

An econometric study of the impact of tourism on Non- hydrocarbon economic growth for the period 2005-2020

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Abstract:

This study examines the impact of tourism activity on Non-hydrocarbons economic growth in Algeria, using annual data extending from 2005 to 2020, where the study included into two parts, the first dealt with the theoretical aspect of tourism and economic growth, while the second part is devoted to econometric modeling of variables. Tourism (represented by tourism revenues, tourism expenditures and the number of tourists) and economic growth (presented by Non- hydrocarbons gross domestic product) according to the multiple linear regression model. The results indicates that tourism expenditures do not affect economic growth because they are not significant, but tourism revenues and the number of tourists affect economic growth according to a positive relationship.

Keywords: Tourism, Economic Growth, Econometric Model

Jel Classification Codes : C3 ;C5 ; O3 ;O4 ; Z3 ;Z32

Résumé:

Cette étude examine l'impact de l'activité touristique sur la croissance économique hors hydrocarbures en Algérie, en utilisant des données annuelles s'étalant de 2005 à 2020, où l'étude comprend deux parties, la première traite de l'aspect théorique du tourisme et de la croissance économique, tandis que la deuxième partie est consacrée à la modélisation économétrique des variables. Le tourisme (représenté par les recettes touristiques, les dépenses touristiques et le nombre de touristes) et la croissance économique (présentée par le produit intérieur brut hors hydrocarbures) selon le modèle de régression linéaire multiple. Les résultats indiquent que les dépenses touristiques n'affectent pas la croissance économique car elles ne sont pas significatives, mais les recettes touristiques et le nombre de touristes affectent la croissance économique selon une relation positive.

Mots clés: Tourisme, Croissance Economique, Modèle Econométrique.

Jel Classification Codes : C3 ;C5 ; O3 ;O4 ; Z3 ;Z32

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I. Introduction

Algeria has been facing difficult economic challenges since the 2014 oil crisis due to the decline in oil prices, but it can take advantage of these crises, which force the government to make strategic choices in order to build a diversified economy, which will be reflected in the increase in non-hydrocarbon incomes by paying attention to other sectors such as tourism, agriculture and industry. Etc. This reduces economic dependence on hydrocarbon revenues.

Among the sectors that the state has recently paid attention to is the tourism sector, which was marginalized despite the great potential that this sector possesses, according to the report of the World Economic Forum (Davos) May 2015, the tourism and travel sector contributes 9.5% of the global GDP, rising during the year 2018 to about 10%, with tourism revenues reaching to \$ 1300 milliards (Organization, 2018). This sector continues to play a prominent role and a key of employment creation, which increased by 9.4% in 2018, through the creation of 688 million direct and indirect jobs. In Algeria, the tourism sector contributes 590 billion dinars to the creation of value added to the GDP, and the generation of jobs estimated at 343,000 jobs, according to a report by the World Travel and Tourism Council in 2016.

According to the above, the following question can be asked: **What is the reality of tourism in Algeria? What is the impact of tourism on economic growth during the period 2005-2020?**

Based on the problem, the following hypotheses can be put forward:

- Algeria is supposed to have tourism potential, making it a promising tourist destination, but the contribution of tourism to GDP is small compared to other sectors;
- There is a significant relationship between tourism and non-hydrocarbon economic growth in Algeria.

1.Literature Review:

- A Study by Mohamed Sahel, Abdelhak Ben Tafat, (2018), entitled: "Highlighting the relationship between tourism and sustainable development while trying to model the economic dimension of sustainable tourism in Algeria for the period 1995-2016", published in the Journal of Studies and Research, Vol. 09, No. 30. The study aimed to highlight the relationship between tourism and sustainable development, and also tried to build a simple regression model for the economic dimension of sustainable tourism in Algeria, and the study found a positive relationship between tourism and sustainable development.
- A Study (Salah Eddine Sari Hassoun, Khayerddine Salim adda & asma hadjira sebbane) (2021), entitled: " Examining the connection among national tourism expenditure and economic growth in Algeria " published

in the Future Business Journal, Vol. 7, No. 14, where the study found that there is no common integration between per capita tourism spending and GDP, which prompted the researchers to use the autoregressive vector model (VAR). The results showed that there is a two-way causal relationship between the tourism variable and economic growth.

- A study Chehat Ouahiba & Akacem Kada (2022), entitled: "The Long-term Impact of Tourism on Economic Growth in Algeria Econometric Study Over The Period 1995-2015" published in the Journal of Quantitative Economics Studies, Volume 8, Issue 1, where this study examined the impact of tourism on economic growth in Algeria using the (VECM) model, and concluded that there is one common complementarity between the study variables Real GDP, international tourism revenues, human capital, and total capital formation Hard. On the other hand, there is a "one-way" causal relationship between international tourism revenues and economic growth.
- A study of Abderraouf Mtiraoui & Hassan Obeid (2024), titled: "The Impact of Tourism on Economic Growth in Tunisia: Application through ARDL Modelling," published in the Journal of Research Square, Vol. 1, aimed to examine the relationship between tourism and economic growth in Tunisia during the period from 1975 to 2018. Using the ARDL model, the results found that tourism revenues have a positive and statistically significant impact on GDP per capita in the short and long term.

I. General concepts about Tourism

1. Definition of tourism

Tourism has been known since ancient times in which humans used different means of transportation , starting with animals (animals and horses) to ships, cars, trains and planes to travel.

Tourism, according to the United Nations Tourism Organization (UNWTO), means: "a social, cultural and economic phenomenon that is reflected in the roaming of people outside the environment to which they are accustomed for personal, commercial or professional reasons. These people, whether they are residents or non-residents, are called tourists; the activities of tourists entail expenses called tourism spending" (unwto, s.d.), while the World Tourism Organization defined it as "a humanitarian activity, and a social phenomenon based on the movement of individuals from their places of permanent residence to areas outside their communities for a period of time not less than 24 hours, and not more than a full year, for a known tourism purpose, except for study or work" (Idir & Omar, 2019).

Inview of the above, we conclude that tourism is a social human phenomenon that starts from the movement of individuals from their place of

residence to other places for specific periods in order to entertain and hike, to become an economic activity based on meeting the needs of tourists and serving them.

2. Tourism Market

The tourism market differs from the another markets according to the value of the goods, as it has certain characteristics as follows:

1.2. Tourism demand

Tourism demand differs from the demand for any goods, because any other goods can be estimated into quantities; while the tourism product cannot be valued in this form due to the different nature of the tourism product from the goods product, and in general tourism demand can be defined as: "An expression of tourist trends to buy a tourist product or visit a specific tourist region or country; tourists in terms of demand trends for a particular area" (Samie, 1999) . From the definition the following can be seen (Tourism Demand, 2016):

- Tourism demand is a set of needs and desires, the latter of which must be accompanied by purchasing power;
- The size of the tourism market is linked to a specific region in the State or abroad;
- Tourism demand is linked to the time period so that it can be measured and determined.

2.2. Tourism supply

The term tourism supply refers to "a set of natural, artificial, social and historical tourist attractions available in the tourist area, in addition to the variety of tourism goods and services present in it at a certain time, and at a certain price, which makes tourists attracted to it."

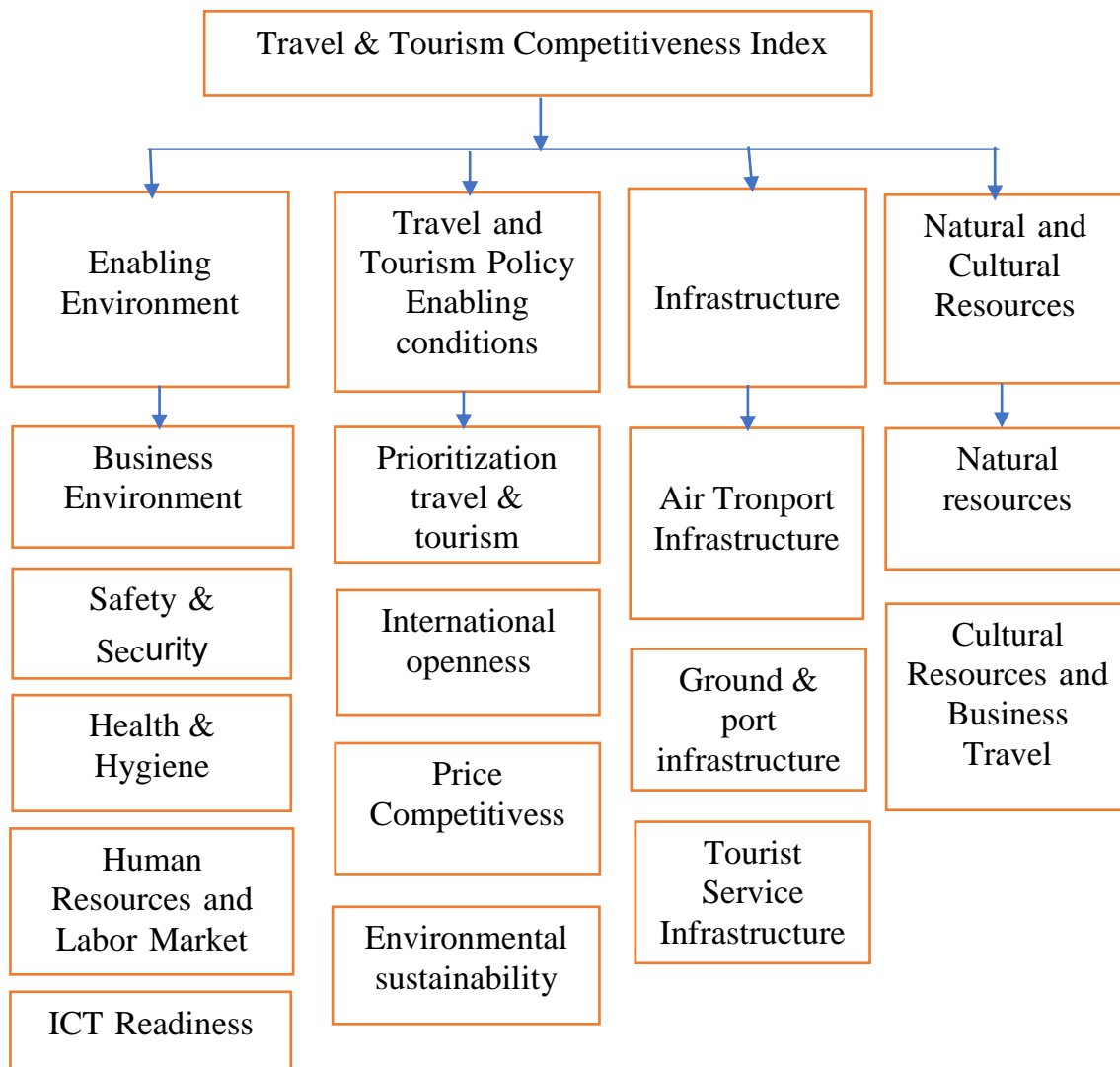
By definition the following elements can be deduced:

- The tourist offer consists of a range of tourism products such as natural religious archaeological sites... etc;
- The tourism product may be of a public or private nature;
- The tourist supply is during a certain period of time and at different prices (Youkhana, 2006).

3. Travel and Tourism Competitiveness Indicators

The Arab countries' competitiveness report is prepared on the basis of indicators, which vary according to each year, where other indicators can be added due to the difficulty of controlling the variables of the tourism market, for example: in 2014 it was three indicators, while in 2015 the report relied on four main indicators: enabling structure, tourism policies, travel and appropriate conditions, infrastructure and natural resources. While the 2018 report was as follows:

Figure (1): Travel and Tourism Competitiveness Indicators 2018



Source: World Economic Forum (2017)

According to the latest report on tourism and travel competitiveness (2018), Algeria is still lagging behind in the tourism industry, ranking 12th Arab out of 14 countries, and ranked 118th globally. In terms of the four main indicators, the results of Algeria's ranking were as follows:

- First index: Algeria scored 4.2 in the business environment, 5.3 in the safety and security, hygiene and safety, 4.9 in the health and hygiene, and the human resources and labor which scored 4, and the ICT readiness with 3.7
- The second index: Algeria scored 4.2 in the prioritization of travel and tourism, and 5.3 in the international openness, 4.9 in price competitiveness, and the environmental sustainability scored 4
- Third index: Algeria scored 2.1 in air transport infrastructure and 2.5 in Ground and port infrastructure, while in tourist service infrastructure it scored 2.1

- Fourth index: Algeria scored 2.2 in the natural resources and 2.1 in the cultural resources and business travel (Organization, Analysis of the Competitiveness of Tourism and Travel for Arab Countries, 2018).

4. World Tourism Organizations

Tourism is of great importance at the global level, as special bodies have been established for tourism activity, the most important of which are the United Nations Tourism Organization (UNWTO), the Arab Tourism Organization, and the World Travel and Tourism Council (WTTC) and includes 180 countries, and the latter has published reports on the importance of the tourism sector more than 20 years ago, and it was based on the extent to which tourism and travel contribute to global economic growth, as well as its role in generating GDP, income and job opportunities. The new report of the Council for the year (2016) tried to highlight the role of tourism and travel in driving the growth of the global economy compared to other sectors (Council, 2012).

5. Economic value of tourism

The economic contribution of the travel and tourism sector is manifested in three levels:

- Direct contribution: includes the added value related to the tourism and travel sector, such as: accommodation and services, leisure and entertainment services, transportation, food and beverage accommodation services, retail trade, and tourist expenses;
- Indirect contribution: measures the chain of indirect impact of each sector, such as: security services, car rental, tourism advertising and promotion, health services, tourism-related investments;
- The impact of tourism and travel: measures the income obtained directly and indirectly from the tourism sector and spent in the local economy such as: selling food and beverages, information and communication, industries, wholesale and retail trade, housing, individual services (Council, 2012).

As a summary of the economic impact on the macroeconomic situation, it can be presented in the following figure:

Figure (2): Implications of tourism



Source : World Travel & Tourism Council, "The Comparative Economic Impact of Travel Tourism", November 2012,p2.

6. Algerian tourism potential

Algeria occupies an area of 2,180,741 km² bordered to the north by the Mediterranean Sea, which is characterized by moderation, and to the south by the Sahara, and its terrain consists of mountains, plains, valleys, forests, lakes and beaches, and therefore Algerian tourist areas are characterized by their diversity and differences from one region to another, including the following:

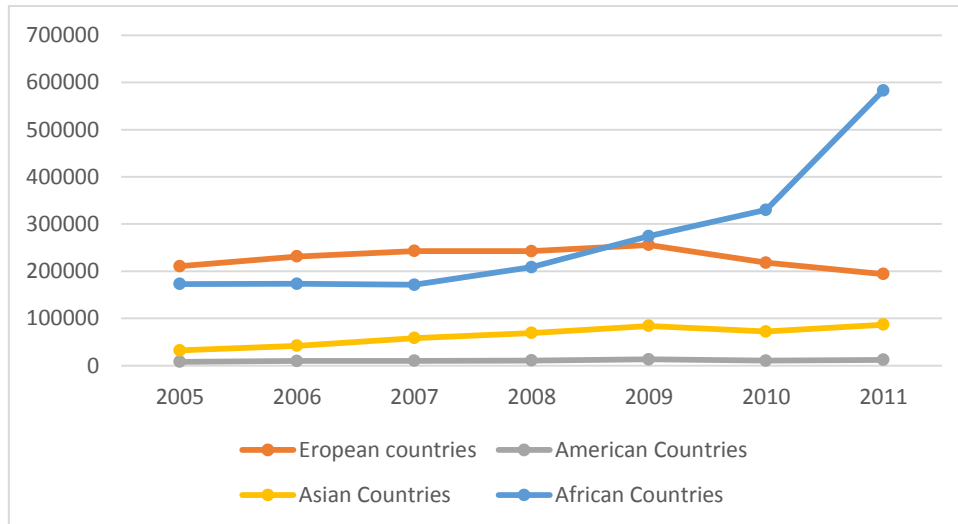
- Coastal zone: among them the following: El Kala (lakes, forests, livestock), Koraya in Bejaia (coastal landscapes) and Taza in Jijel (cave..... etc., in addition to the coastline.
- Desert areas: extends over about 2 million km² divided into five regions: the M'zab region of Ghardaia (architectural and cultural landmarks), the ancient castles of Adrar, the Tassili of Illizi, the Hoggar Mountains in the Tamanrasset region, and the Sahara (Tamimoun).
- Hammam al-Hamma'iyyah: Hammam al-Dabbagh in Guelma, al-Salihin in Biskra, Hammam Sidi Rabbi in Saida, Hammam Sokhna and Hammam Ouled Taban in Setif... etc.), mineral water (Saida, Qawaliyah, Yukos... etc) in addition to waterfalls.
- Mountainous areas: Upper Tikjda and the Sharia Mountains, the Aloncheris Mountains of Batna, the Babur Mountains of Setif... Etc.
- Cultural festivals: international and national festivals such as the Timgad Festival, the Jamila Festival, the International Book Fair, and the hosting of the Arab Capital of Culture (Constantine) (Bilel Mecerhed, 2020).

7. Tourism indicators in Algeria

7.1. Number of tourists

Tourism in Algeria has recorded a remarkable development in attracting tourists, as their number increased in 2006 by 13.4% compared to 2005, while in 2011 it recorded an increase of 15.66% compared to the previous year; it can be noted that the number of tourists in 2012 exceeded the threshold of two million tourists (Zerzar Al-Ayashi, 2015). However, in 2023, the number of tourists decreased to 1.5 million foreign tourists (Didouch, 2023), and the following table shows the evolution of the number of foreign tourists by geographical regions.

Figure (3): Development of tourists in Algeria in the period 2005-2011



Source: ONS website on 23/03/2024

We note that European tourists accounted for a large percentage compared to the rest of the tourists in 2005, but over the years African tourists accounted for 15.93% of the total tourists in 2011.

7.2. Number of Hotels

Tourist hotels are considered those "institutions approved by the Ministry of Tourism, so that they meet the technical standards imposed by the law, which classifies hotels into five classes", in addition to travelers' hotels entitled unclassified hotels, which are: "accommodation institutions, not approved by the Ministry of Tourism and not classified" The following table shows the evolution of the number of hotel categories during the period 2007-2011 (Chaoubi, 2007).

Table (1): Evolution of the number of hotels in Algeria during the period 2007-2011

	2007	2008	2009	2010	2011
Five Star Hotels	13	13	13	13	13
Four Star Hotels	54	53	57	39	64
Three Star Hotels	145	142	152	77	60
Two star hotels	157	160	148	72	74
One-star hotels	97	99	101	58	58
Unrated hotels	674	680	680	893	915
Total	1140	1147	1151	1152	1184

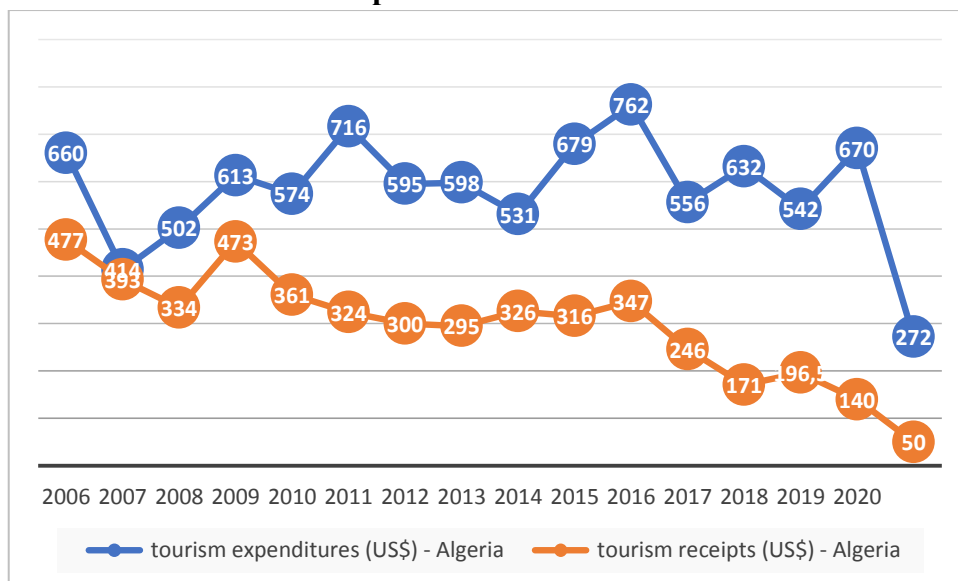
Source: Office national des Statistiques (Algérie) et Ministère du tourisme & de l'Artisanat , 23/03/2023

We note that the number of hotels is slowly increasing during the period 2005-2011 reflects the lack of seriousness of successive governments in order to promote the tourism sector, and this is what was evident in the year 2023, as the number of hotel establishments reached 1576 institutions (Tourism, s.d.), and this is due to the increase in the number of tourists, whether local or foreign, and thus led to an increase in the volume of tourism investments, especially hotel ones, and it can be noted that hotels without classification account for about 50% of the total hotels of all kinds.

7.3. Development of tourism revenues and expenditures in Algeria

Tourism revenues in Algeria witnessed a significant decline during the period 2005-2008, reaching 334 million USD in 2008, due to the policy of media promotion of tourism adopted by Algeria at the time, from cultural and scientific events, but it rose in 2009 to decline again from 2010 until 2020, where tourism revenues at the end of 2020 amounted to about 50 million US dollars, for several reasons, including: Covid-19, where border crossings and airports were closed, in addition to the repercussions of the Algerian popular movement in early 2017, which continued until 2019, not to mention the lack of seriousness of the government and the guardian ministry in promoting the tourism sector in Algeria despite the huge expenditures directed to the sector, which changed slightly during the period 2005-2020 with an average of 582.25 million USD, which was directed to the establishment of hotels and tourist resorts and the creation of sources of comfort for tourists, and the following figure shows the development of tourism revenues and expenditures in Algeria during the period 2005-2020.

Figure (4): Evolution of tourism revenues and expenditures in Algeria during the period 2005-2019



Source: Prepared by the researcher based on World Bank data:

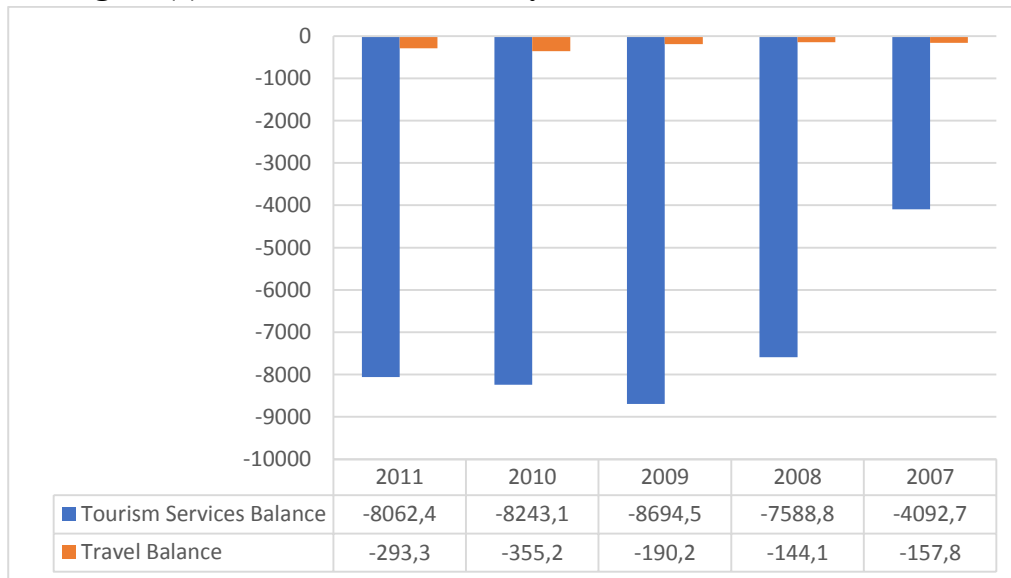
<https://data.albankaldawli.org/indikator>

7.3.1. Tourism Balance of Payments

The balance of payments for tourism is defined as: "an organized register consisting of two sides, a creditor side recorded in the operations from which the state obtains foreign exchange for the services it exports abroad, and a debit side in which all operations that pay the state for the services it imports from the outside world are included" (Chaoubi, 2007).

The following figure shows the evolution of the Algerian tourism balance of payments during the period 2007-2011

Figure (5): Tourism Balance of Payments, Unit Million US Dollars



Source: ONS website on 22/03/2024

From the figure, we note that the balance of services and travels both achieved negative results, as the balance of tourism services reached a maximum value of (-8694.5) in 2009, while the balance of travel recorded a large value in 2010 estimated at (-355.2).

7.4. Contribution of tourism to employment

Tourism and travel contributed to the creation of 327,500 direct jobs in 2015 representing 3% of total employment; this percentage is expected to rise to 4.8% in 2016 (343,000 jobs). These functions include: hotel services, travel agencies, airlines and other passenger transport services (excluding passenger services) and also include, for example, restaurant activities, entertainment.

In 2026, employment from this sector is expected to reach 934,000 jobs (6.6% of total employment) (Council W. T., 2016).

7.5. Contribution of tourism to GDP creation

Tourism is one of the sources of national income and contributes significantly to the provision of foreign currency necessary for development processes, while in Algeria, tourism and travel contributed to creating the added value of GDP in 2010 by 1.61\$ Billiards (1.3% of GDP), reaching 2.35 Billiards USD in 2014, while the added value of the tourism sector in Algeria

during 2019 amounted to about \$ 2.91 billion, witnessing a decline of 1.45 Billiards USD in 2020. With regard to the contribution of the tourism sector to the GDP, the relative importance of the sector has increased, contributing 1% of GDP in 2020, which is shown in the following table:

Figure(6): Evolution of the value added of the tourism sector and its contribution to GDP in Algeria



Source: Prepared by the authoritative researcher

Hadia Brahimi & Khaled rouaski, The Economics of Tourism in Algeria: A Statistical Study During the Period (1999-2018). journal of economics and applied statistic, 2020, p118, p101-121 Ministry of Tourism <https://www.mta.gov.dz/?s=gdp>

II. General Concepts for Economic Growth

1. Definition of economic growth

Economic growth is often considered an indicator of wealth but does not represent the well-being of a particular country, because it lacks information on how to redistribute this wealth or the indirect effects of production on the environment, as the economic debate always revolves around the difference between economic growth and development, the latter takes into account additional factors such as collective well-being, social justice, life expectancy, quality of institutions, environmental safety (Alfano, 2014).

However, economic growth means "the increase in the production of goods and services produced by a given economy over a certain period of time, using the elements of production land, labor, capital and technology (Salem, 2022).

2. Measure economic growth

Growth is measured by measuring output growth and per capita income growth (Azi, 2019).

1.2. National Output: It is a measure of the outcome of a country's productive activity, which can be calculated by summing up the production of all sectors in a

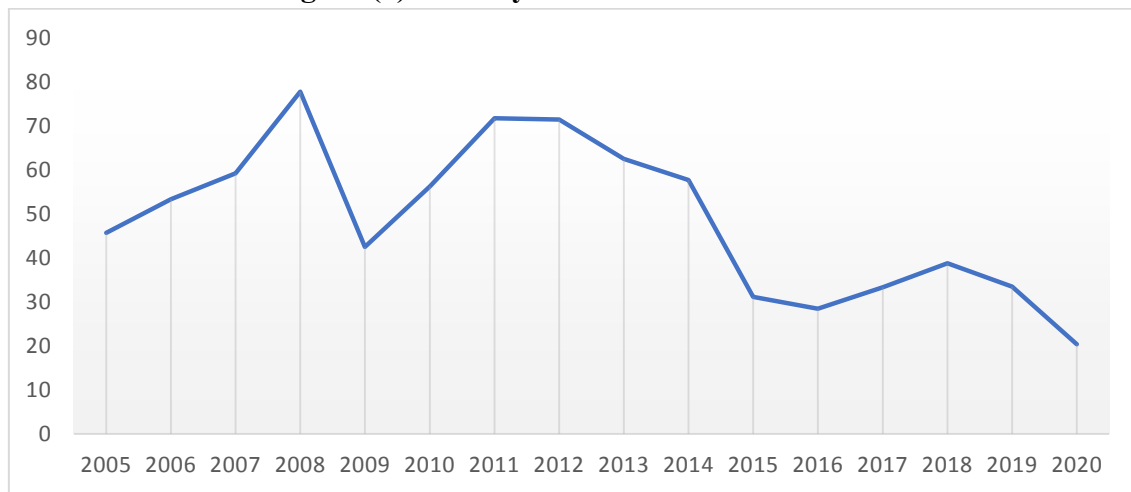
country and evaluating it in the currency of that country, and then comparing it with the results of the previous period.

2.2. Per capita income: measures the growth achieved at the level of each individual in terms of increasing what he spends.

3. The development of economic growth in Algeria

Since Algeria is overly oil-dependent, oil revenues account for a large percentage of GDP, and therefore it is better to study non-hydrocarbon GDP to find out the reality of the impact of tourism added as shown in the following figure:

Figure (7): Non-hydrocarbon GDP evolution



Source: Prepared by the researcher based on the reports of the Algerian Bank

Non-hydrocarbons economic growth during the period from 2005 to 2008 recorded a continuous increase due to Algeria's dependence on development programs (the economic recovery program, and the supplementary program to support growth), but it declined in 2009 as a result of the global crisis (2008), to rise again for two years due to the financial allocations allocated to the sectors of agriculture, tourism and industry within the third public program (consolidation of growth), but then decreased from 2013 to 2020 to reach \$ 20.40 billion as a result of a decline Oil revenues that affected allocations directed to the advancement of other sectors, in addition to the negative of the Covid-19 crisis.

4. The relationship of tourism to economic growth

Tourism did not take that great interest in the field of economic development until the twenty-first century, however, we find that there are some studies that clearly touched on the contribution of tourism to the economy, for example the study of MRIN (1992) where it found a positive impact of tourism revenues on economic growth indirectly, while Gray (1966) addressed the economic contribution of tourism in developing countries, and the study of Lanza & Pigliaru (2000) examined the essence of the relationship between Tourism and growth in some countries, where I found that countries that focus on tourism

share two characteristics: they are small countries and their average per capita income is growing rapidly (Maria del.Pablo-Remero, 2013).

III. Empirical Study

1. Data source

In this aspect, we will try to measure the impact of tourism on non-hydrocarbon economic growth in Algeria, based on a set of variables representing tourism (tourism revenues, tourism expenditures, number of tourists), which are time series from 2005-2020 taken from the World Bank database.

2. Model variables

The current study is based on determining the variables representing tourism and economic growth on what was stated in previous applied studies, and the following table shows the variables of the study in addition to their symboling and source.

Table (02): Definition of study variables

Variable	Indicators	symbol	Source
Tourism (independent variable)	Tourism revenue (million USD)	TR	World Bank
	Tourism expenditure (million USD)	TE	
	Number of tourist arrivals (million)	TA	
Non-hydrocarbons Economic growth (dependent)	NON-Hydrocarbons GDP	NHGDP	Bank of Algeria

3. Model Specification

To study the impact of tourism on NON-Hydrocarbon GDP in Algeria, we will consider NHGDP as a dependent variable in the study, and the variables: tourism expenditures, tourism revenues and the number of tourists arriving in Algeria as independent variables according to the following formula:

$$\text{NHGDP}_t = \beta_0 + \beta_1 \text{TE} + \beta_2 \text{TR} + \beta_3 \text{TA} + \varepsilon_t$$

Where:

β_0 : represents the constant

$\beta_1; \beta_2; \beta_3$ Parameters of independent variables in the model;

ε_t : Error term.

4. Findings and Discussion

4.1. Model Estimation

It follows the usual method OLS (Least Square Method) in the estimation process by entering all the variables into the model, unlike the (STEPWISE) method, which depends on including the variables one by one (Al-Jaouni, 2008). The model was also used in estimating the EViews 13 program, and the results were as follows:

$\text{NHGDP} = 10.72 - 0.051 \text{ TE} + 0.113 \text{ TR} + 16.97 \text{ TV}$			
	(0.53)	(0.14)	(0.00)
N= 16	(Adjusted R ²)=0.5015		Prob F=0.00

so that the values in parentheses represent the probability of error (Prob). The model will be studied according to two criteria as follows:

4.1.1. Statistical criteria

We note that the constant (β_0) is not significant because the probability of error is greater than 5%, and therefore we accept the null hypothesis that the value of the constant is equal to zero;

- For the parameter of tourist expenditures (β_1), we note that the probability of error is greater than 5%, and therefore we accept the null hypothesis that its coefficient is not significant;
- Tourism revenues explain changes in Non-hydrocarbons GDP, because the value of their coefficient (β_2) is not equal to zero, and this is due to the acceptance of the alternative hypothesis;
- For the number of tourists parameter (β_3), we note that the probability of error is less than 5%, and therefore we accept the alternative hypothesis that provides for the significance of the coefficient, at the 5% level;
- We note that there is a weak correlation of the relationship of Non-hydrocarbons GDP as a dependent variable with independent variables, and the result of Adj. R² indicates that the model is capturing 0.5015 variation and its Prob. value shows that the effect of independent variables is insignificant, and this indicates that the independent variables control 50.15% of the changes that occur on Non-hydrocarbons GDP, while the remaining 49.85% is due to other factors not included in the model.

4.1.2. Economic criteria

- For tourism expenditures: The negative reference in the regression equation for the coefficient of this variable indicates that the relationship between tourism expenditures and Non-hydrocarbons GDP is an inverse relationship, and this is contrary to the economic theory according to "Keynes" that every increase in expenditures leads to increased economic growth;

- For tourism revenues: The positive sign in the regression equation for the coefficient of this variable indicates that the relationship between tourism revenues and Non-hydrocarbons GDP is a direct relationship, as if revenues increase by \$ 1 million, non-hydrocarbon GDP will increase by \$ 0.113 milliards;
- As for the number of tourists: The positive sign in the regression equation for the coefficient of this variable indicates that the relationship between the number of tourists and the Non-hydrocarbon GDP is a direct relationship, as the more tourists by one million people, the higher the Non-hydrocarbons GDP by 16.97 milliards USD.

4.2. Improve The Model

The previously obtained model is not good from a statistical point of view, so we must, by omitting the variables that do not have statistical significance, and the results were as follows:

$$\begin{array}{l} \text{NHGDP} = 0.09 \text{ TR} + 10.94 \text{ TV} \\ \qquad \qquad (0.00) \qquad (0.00) \\ \text{N} = 16 \qquad (\text{Adjusted } R^2) = 0.4854 \qquad \text{DW} = 1.12 \end{array}$$

The results show the following:

- Revenues are intangible and they explain the changes in Non-hydrocarbons GDP, because the value of the revenue coefficient is not equal to zero.
- With regard to the number of tourists parameter: we note that the probability of error is less than 5%, and therefore we accept the alternative hypothesis that the number of tourists explains the changes in Non-hydrocarbons GDP in Algeria;
- The adjusted coefficient of determination was 0.4854, which indicates that the remaining independent variables (volume of production and population) control 48.54% of the changes that occur in Non-hydrocarbons GDP, while the remaining 51.46% is due to other factors not included in the model.
- Whenever revenues rise by \$ 1 million, this leads to an increase in non-hydrocarbons GDP by \$ 0.09 milliards.
- In terms of population: If the population increases by 1 million, the non-hydrocarbons GDP increases by \$10.94 milliards.

4.3. Residual Diagnostics

The standard problems affecting the latter model are studied by examining the residual and stability of the model over the period (lack of an inflection point).

4.3.1. Autocorrelation of residuals

To study the hypothesis of no autocorrelation to the error term, we use the Darbin-Watson DW test with a value of 1.12 and it is located in the uncertainty region ($D_l=0.98$; $D_u=1.54$), so we cannot say for sure that there is no

autocorrelation between the residues, so we use the LM test with one delay, and the results are as follows:

Table (3): LM Test Results

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.631536	Prob. F(1,11)	0.4436
Obs*R-squared	0.868722	Prob. Chi-Square(1)	0.3513

Source: Prepared by the researcher using the EVIEWS10 program

We see that the probability value Prob = 0.4436, which is greater than 5%, which means accepting the null hypothesis (H0) that assumes that there is no autocorrelation for the remainders.

4.3.2. Heteroskedasticity of residues

There are several tests to detect the homogeneity of the variation of residues or not, including the ARCH test, and the results of this test are shown in the following table:

Table (4): ARCH Test Results

Heteroskedasticity Test: ARCH

F-statistic	0.009669	Prob. F(1,13)	0.9232
Obs*R-squared	0.011148	Prob. Chi-Square(1)	0.9159

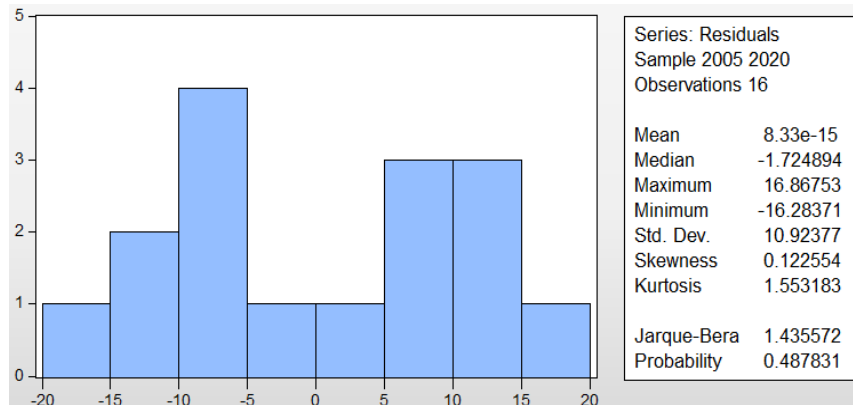
Source: Prepared by the researcher using the EVIEWS10 program

The results of this test show that Prob = 0.9232, which is greater than 5%, and from this we accept the null hypothesis H₀, which states the homogeneity of residues.

4.3.3. Normal distribution of residues

We will rely on the Jarque-Bera statistic, where we can see through the figure below that the probability value of the statistic is equal to Prob = 0.4878, which is greater than 5%, and from it we accept the null hypothesis, which states that the residuals follow the normal distribution.

Figure (8): Jarque-Bera test results

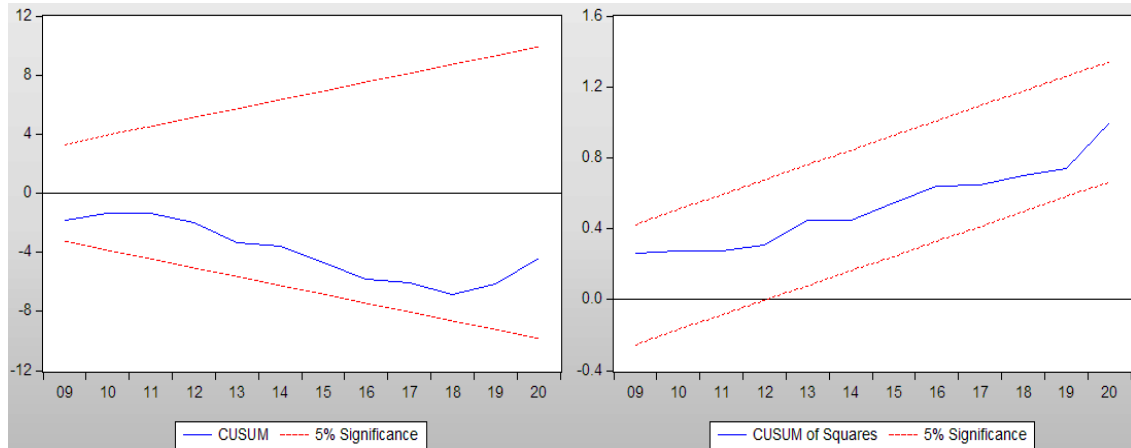


Source: Prepared by the researcher using the EVIEWS10 program

4.4. Stability Diagnostic

To ensure that the latter model is free of any structural changes, one of the appropriate tests must be used, such as: the cumulative sum of residuals (CUSUM), and the cumulative sum of the squares of residuals CUSUM OF Squares, where we note that the curve in the graph of the previous two tests within the critical limits at a level of significance 5%, and the following figure shows this:

Figure (9): Model Stability Test Results



Source: Prepared by the researcher using the EVIEWS10 program

From the above diagram, we can see that the cumulative sum of residuals (CUSUM) and the cumulative sum of squares of residuals (CUSUM of Squeres) for this model within the boundaries of the critical region, indicating that the model is stable at 5% significant limits, i.e. there is stability of the model over the period studied.

IV Results

In this research paper, we tried to look at the impact of tourism on economic activity as well as that relationship according to a standard model during the period 2005-2020, and we reached the following results:

- Algeria has great potential in the field of tourism that make it a global tourist destination, but its contribution to GDP and employment is small compared to other sectors, owing to the weakness of the tourist base structures, especially hotels classified globally;
- Algeria ranked behind in the field of tourism, according to the 2018 competitiveness report, and therefore gaps and weaknesses must be addressed and strengths maintained and strengthened;
- Algerian tourism is dominated by the nature of foreign tourism (Saudi Arabia, Tunisia, European countries.. etc.), and this is due to the poor performance of tourism agencies in presenting Algeria as a global tourist destination;

- The results of the study show that tourism expenditures do not affect economic growth during the period because they are insignificant. However, tourism revenues and number of tourists affect non-hydrocarbon economic growth in a positive relationship.

IIV Conclusion

The study concludes that tourism activity has a positive impact on non-hydrocarbons economic growth in Algeria. The study recommends that the Algerian government should promote tourism activity by investing in tourism infrastructure, improving the quality of tourism services, and marketing Algeria as a tourist destination

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