The economic impact of tourism industry on unemployment in Algeria

The ARDL bounds testing approach (1995-2018)

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Abstract:

This research paper aims to know the extent of the contribution of the tourism industry to alleviating unemployment in Algeria, by an econometric study in which we have used an autoregressive distributed lag approach applied to the annual time series for tourism employment that represent the percentage of the contribution of the tourism sector In employment to the total employment employed nationally, and the unemployment rate during the period from 1995 to 2018.

The study concluded that there is a long-term equilibrium relationship between tourism employment and unemployment rates, which means that unemployment rates responds to changes in tourism employment in the long term, and since this relationship is inverse and significant, it is possible to rely on tourism as a strategic option in addressing unemployment at the long term .

Keys words: Tourism, Unemployment, Tourism employment, ARDL models,

JEL classification codes: L83, J64, E24, C5

ملخص:

تهدف هذه الورقة البحثية إلى معرفة مدى مساهمة صناعة السياحة في التخفيف من حدة البطالة في الجزائر ، وذلك من خلال دراسة قياسية استخدمت فيها منهجية الانحدار الذاتي للفجوات الزمنية الموزعة (ARDL) ، طبقت على سلاسل زمنية سنوية لكل من العمالة السياحية التي تمثل نسبة مساهمة القطاع السياحي في التوظيف إلى إجمالي العمالة المشتغلة وطنيا، ونسبة البطالة خلال الفترة الممتدة من 1995الى 2018 .

بينت نتائج اختبار ARDL إلى وجود علاقة توازنية طويلة الأجل بين المتغيرين، وهو ما يعني استجابة البطالة لتغيرات العمالة السياحية على المدى البعيد، وبما أن هذه العلاقة عكسية ومعنوية، فانه يمكن الاعتماد على السياحة كخيار استراتيجي في معالجة البطالة على المدى البعيد.

الكلمات المفتاحية: السياحة، البطالة، العمالة السياحية، نماذج ARDL.

تصنيف JEL: L83، J64،E24 ،C5 .

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1-Introduction

Tourism sector is a labor-intensive industry and an important source of employment (Dayananda & Leelavathi, 2016), as it provides a wide field for employment in various qualified and unqualified scientific fields and levels, either directly within the tourism sector itself, or indirectly by contributing to the provision of job opportunities in the sectors that supply tourism with its needs of goods and services, Consequently, tourism is considered a key sector for economic recovery (Jucan & Sabina, 2013).

The orientation towards the tourism sector in many developing countries has become a way out of the unemployment crisis, and the alleviation of many economic and social problems, especially when development paths in other sectors are weak, or suffer from obstacles or crises, such as the oil shocks that the world's economies were exposed to.

And since Algeria is among the countries for which unemployment is a great dilemma, which has become one of the most prominent challenges it faces, especially in light of an exhausted economy, and in order to increase the number of job positions, it has made great efforts represented in a set of development plans and programs, which included many investments and huge projects. Which affected all sectors, including the tourism sector.

Therefore, the aim of this paper is to examine the link between Tourism industry and unemployment in Algeria over the period 1995–2018, using the auto-regressive distributed lag approach to co-integration analysis; in order to confirm whether Tourism sector have had a positive impact on unemployment or not.

From this point of view, we will begin by posing the following problem:
What is the impact of tourism industry on unemployment in Algeria?

Each study hypotheses at the beginning of the research to prove the validity or lack of validity in the latter are:
There is a statistically significant relationship between tourism industry and unemployment rates.
The tourism industry in Algeria contributes little to employment.

The rest of this paper was organized as follows: Section 1 provides a literature review on the tourism industry and employment relation. Section 2 discusses the data and the methodology. Section 3 presents the empirical results. Finally, Section 4 concludes the paper.

2- The relation between tourism industry and employment

2.1 The concept of tourism employment

The concept of tourism employment, in accordance with the (Banskota, 2012, p. 176) refers to "employment in the tourism industries refers to all the jobs (or persons engaged) in both tourism-characteristic activities and non-tourism-characteristic activities in all establishments in tourism industries".

It should be noted that persons engaged in tourism characteristic activi-ties of an establishment belonging to a non-tourism industry (e.g., all establishments

whose principal activity is not a tourism characteristic activity) are not included in employment in the tourism industries. On the other hand, persons employed in an establishment belonging to a tourism industry who participate in the establishment's non-tourism characteristic activities are included in employment in the tourism industries (UNWTO, 2019, p. 17).

2.2 Characteristic of employment in the tourism sector

The tourism industries are characterized by diversity both on the basis of intra-national and international criteria and have a major impact on the nature of work in the sector. The range of sub-sectors, the size of businesses, their ownership, the markets they serve illustrate the factors which contribute to determining the range of tasks which are undertaken, the numbers employed and the skills required. It becomes increasingly necessary to take a broad view of the tourism labour market and consider its close links to other labour markets. Cooks, for example, have the whole food sector to choose from, like contract catering, the food processing industry or the retail trade. Likewise, service staff can also use their qualifications and experience in other trades where social skills are essential, e.g. health services. So, people come to tourism with varied backgrounds and professional educations and leave it for a range of other economic activities. The tourism industries thus share the labour market with other trades, and the benefits are – potentially at least – mutual. (Hjalager & Steen, 2001, p. 115).

In general, a labor market consists of all industry sectors, their personnel requirements and skills needs, as well as those currently outside the actual labor force, whether unemployed, temporarily unable to work because of illness or injury, or undergoing specific vocational training or more general preparation for the workforce within the school systems. (Tom, 2008, p. 124).

**Figure n01**: Employment in tourism industries
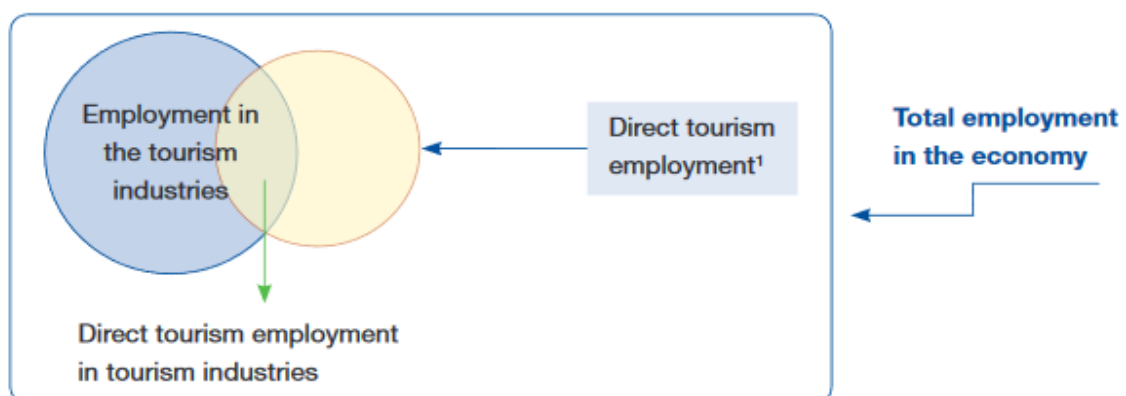
Source: UNWTO.

2.3 The importance of human capital and training in tourism industry

From the different sectors that invest in the human capital, we find that the firms in the service sectors in the top of these firms because all their image depends the service given from the employee to the customer. If the service is good, the customer will be satisfied, if the service is bed, the customer will be unsatisfied, the matter that will distort the image of the firm. These for, it is necessary for the firm to invest in the human capital to keep its image, and to survive for long period. There are six steps in the human capital faction in tourism development as it shown in the figure below   (Benjamin, 2012, p. 282).

Figure n02: Human capital function in tourism development.
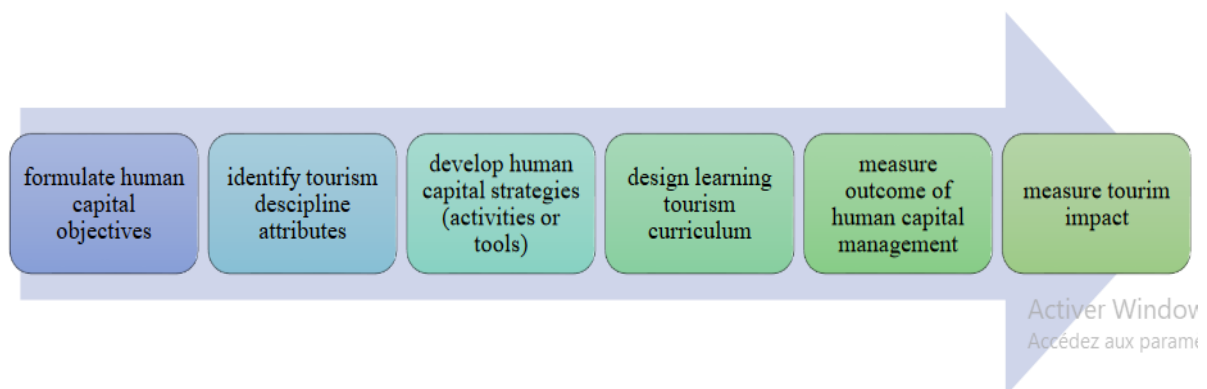
Source: (Bassey Benjamin Esu 2012, P282).

3. The tourism industry in Algeria and its role in employment:
3.1 The contribution of tourism industry in employment

Tourism contributes, directly and indirectly, to creating many jobs and absorbing part of unemployment, given that it increases the employment of part of the factors of production in society, especially the labor component (Ghadban F. b., 2015, p. 247).

Table 01: The contribution of tourism industry in employment for the period 1995 to 2018.

Year	Direct Contribution to Employment	Growth (%)	Share in Total Employment (%)	Total Contribution to Employment	Growth (%)	Share in Direct contribution (%)
1995	218.7	-7,72	4,1	154,7	9,4	2,22
1996	249.6	15,85	4,3	166,3	14,51	2,36
1997	301.3	12,06	4,9	180,5	20,7	2,80
1998	320.7	8,53	5,1	180,4	6,5	2,84
1999	314.8	26,75	5,0	227,5	-1,9	2,43
2000	292,7	-7,72	4,74	154,7	-1,59	2,50
2001	339,1	15,85	5,44	166,3	7,50	2,67
2002	380,0	12,06	5,89	180,5	8,54	2,80
2003	412,4	8,53	6,17	180,4	-0,06	2,70
2004	522,7	26,75	6,70	227,5	26,11	2,92
2005	533,0	1,97	6,63	258,8	13,76	3,22
2006	578,1	8,46	6,52	239,0	-7,65	2,69
2007	552,7	-4,39	6,43	225,4	-5,69	2,62
2008	519,1	-6,08	5,68	227,7	1,02	2,49
2009	597,2	15,05	6,30	269,1	18,18	2,84
2010	543,2	-9,04	5,58	254,0	-5,61	2,61
2011	542,9	-0,06	5,66	266,6	4,96	2,78
2012	617,9	13,81	6,08	289,2	8,48	2,84
2013	678.3	9.78	6.29	321.9	11.31	2.98
2014	645.8	-4.79	6.31	302.2	-6.12	2.95
2015	682.9	5.74	6.45	324.6	7.41	3.06
2016	677.6	0.78	6.25	318.5	-1.94	2.93
2017	678.7	-0.16	6.25	320.1	0.57	2.95
2018	685.0	0.93	6.20	329.5	2.94	2.98

Source: Knoema. (2018)." Algeria-Total contribution of travel and tourism to Employment 1995-2018.www.knoema.com & Knoema. (2018). Algeria-Direct contribution of travel and tourism to Employment 1995-2018.www.knoema.com.

Through the table we note:

• The total contribution of the tourism sector to the level of total employment in Algeria ranged between 4.74% and 6.7% during the period 2000-2018, and its average during the same period was 6.08%, as the total workforce in the tourism sector moved from 292.7 thousand in 2000 to 685 thousand in 2018.

• The direct contribution of the tourism sector to the level of total employment in Algeria ranged between 2.49% and 3.22% during the period 2000-2018, and its average during the same period was 2.82%, as the direct workforce in the tourism sector moved from 154.7 thousand in 2000 to 329.5 thousand in 2018.

• These very low percentages show the weak position occupied by the tourism sector in Algeria within the productive sectors map in relation to its contribution to the level of employment and thus its weak contribution to the fight against unemployment.

• This weak performance of the tourism sector of the Algerian in the absorption of unemployment to several considerations, among them : (Hizaia, Zidane, & Aissani, 2020, p. 12)

＿ Lack of rehabilitation and tourism training encourages investment in the tourism and hotel sector and generates direct and indirect employment.

＿ Lack of tourist accommodation infrastructure and lack of competition due to poor Algerian production and tourism services.

＿ Lack of stability and continuity in programmes and procedures due to officials change.

＿ The seasonality of tourism activity in Algeria, which coincides with the summer period where increasing the number of employees in the tourism activity, but soon this issue deals with the demise of the peak season.

＿ There is no obstacle to investors wishing to invest in the tourism sector, ranging from the obstacles of an administrative, financial and educational, in addition to the hesitation a lot of investors access to this type of investment and length of harvest period on the yield and many of the risks that could be exposed to it the investor.

3.2 Long Term Tourism employment Development Strategy

Studies confirm that career opportunities in the tourism sector to grow nearly double compared to the other sectors, include the international standards adopted from the World Tourism Organization to create a bed, two further hotel (rooms) offset by the expected creation of the position filled immediately and lasting three (03) areas indirectly, on the basis of this index depending on the amplitude of accommodation of the perspective developed in this plan we can measure the quantitative targets in the field of lifting operation are as follows : (Mouhoub, 2020, p. 193)

＿**The first phase, from 2016 to 2019**: create 12.500 jobs immediately and lasting approximately 37.500 jobs indirectly.

 The second phase from 2020 to 2024: create 18.750 position filled immediately and lasting approximately 56.250 jobs indirectly.

 For Phase Three, 2025 to 2029: establishment of 25,000 direct and permanent positions and approximately 75,000 indirect positions.

In the end, will contribute to this plan development to the establishment in the range of 2030 about 56.250 jobs directly and about 168.750 jobs indirectly, bringing the size of the gross operating extracted by this plan to 225.000 position, in other words tourism in Algeria will in the future create on average of 15,000 jobs per annum which is about 1.250 jobs per month.

4. Methodology and data

4.1 Data – Sources and Description

Our study uses an annual time series data covering the period from 1995 to 2018 where we use the empirical model based on Khan and Reinhart (1990), to explore the relative impact of tourism industry on unemployment in Algeria .The data were retrieved from the World Bank database World Bank's World Development Indicators and the World Tourism and Travel Council (WTTC).

The empirical model:This relationship is givenin the long-linear empirical model: $MCH = \alpha + \beta * ET + \varepsilon$ …………………(1)

Where:

MCH :The dependent variable represented by unemployment rates.

ET : The independent variable represented in the percentage of the contribution of tourism employment to the total employment employed nationally,

β, α: represent the model parameters

ε: is the white noise residuals.

4.2 Empirical Results and Discussions

4.2.1 unit root tests: The table below reports Augmented Dickey –Fuller unit root tests for stationarity.

Table 02: ADF unit root tests

Time serie	Level			1st difference			Order of Integrati-on
	constant	constant and trend	Without constant and trend	constant	constant and trend	Without constant and trend	
MCH	-3.00 (0.61)	-3.63 (0.93)	-1.81 (0.28)	-3.00 (0.04)	-3.19 (0.01)	-2.83 (0.00)	I(1)
ET	-2.99 (0.50)	-3.62 (0.39)	-1.95 (0.81)	-3.00 (0.00)	-3.63 (0.00)	-1.95 (0.00)	I(1)

Source: Computed by Authors using Eviews 9.

Note: The null hypothesis is that the series is non-stationary, or contains a unit root denotes the rejection of null hypothesis of unit root at the 1%, 5% and 10% significance levels respectively.

The lag length in the ADF test is based on the Akaike Information Criterion (AIC).

All variables are integrated in the same order we can run an ARDL model.

4.2.2 bounds test for co integration analysis:

Results of the bounds test procedure for co-integration analysis between unemployment rates and tourism employment are presented in the table below.

Table 03: bounds test co integration

ARDL Test Bound		
Test Statistic	Value	K
F- statistic	9.213232	1
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	4.04	4.78
5%	4.94	5.73
2.5%	5.77	6.68
1%	6.84	7.84

Source: Computed by Authors using Eviews 9.

The result show a long-run co integration relationships among the variables at all level 10% 5% 2.5% 1% , It can be seen that the computed F-statistic is above the less bound value.

4.2.3 Results of the Long Run ARDL Model

The long-run ARDL model was estimated based on the Akaike Information Criterion (AIC) .

The optimal lag length based on Akaike Criterion is ARDL (4,4)

Table 04: The long-run ARDL model

Dependent Variable: MCH

Method: ARDL

Variable	Coefficient	Std. Error	t-Statistic	Prob.
(MCH(-1))	0.139785	0.301434	0.463735	0.6528
(MCH(-2))	0.678153	0.348657	1.945044	0.0804
(MCH(-3))	0.206150	0.422934	0.487427	0.6365
(MCH(-4))	-0.327041	0.279245	-1.171164	0.2687
(ET)	-5.414625	2.264082	-2.391533	0.0379
(ET(-1))	-4.246388	2.529107	-1.679007	0.1241
(ET(-2))	0.963733	1.865204	0.516691	0.6166
(ET(-3))	-0.938931	1.498345	-0.626645	0.5449
(ET(-4))	2.140401	1.621518	-1.319998	0.2163
C	43.09754	10.91469	3.948581	0.0027

R-squared	0.989186	Mean dependent var	15.66850
Adjusted R-squared	0.973735	S.D. dependent var	7.191377
S.E. of regression	1.165059	Akaike info criterion	3.450273
Sum squared resid	13.57362	Schwarz criterion	3.948139
Log likelihood	-24.50273	Hannan-Quinn criter.	3.547461
F-statistic	79.32287		
Prob(F-statistic)	0.000000	Durbin-Watson stat	2.435373

Source: Computed by Authors using Eviews 9.

The results of the statistical tests for the regression equation shown in the above table indicate that the high quality of the model estimated through the coefficient of determination $R^2 = 0.98$ which shows that the model explains 98% of the changes in unemployment rates, and the results indicate that the relationship between the dependent variable The explanatory variables are not false, since the F-statistic of Prob (F-statistic) is significantly less than 5%.

4.2.4 Results of the short run dynamic

Table 05: short run dynamic test

ARDL Cointegrating And Long Run Form				
Dependent Variable: MCH				
Cointegrating Form				
Variable	Coefficient	Std. Error	t–Statistic	Prob.
D(MCH(–1))	–.0557262	0.279667	–1.992588	0.0743
D(MCH(–2))	0.120892	0.238471	0.506945	0.6232
D(MCH(–3))	0.327041	0.279245	–2.391533	0.2687
D(ET)	–5.414625	2.264082	0.626645	0.6166
D(ET(–1))	–0.963733	1.865204	–0.516645	0.6166
D(ET(–2))	0.938931	1.498345	0.626645	0.5449
D(ET(–3))	2.140401	1.621518	1.319998	0.2163
CointEq(–1)	–0.302953	0.077297	–3.919315	0.0029
CointEq = MCH–(–38.8727*ET+142.2582)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t–Statistic	Prob.
ET	–38.872748	8.712072	–4.461941	0.0012
C	142.258222	28.909271	4.920851	0.0006

Source: Computed by Authors using Eviews 9.

Results show the following:

First ,The ECMt-1 is equal to -0.3029 and highly significant , that confirms the existence of stable long-run relationship.
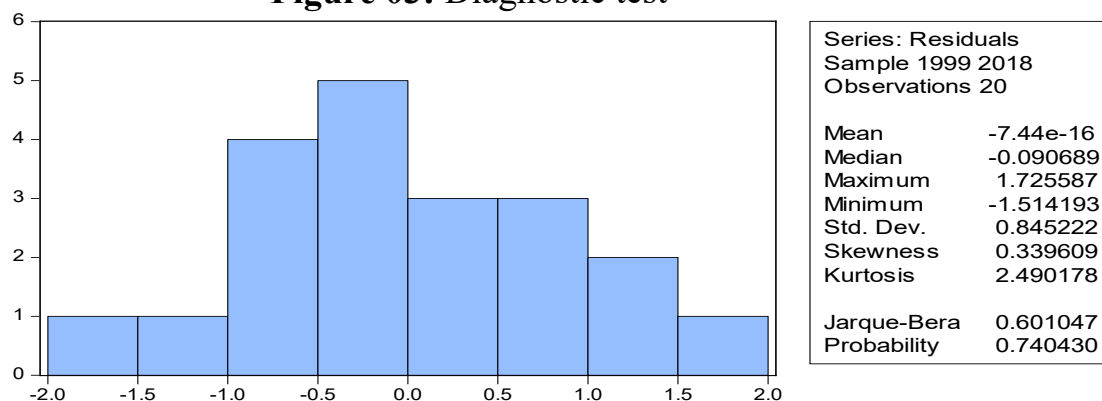
We notice from the above table that the results are similar to the short term, as:

• The tourism employment variable has a negative and significant impect at 1 percent level, as it proves an inverse relationship with the unemployment rate, as an increase in tourism employment of 1% leads to a decrease in unemployment rates by 5.41%.

• For the long-term parameter, the variable of tourism employment, has a statistical significance at 1% (0006). So there is a long-term inverse equilibrium relationship between tourism employment and the unemployment rate, that is, the greater the tourism employment will lead to a decrease in the unemployment rate This reflects the validity of the hypothesis and is consistent with previous studies.

4.3 Diagnostic test:

Figure 03: Diagnostic test

Series: Residuals	
Sample 1999 2018	
Observations 20	
Mean	-7.44e-16
Median	-0.090689
Maximum	1.725587
Minimum	-1.514193
Std. Dev.	0.845222
Skewness	0.339609
Kurtosis	2.490178
Jarque-Bera	0.601047
Probability	0.740430

Source: Computed by Authors using Eviews 9.

Various diagnostic tests on serial correlation and heteroscedassiticity, and normally were conducted to confirm the efficiency of the model .Table (3) reveals that the estimates are free from serial correlation, heteroscedassiticity, and normally distributed).

4.4 CUSUM and CUSUMQ stability tests:

Finally, to demonstrate the structural stability of long-term and short-term relationships we rely on the test proposed by Pro through the the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ), the principle of tests is that If the plot of the CUSUM and CUSUMSQ stays within the 5 percent critical bound the null hypothesis that all coefficients are stable cannot be rejected. This is shown in Figs. 5 and 6. However, the parameters of the model do not suffer from any structural instability.
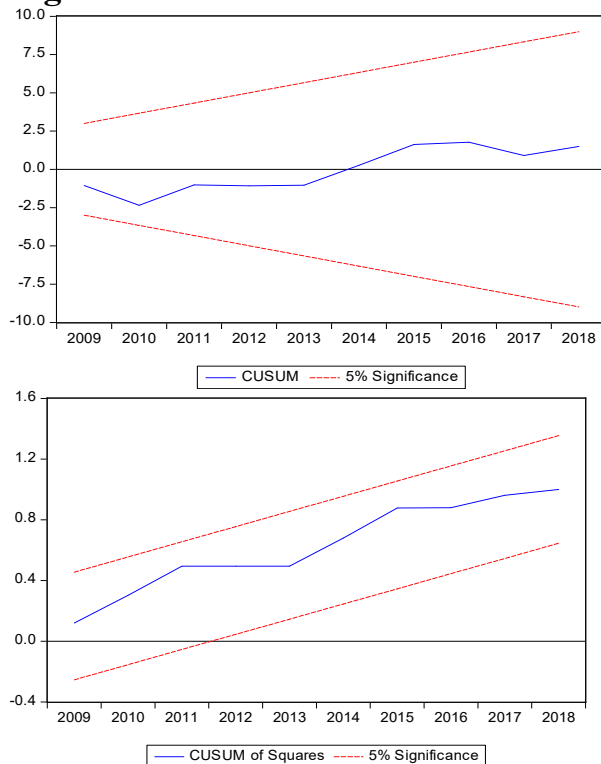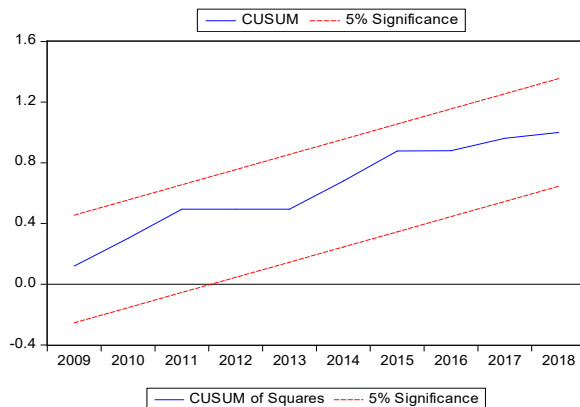
96

Figure n4 :CUSUM test   **Figure n5** :CUSUM of Squares test

Source: Computed by Authors using Eviews 9.

5. **Conclusion**

Based on what was stated in the previous paragraphs of theoretical and practical study, the following conclusions can be drawn:

On the theoretical level

• The total contribution of the tourism sector to the level of total employment in Algeria ranged between 4.74% and 6.7% during the period 2000-2018, and its average during the same period was 6.08%, as the total workforce in the tourism sector moved from 292.7 thousand in 2000 to 685 thousand in 2018.

• The direct contribution of the tourism sector to the level of total employment in Algeria ranged between 2.49% and 3.22% during the period 2000-2018, and its average during the same period was 2.82%, as the direct workforce in the tourism sector moved from 154.7 thousand in 2000 to 329.5 thousand in 2018.

• These very low percentages indicate the weakness of the tourism sector's contribution to employment, the weak position it occupies, and consequently its weak contribution to fighting unemployment, and this is due to the lack of direct tourism projects or assistance to them of various kinds, which have not exceeded 2.5% of the total volume of investments since 2014.

On the practical level

The study employ a advanced econometric technique of Auto-Regressive Distributed Lag (ARDL) bounds testing approach developed by Pesaran et al (2001). The empirical findings obtained :

So first, the study concluded that there is a short-term and long-term relationship between tourism employment that represent the percentage of the contribution of the tourism sector In employment to the total employment employed nationally, and the unemployment rate in Algeria.This means that torism industry positively affects employment in the short- and long-term process.

Finally, regarding the term error correction (ECM) is negative and significant (-0.30), indicating that 30% of the imbalance will be adjusted annually. The CUSUM and CUSUMSQ stability tests indicate that there is a stable long-run relationship between tourism and unemployment rate.

In light of these results obtained, we propose a set of recommendations, perhaps the most prominent of which are:

• Giving greater importance to the tourism sector as a tributary of development and an important economic alternative that would create wealth and provide permanent jobs.

• Providing more credit facilities to encourage tourism investment.

• Supporting and developing training in the tourism sector due to the dependence of the tourism sector to a large extent on the human element, which calls for continuous training and training of human resources working in the tourism sector.

• The development of small and handicraft industries that are directly related to supporting the tourism industry and facilitating the means of establishing them because of the importance they constitute in providing tourism employment.

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