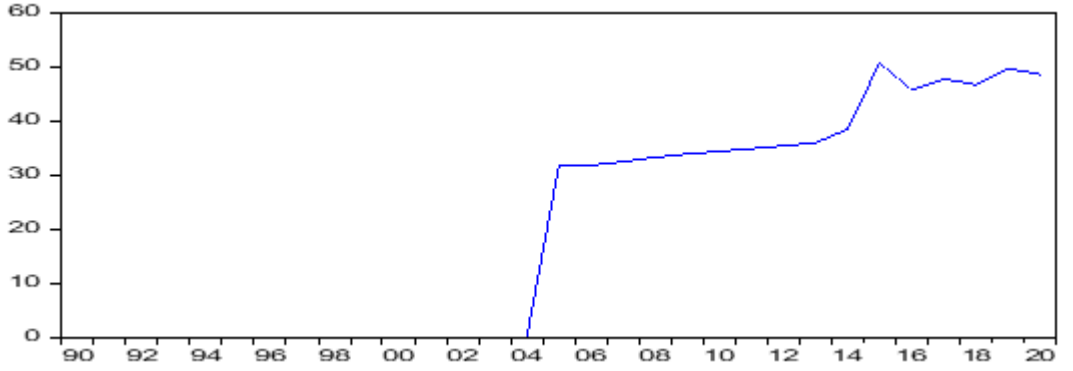


Figure (4-4): Description of the Evolution of the Ease of Doing Business Index in Algeria (1990–2020)
Source: Prepared by the student using EViews 10.

To illustrate the relationship between the value added by the tourism sector and the Ease of Doing Business Index, we refer to the following figure:

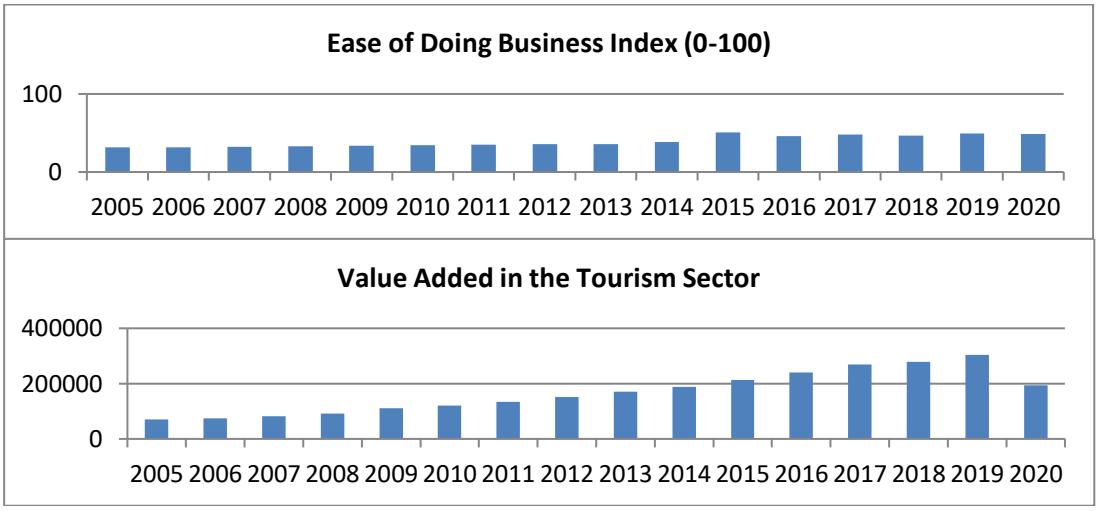


Figure (4-5): Evolution of Ease of Doing Business and Tourism Investment in Algeria (2005–2020)
Source: Prepared by the student.

From the figure above, we observe that the Ease of Doing Business Index showed a slight increase during the period 2005–2020. However, it had no significant impact on tourism investment, represented by the value added in the tourism sector, which saw a clear increase throughout the same period except for 2020, when it declined. Thus, GDP appears to have a more substantial effect on tourism investment than the Ease of Doing Business Index.

4.2 Economic Freedom Index

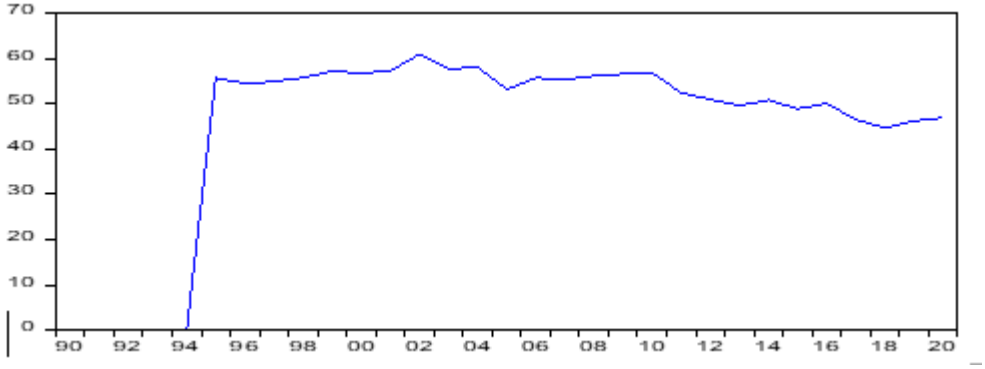
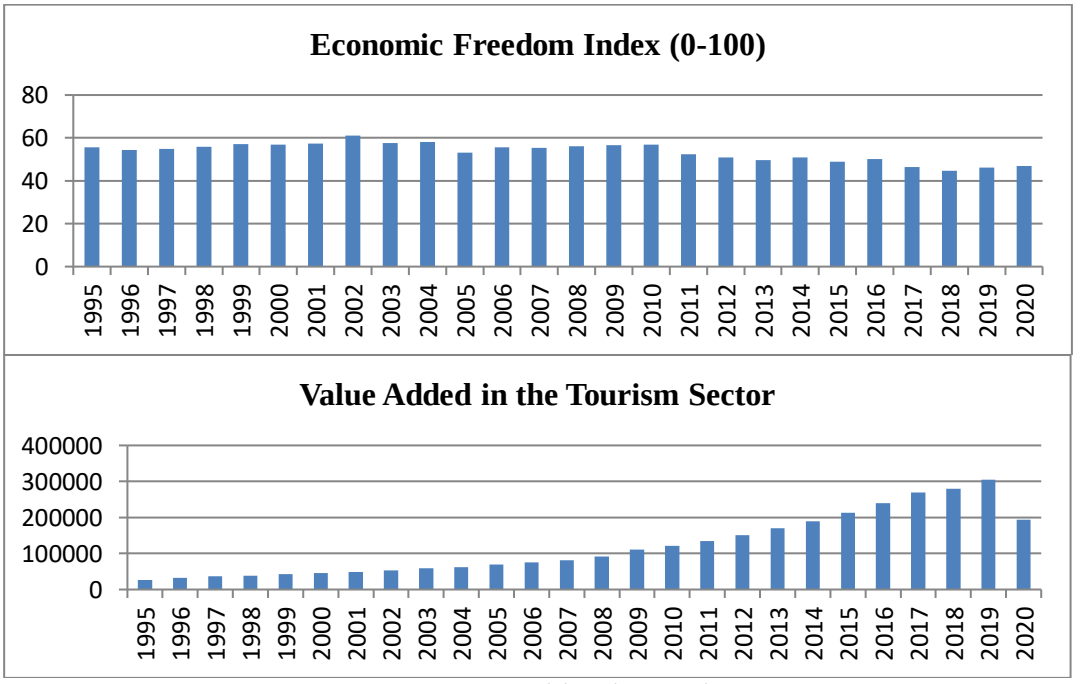


Figure (4-6): Description of the Evolution of the Economic Freedom Index in Algeria (1990–2020)
Source: Prepared by the student using EViews 10.

To further illustrate the relationship between the value added by the tourism sector and the Economic Freedom Index, we refer to the following figure:



Source: Prepared by the student.

The figure shows that the Economic Freedom Index in Algeria experienced slight fluctuations during the period 1995–2010. However, in the subsequent period leading up to 2020, the index showed a noticeable decline. Meanwhile, the value added by the tourism sector experienced a steady and significant increase throughout the period 1995–2019, only to record a decline in the final year. This indicates that the Economic Freedom Index has a weak impact on tourism investment, represented by the value added in the tourism sector. Therefore, this index may only have a short-term effect.

4.3 Human Development Index:

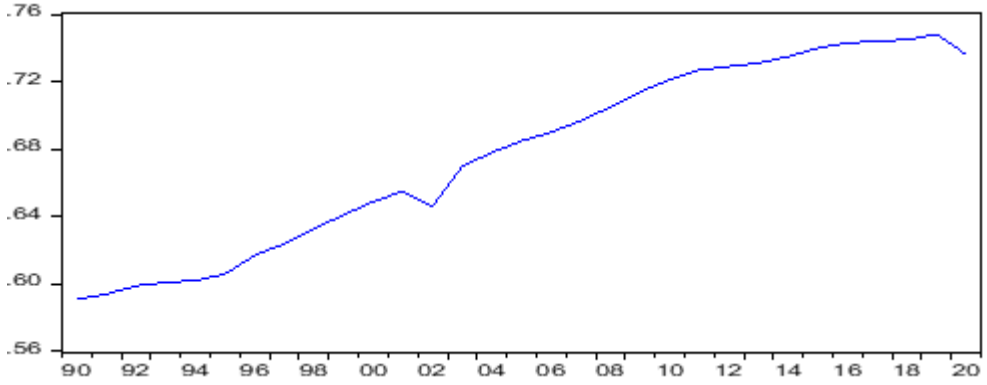
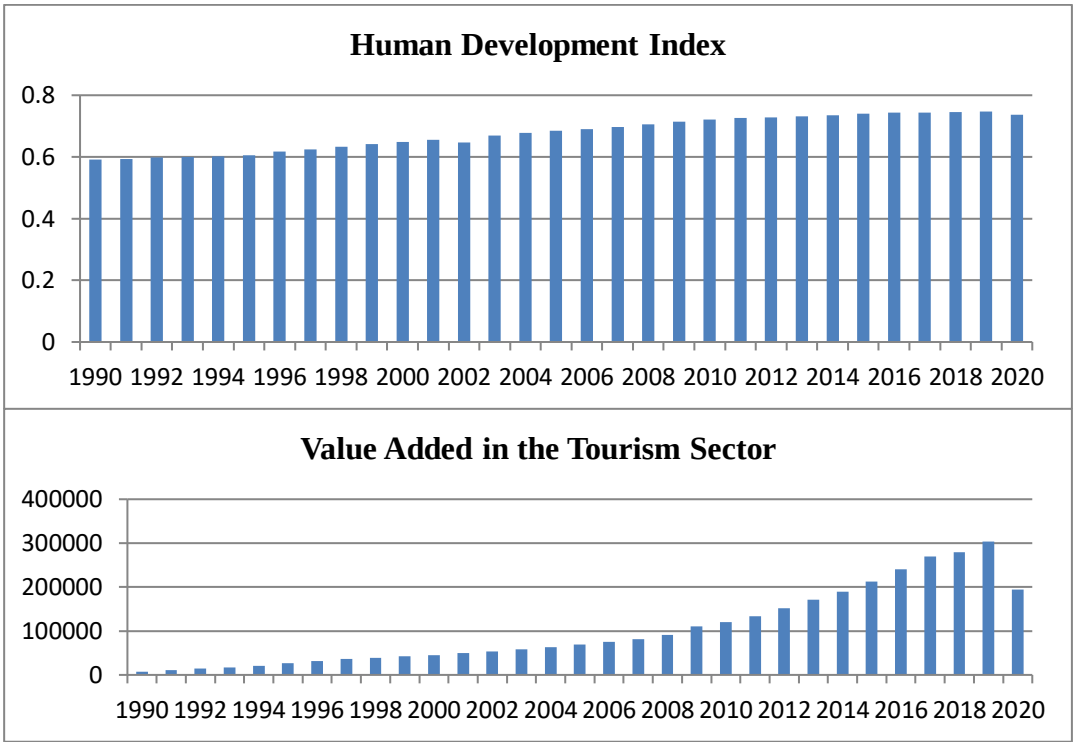


Figure (4-8): Description of the Evolution of the Human Development Index in Algeria (1990–2020)
Source: Prepared by the student using EViews 10.

To demonstrate the relationship between tourism investment, represented by the value added in the tourism sector, and the Human Development Index, we refer to the following figure:



Source: Prepared by the student.

The table above shows that the Human Development Index in Algeria experienced a slight increase throughout the period 1990–2020, which aligns with the continuous growth in the value added by the tourism sector. This indicates a direct impact of the Human Development Index on the value added in the tourism sector.

From the analysis of the study variables, it is evident that there is a relationship between the dependent variable (value added by the tourism sector) and the explanatory variables included in the model:

Table (4-1): Relationship Between Independent Variables and the Value Added in the Tourism Sector

Dependent Variable: VT
Method: ARDL
Date: 03/15/23 Time: 10:26
Sample (adjusted): 1994 2020
Included observations: 27 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): IBI IDP LE GDP
Fixed regressors: C
Number of models evaluated: 2500
Selected Model: ARDL(3, 4, 4, 4, 3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
VT(-1)	-2.089431	0.359153	-5.817655	0.0043
VT(-2)	4.629717	0.393438	11.76734	0.0003
VT(-3)	-1.875615	0.446154	-4.203959	0.0137
IBI	-315.7860	398.1392	-0.793155	0.4721
IBI(-1)	2458.604	460.2279	5.342145	0.0059
IBI(-2)	2499.520	405.9068	6.157866	0.0035
IBI(-3)	2953.547	333.7191	8.850399	0.0009
IBI(-4)	4171.855	417.8032	9.985215	0.0006
IDP	-2662977.	381411.3	-6.981903	0.0022
IDP(-1)	-253108.5	375296.4	-0.674423	0.5370
IDP(-2)	-1258233.	419064.4	-3.002481	0.0398
IDP(-3)	1415528.	591599.7	2.392712	0.0749
IDP(-4)	-687174.9	623590.6	-1.101965	0.3323
LE	-762.2465	223.1859	-3.415299	0.0269
LE(-1)	-71.00583	171.5070	-0.414011	0.7001
LE(-2)	-1263.246	183.1856	-6.895991	0.0023
LE(-3)	-1571.774	317.1584	-4.955800	0.0077
LE(-4)	1085.610	189.2016	5.737850	0.0046
GDP	17909.48	2481.789	7.216357	0.0020
GDP(-1)	15670.18	1656.069	9.462276	0.0007
GDP(-2)	25249.63	2106.955	11.98394	0.0003
GDP(-3)	20377.33	2058.944	9.896985	0.0006
C	2097308.	238278.9	8.801905	0.0009

R-squared	0.999539	Mean dependent var	116999.0
Adjusted R-squared	0.997003	S.D. dependent var	86268.21
S.E. of regression	4722.943	Akaike info criterion	19.55241
Sum squared resid	89224769	Schwarz criterion	20.65627
Log likelihood	-240.9576	Hannan-Quinn criter.	19.88065
F-statistic	394.1182	Durbin-Watson stat	2.372387
Prob(F-statistic)	0.000014		

*Note: p-values and any subsequent tests do not account for model selection.

Source: Prepared by the student using EViews 10.

5. Testing Stationarity and Determining Lag Length in the Model

5.1 Stationarity Test of Time Series Data

In order to verify the stationarity of the time series and ascertain the order of integration for each economic variable, the unit root test looks at the characteristics of the time series for each variable from 1990 to 2020. The Augmented Dickey-Fuller (ADF) test will be used to determine if the time series for the variables being studied is stationary.

The ADF test is based on the following hypotheses (Obben, 1998, pp. 109-121):

- H_0: The series contains a unit root, meaning the time series is non-stationary.
- H_1: The series does not contain a unit root, meaning the time series is stationary.

The original time series is subjected to this test at the level. First or second differences are taken until stationarity is reached if the series is not stationary. If the calculated ADF statistic's absolute value is more than the critical value at the 5% significance level and the p-value is less than 5%, the null hypothesis of a unit root issue is rejected. The ADF regression equation can be tested in three forms: with a constant, with a constant and trend, or without a constant and trend (Naif & Al-Huneiti, 2017, p. 26), as presented in the following table:

Table (4-2): Stationarity Tests Using the ADF Test at a 5% Significance Level

Variable	Model	Original Series			First-Degree Differenced Series		
		Level			1st difference		
		ADF	t-Statistic . 5%	Prob	ADF	t-Statistic. 5%	Prob
vt	III/None	-6.4481	-1.95291	0.0000			
	II/trend and intercept	-6.984	-3.5742	0			
	I/ intercept	-6.5633	-29677	0			
Gdp	III/None	-0.95863	-1.95247	0.294	-9.440722	-1.95291	0.0000
	II/trend and intercept	-2.984141	-3.568379	0.1529	-9.654282	-3.574244	0
	I/ intercept	-2.097961	-2.967767	0.2468	-9.271349	-2.967767	0.0000
ibi	III/None	0.588123	-1.952473	0.8378	-5.489696	-1.95291	0.0000
	II/trend and intercept	-2.472152	-3.568379	0.3384	-5.733336	-3.574244	0.0003
	I/ intercept	-0.530556	-2.963972	0.8715	-5.815276	-2.967767	0
Le	III/None	-0.178743	-1.952473	0.6134	-5.444391	-1.95291	0.0000
	II/trend and intercept	-1.920962	-3.568379	0.6188	-5.848267	-3.574244	0.0002
	I/ intercept	-2.426673	-2.963972	0.1433	-5.480932	-2.967767	0.0001
idp	III/None	4.176917	-1.952473	1	-1.71525	-1.953381	0.0815
	II/trend and intercept	0.176795	-3.568379	0.9966	-5.150048	-3.574244	0.0014
	I/ intercept	-1.484579	-2.963972	0.5275	-4.774825	-2.967767	0.0006

Source: Prepared by the student using EViews 10.

According to the preceding table, the value added in the tourism sector (VT), which serves as the dependent variable, has a time series that is stationary at the level, or stable in its initial series. However, because the ADF test statistic was not significant, it was discovered that the explanatory variables were non-stationary in their original series.

The explanatory variables in this instance—economic growth rate, the Ease of Doing Business Index, the Economic Freedom Index, and the Human Development Index—became stationary at first differences after the original series was transformed using first differences. Since the absolute values of the test statistics were higher than the appropriate critical values for each of the three ADF test models, this meets the stationarity requirement. This demonstrates a long-term link by confirming the cointegration between the dependent and explanatory variables.

5.2 Lag Selection in the Model:

The time it takes for the impact of one variable to become apparent on another is known as the time lag period. The answer to the following question establishes this period: How long does it take for one variable's effect to affect another? Because it has a substantial impact on the estimation results, choosing the right amount of delays is essential.

In the case of small samples (Alawi, Al-Fatlawi, & Al-Zubaidi, 2014, p. 269), it is recommended to minimize the number of lags. To determine the optimal lag length, the following criteria were used:

- Akaike Information Criterion (AIC)
- Schwarz Information Criterion (SC)
- Hannan-Quinn Information Criterion (HQIC)

These indicators choose the lag time that matches the criterion's lowest value. The following table displays the lag length test results:

Table (4-3): Lag Length Selection Test

AR Lag Order Selection Criteria
Endogenous variables: VT GDP IBI IDP INF LE OPEN U
Exogenous variables: C
Date: 05/16/23 Time: 13:58
Sample: 1990 2021
Included observations: 30

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-696.2876	NA	3.40e+10	46.95250	47.32616	47.07204
1	-517.7406	249.9657*	19102664	39.31604	42.67891*	40.39185
2	-422.3909	82.63643	6837704.*	37.22606*	43.57815	39.25815*

* Indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: Prepared by the student using EViews 10.

The results marked with * indicate the optimal lag length selected by the criteria (0, 1, 2). The test results suggest that the model should include a lag period of **2**, meaning the effect becomes apparent in the second year. This could be due to the dependency of economic variables in Algeria on GDP. Specifically, the current year's GDP value determines the state of investments, including tourism investments, in the subsequent two years.

6. Bounds Test and Cointegration Regression:

6.1 Bounds Test:

In this case, two hypotheses are considered:

- Null Hypothesis (H_0): Indicates no long-term relationship exists between the explanatory and dependent variables if the calculated F-statistic is less than the I1 Bound.
- The Alternative Hypothesis (H_1) states that if the computed F-statistic is higher than the I1 Bound, there is a long-term link.

The computed F-statistic is contrasted with the I1 Bound critical values. The following table displays the findings:

Table (4-4): Bounds Test Results

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	70.44983	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Source: Prepared by the student using EViews 10.

According to the table, at a 5% significance level, the computed F-statistic = 70.44 is higher than I1 Bound = 3.49. In this instance, we reject the null hypothesis and accept the alternative hypothesis, which shows that the dependent variable, which is the value added in the tourism industry, and the explanatory variables—economic growth rate, Ease of Doing Business Index, Economic Freedom Index, and Human Development Index—have a long-term relationship. The following is the long-term equation:

6.2 Cointegration Regression Using the ARDL Model

The presence of a long-term equilibrium link between economic growth, the Ease of Doing Business Index, the Economic Freedom Index, the Human Development Index, and the value added in the tourist industry is examined using a cointegration test. This entails determining the variables' integrative behavior over time by examining the long-term equilibrium nature of their connection. The variables business climate and tourism investment are considered cointegrated if they share at least one cointegrating vector in the ARDL model.

Since the Autoregressive Distributed Lag (ARDL) model does not require that all estimated variables have the same order of integration, it becomes the best option. Pesaran et Shin's Bound Test (2001) is used in the ARDL model to test for cointegration. This approach blends the Distributed Lag Model with the Autoregressive Model (AR(p)) (Narayan, 2005, p. 258).

6.3 Advantages of ARDL Over Traditional Cointegration Methods

- Flexibility in integration orders: ARDL can be applied regardless of whether variables are integrated at order I(0), I(1), or mixed orders.
- Small sample efficiency: It provides reliable results even when the sample size is small, unlike traditional methods that require large samples for efficiency.
- Simultaneous short and long-term estimation: ARDL estimates both short- and long-term components within a single equation, unlike traditional methods that require separate equations.

Table (4-5): ARDL Model Estimation Results

Dependent Variable: VT
Method: ARDL
Date: 05/16/23 Time: 14:37
Sample (adjusted): 1994 2020
Included observations: 27 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): GDP IBI IDP LE
Fixed regressors: C
Number of models evaluated: 2500
Selected Model: ARDL(3, 3, 4, 4, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
VT(-1)	-2.089431	0.359153	-5.817655	0.0043
VT(-2)	4.629717	0.393438	11.76734	0.0003
VT(-3)	-1.875615	0.446154	-4.203959	0.0137
GDP	17909.48	2481.789	7.216357	0.0020
GDP(-1)	15670.18	1656.069	9.462276	0.0007
GDP(-2)	25249.63	2106.955	11.98394	0.0003
GDP(-3)	20377.33	2058.944	9.896985	0.0006
IBI	-315.7860	398.1392	-0.793155	0.4721
IBI(-1)	2458.604	460.2279	5.342145	0.0059
IBI(-2)	2499.520	405.9068	6.157866	0.0035
IBI(-3)	2953.547	333.7191	8.850399	0.0009
IBI(-4)	4171.855	417.8032	9.985215	0.0006
IDP	-2662977.	381411.3	-6.981903	0.0022
IDP(-1)	-253108.5	375296.4	-0.674423	0.5370
IDP(-2)	-1258233.	419064.4	-3.002481	0.0398
IDP(-3)	1415528.	591599.7	2.392712	0.0749
IDP(-4)	-687174.9	623590.6	-1.101965	0.3323
LE	-762.2465	223.1859	-3.415299	0.0269
LE(-1)	-71.00583	171.5070	-0.414011	0.7001
LE(-2)	-1263.246	183.1856	-6.895991	0.0023
LE(-3)	-1571.774	317.1584	-4.955800	0.0077
LE(-4)	1085.610	189.2016	5.737850	0.0046
C	2097308.	238278.9	8.801905	0.0009

R-squared	0.999539	Mean dependent var	116999.0
Adjusted R-squared	0.997003	S.D. dependent var	86268.21
S.E. of regression	4722.943	Akaike info criterion	19.55241
Sum squared resid	89224769	Schwarz criterion	20.65627
Log likelihood	-240.9576	Hannan-Quinn criter.	19.88065
F-statistic	394.1182	Durbin-Watson stat	2.372387
Prob(F-statistic)	0.000014		

*Note: p-values and any subsequent tests do not account for model selection.

Source: Prepared by the student using EViews 10.

For the R^2 coefficient of determination, the table shows a value of 0.99, meaning that 99% of the variation in the dependent variable (value added in the tourism

sector) is explained by the explanatory variables—economic growth, Ease of Doing Business Index, Economic Freedom Index, and Human Development Index. The remaining 1% represents random errors (UI), which could stem from data inaccuracies, omitted quantitative variables, or unquantifiable variables.

7. Error Correction Model and Statistical Tests:

7.1 Error Correction Model (ECM) Methodology:

Here, the ARDL Cointegrating and Long Run Form approach is used to estimate the Error Correction Term (ECT). The following table displays the findings:

Table (4-6): ECM Estimation Results

ARDL Error Correction Regression
Dependent Variable: D(VT)
Selected Model: ARDL(3, 3, 4, 4, 4)
Case 2: Restricted Constant and No Trend
Date: 05/16/23 Time: 15:06
Sample: 1990 2020
Included observations: 27

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(VT(-1))	-2.754102	0.127719	-21.56369	0.0000
D(VT(-2))	1.875615	0.131620	14.25025	0.0001
D(GDP)	17909.48	833.3783	21.49021	0.0000
D(GDP(-1))	-45626.96	1645.900	-27.72159	0.0000
D(GDP(-2))	-20377.33	932.9385	-21.84210	0.0000
D(IBI)	-315.7860	187.3327	-1.685696	0.1671
D(IBI(-1))	-9624.922	355.3030	-27.08934	0.0000
D(IBI(-2))	-7125.402	263.3807	-27.05362	0.0000
D(IBI(-3))	-4171.855	188.0400	-22.18600	0.0000
D(IDP)	-2662977.	182379.9	-14.60127	0.0001
D(IDP(-1))	529880.1	155079.9	3.416821	0.0269
D(IDP(-2))	-728353.0	178099.7	-4.089581	0.0150
D(IDP(-3))	687174.9	221305.7	3.105093	0.0360
D(LE)	-762.2465	87.90786	-8.670971	0.0010
D(LE(-1))	1749.410	104.2712	16.77750	0.0001
D(LE(-2))	486.1633	76.96290	6.316853	0.0032
D(LE(-3))	-1085.610	88.32055	-12.29171	0.0003
CointEq(-1)*	-0.335329	0.010873	-30.83947	0.0000

R-squared	0.994421	Mean dependent var	6568.522
Adjusted R-squared	0.983883	S.D. dependent var	24801.57
S.E. of regression	3148.629	Akaike info criterion	19.18204
Sum squared resid	89224769	Schwarz criterion	20.04593
Log likelihood	-240.9576	Hannan-Quinn criter.	19.43892
Durbin-Watson stat	2.372387		

* p-value incompatible with t-Bounds distribution.

Source: Prepared by the student using EViews 10.

Two requirements must be satisfied for this test to be valid: the CointEq(-1) coefficient must be negative and statistically significant. Given that prob = 0.0000, which is less than 0.05, the table's CointEq(-1) value is -0.3353, which is negative and significant. Therefore, both conditions are satisfied, indicating the presence of short-term cointegration. The equilibrium relationship is restored within three years, demonstrating a rapid return to long-term balance. Additionally, the table shows that most of the explanatory variables are statistically significant, meaning that these variables—economic growth rate, Ease of Doing Business Index, Economic Freedom Index, and Human Development Index—positively influence the dependent variable, represented by the value added in the tourism sector, in the short term.

7.2 Statistical Tests for the ARDL Model

7.1.2 Autocorrelation Test Using LM Test

Table (4-7): Autocorrelation Test Results

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.123255	Prob. F(2,2)	0.8903
Obs*R-squared	2.962710	Prob. Chi-Square(2)	0.2273
Test Equation:			

Source: Prepared by the student using EViews 10.

Since the Prob. F-statistic value is much greater than 0.05, we accept the null hypothesis and reject the alternative hypothesis, indicating no serial autocorrelation between the residuals.

7.2.2 Homoscedasticity Test Using Breusch-Pagan-Godfrey

Table (4-8): Heteroscedasticity Test Results

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.100132	Prob. F(22,4)	0.9999
Obs*R-squared	9.588788	Prob. Chi-Square(22)	0.9897
Scaled explained SS	1.260199	Prob. Chi-Square(22)	1.0000

Source: Prepared by the student using EViews 10.

The Prob. F(22,4) value is higher than 0.05, according to the table. As a result, we accept the null hypothesis and reject the alternative hypothesis (H_1), proving that the model is heteroscedastic. This indicates that there is no issue with variance instability and that the residuals have constant variance.

7.3.2 Normality Test of Model Residuals Using Jarque-Bera

The following figure displays the results of the normality test for the estimated model's residuals, which we obtained using EViews 10:

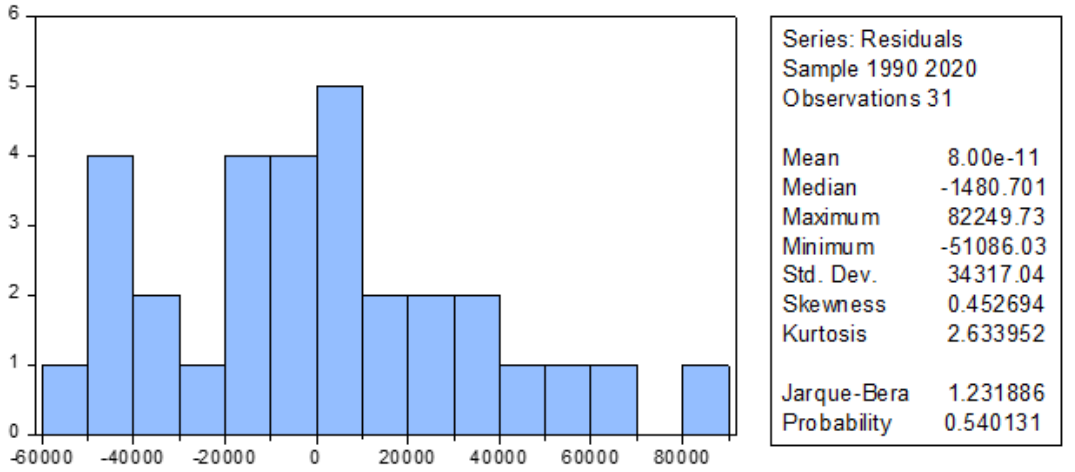


Figure (4-10): Normality Test for Model Residuals
Source: Prepared by the student using EViews 10.

We can see that the probability value for the Jarque-Bera statistic (Prob = 0.540131) is higher than 0.05 (5%) based on the normality test figure for the estimated model's residuals (Jarque-Bera). Consequently, a normal distribution is followed by the residuals.

Given that the model is economically valid, as its signs align with economic logic, statistically significant (based on Student's t-test and Fisher's F-test), and econometrically sound, it can be considered a reliable model for forecasting, analysis, and decision-making.

Conclusion

This study explored the theoretical concepts of tourism investment and business climate indicators. We aimed to examine the impact of the business climate on tourism investment in Algeria by presenting key findings from global business climate reports. To address the research question, an econometric study was conducted, which confirmed a relationship between business climate indicators (economic freedom, ease of doing business, human development, economic growth) and tourism investment, represented by the value added in the tourism sector.

Key Findings from the Theoretical and Empirical Analysis:

- Long-term equilibrium relationship: There is a long-term equilibrium relationship between tourism investment and the business climate.
- Causal relationship: Causality flows from the business climate to tourism investment in both the short and long term.
- Weak tourism sector performance: The tourism sector's contribution to total value added, as indicated by the tourism value-added index, remained below 2% during the period 1990–2020, highlighting the sector's underperformance and lack of sufficient investment attention.

- Strong explanatory power: According to the coefficient of determination (R2 = 0.99), business climate variables account for 99% of the variation in tourism investment.
- Significant long-term relationship: The calculated F-statistic = 70.44 exceeds the critical value (I1 Bound = 3.49), confirming a significant long-term relationship from the explanatory variables—economic growth, Ease of Doing Business Index, Economic Freedom Index, and Human Development Index—to the dependent variable, tourism sector value added.

Study Recommendations and Proposals:

The econometric study demonstrated the existence of cointegration between tourism investment and business climate indicators, confirming a long-term relationship. With a coefficient of determination (R^2) of 0.99, it is evident that 99% of the changes in tourism investment are attributed to the independent variables: economic growth, economic freedom, ease of doing business, and human development.

Given that economic growth depends on GDP developments, which in turn are tied to international oil prices, and that the Human Development Index recorded high values during most years of the study, the potential for improving tourism investment indicators hinges on enhancing the Economic Freedom and Ease of Doing Business indices in Algeria. Based on the findings of the empirical study, the following recommendations and strategies are proposed to stimulate tourism investment in Algeria:

- Enhancing flexibility in legal and regulatory frameworks: Adapt business climate legislation to respond to sudden crises, such as the COVID-19 pandemic.
- Increasing the share of tourism investment and private sector participation.
- Encouraging private sector involvement: Create a favorable business climate for tourism investments by offering supportive facilities and incentives.
- Eliminating administrative corruption and bureaucracy: Reduce the number, duration, and cost of administrative procedures.
- Revising the investment law: Provide more guarantees to investors to boost confidence and attract investment.
- Ensuring adequate financing: Adopt modern financing techniques and strengthen the banking system to support tourism projects.
- Developing human capital: Focus on enhancing the skills and capabilities of the workforce to meet the demands of the tourism sector.

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