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THE IMPACT OF SECTORAL GROWTH ON ALGERIA'S TOURISM PERFORMANCE

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ABSTRACT

This paper investigates whether sectoral growth (agriculture, manufacturing, service, infrastructure and public works) affects tourism performance (international tourism receipts) in Algeria during the period 1997-2019 before the outbreak of the COVID-19 pandemic. The study relied on the Cointegration test and the Error Correction Model and adopted the reverse causality from the growth-based tourism hypothesis. The findings showed that there are no relationships between sectoral growth in agriculture and manufacturing on the one hand and tourism performance on the other, and there is no effect of service sector growth on tourism performance. However, a low positive impact of the sectoral growth in infrastructure and public works on tourism performance was found. These results indicate that the reverse causality from the growth-based tourism hypothesis is not valid in Algeria. Therefore, Algerian authorities are required to intensify the interaction and integration between various sectors, with a special interest in the tourism industry.

KEYWORDS:

Tourism performance, sectoral growth, agriculture, manufacturing, service, infrastructure and public works

1. Introduction

Economic diversification is a key approach to achieving comprehensive and sustainable economic development, given the necessity of the interaction between different economic activities and the inability of a specific sector alone to conduct comprehensive and sustainable economic development (OECD/WTO, 2019). There is strong convergence that economic concentration generates many imbalances in the long-term that negatively impact the overall macroeconomic aggregates (Kimouche & Charchafa, 2020).

In this context, tourism is an important area of economic diversification due to its links with other economic industries (Brel et al., 2020), such as culture, health, sports, catering, crafts, services, hotel and accommodation, transportation and communications, agriculture, etc. Therefore, tourism can contribute to activating many other related industries integrated into tourism value generation (Kimouche & Charchafa, 2020). Nevertheless, the advancement of tourism initially imposes development in the primary sectors, which improves the country's tourism competitiveness.

As a developing economy, Algeria suffers from highly dependence on the hydrocarbon sector. Revenues from petroleum and gas exports are the major source of gross domestic product (GDP), hard currency, and tax receipts. Furthermore,

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they have been the determinant of socioeconomic development since the hydrocarbon nationalisation in 1971 (ONS, 2021). Algerian authorities tried to adopt some strategies to diversify the economy, such as industrialising industries and the agrarian revolution in the 1970s and 1980s (Bendjeffal & Benabdeli, 2015; Haouas & Lin, 2023). However, these strategies were not effective in reducing the high concentration of the Algerian economy and were abandoned in the 1990s due to the economic crisis in Algeria resulting from the drop in petrol prices and the political and security crisis.

At the beginning of the 2000s, the economic and political conditions in Algeria were ameliorated by the Civil Harmony Law of 1999, which put an end to the civil war (the Dark Decade), in addition to the unprecedented rise in petrol prices. This amelioration allowed Algerian authorities to engage in many ambitious development programmes, where the tourism sector is among the key dimensions, through the Sustainable Tourism Development Plan in 2003 and the Directive Plan for Tourism Development (SDAT 2025) in 2008 (Bouadam, 2011; Zermane et al., 2021). The two programmes reflect the Algerian government's will to put the available resources at the service of the tourism industry as a tool for comprehensive and sustainable development in Algeria (Direction of Tourism and Handicrafts Boumerdes, 2021).

This paper aims to explore the causal relationship between sectoral growth (agriculture, manufacturing, service, infrastructure and public works) and tourism performance in Algeria. The study included 23 years from 1997 to 2019 before the COVID-19 pandemic spread and the accompanied global stagnation of economic activity. The results only found a weak positive impact of sectoral growth in infrastructure and public works on tourism performance, while the impacts of growth in other sectors on tourism performance were insignificant. These results require Algerian authorities to intensify the interaction between various sectors with a special interest in the tourism industry to enhance the diversification of the national economy towards comprehensive and sustainable development.

2. Literature review

Figini & Vici (2010) argue that the literature investigates the relationship between tourism and economic growth through three different levels of theories: Keynesian multiplier theory, international trade theory, and endogenous growth theory. According to Keynesian multiplier theory, tourism is an element of aggregate demand that positively affects economic growth. The increase in spending during economic downturn activates demand, which stimulates supply and then augments employment opportunities and income. Despite the importance of this analysis, which focuses on the effects of the income and employment multipliers that can be generated by tourism, these effects tend to be static in the long-term (Ono, 2011).

Similar to natural resources, international trade theory focuses on the relative advantages and factors explaining them in the tourism production function, providing interpretations for international tourism flows. Also, there is a conclusion that tourism specialisation enhances growth if the elasticity of substitution between tourism and manufacturing is less than one (Anderson, 2008).

Although endogenous growth theory emphasises the leadership of high-tech sectors in enhancing economic growth in the long-term, tourism can play an important role in increasing revenues, given that exports can be a source of economic growth, not only work and capital. Nevertheless, the question is whether tourism leads to motivating economic growth, economic growth drives tourism, or there is a mutual

relationship between the two variables (Howitt, 2010). This question gives rise to four hypotheses: tourism-led growth, reverse causality from the growth-based tourism, neutrality, and bi-directional causality.

The tourism-led growth hypothesis assumes a unidirectional causal relationship from tourism to economic aggregates as a whole, since tourism is a key determinant of economic growth in the long-term (Shahzad et al., 2017). Reverse causality from the growth-based tourism hypothesis states that tourism growth occurs as a result of growth in other sectors, where tourism increases the possibility of generating positive connections with other economic sectors (Ridderstaat et al., 2013). According to the neutrality hypothesis, there is no causal relationship between economic growth and tourism, and the expected mutual effects between them are incidental. Finally, the bi-directional causality hypothesis expects a bi-directional causal relationship between the two variables, and therefore any improvement in one of them will affect the other positively (Rasool et al., 2021).

There are many studies interested in the relationship between tourism and economic growth in different environments. Our literature review includes only studies carried out in Algeria, starting with Mesdoui (2009), who explored the contribution of hotels to promoting tourism in Boumerdes State from 2003 to 2008. The findings indicated that hotels did not contribute as much to promoting tourism as expected due to their small size and budget and their low rating, in addition to cultural factors.

Hamidatou & Hamidatou (2015) investigated the influence of tourism revenues on GDP from 1997 to 2013. The findings suggested a weak influence of tourism revenues on GDP due to the high concentration of the Algerian economy and the high dependence on hydrocarbon sectors.

Benzarour & Satour (2016) analysed the long-term association between tourism performance (gross tourism product, international tourist arrivals, and international tourism receipts) and GDP in Algeria from 1995 to 2014. The results were consistent with the tourism-led growth hypothesis, where international tourism receipts caused economic growth, suggesting a one-way causal relationship.

Bouraoui (2017) studied the influence of foreign investments on tourism development in the Maghreb countries. The results revealed that foreign investments positively affected tourism development in Morocco and Tunisia. However, that effect was insignificant in Algeria, which was explained by the lower flows of foreign non-hydrocarbon investments to Algeria. Further, the findings revealed that tourism positively affected economic growth, with a lower effect in Algeria.

Harrats & Ramdani (2018) explored the association between tourism investment and tourism GDP in Algeria from 1983 to 2016. The findings showed a one-way causality from tourism investment to tourism GDP through increasing receipts.

Khellout & Aici- (2018) analysed the influence of tourism on economic growth in Algeria, Morocco, and Tunisia for the period 1995-2012. They suggested that tourism is a key sector in Morocco and Tunisia as it contributes to pushing economic growth. The results also indicated that tourism performance in Algeria was still far behind that in Morocco and Tunisia since its contribution to economic growth tends to be neglected.

Menacer & Becherair (2019) examined the association between tourism receipts and economic growth in Algeria for the period 1997-2014. According to the findings, no significant relationship was found between the two variables due to the lower tourism investments in Algeria.

Taibi & Lamri (2020) explored the association between tourism (number of tourists) and economic growth in Algeria from 1995 to 2018. The results showed a negative impact of the tourists' number on

economic growth in Algeria, and therefore tourism generates insufficient receipts for the Algerian economy.

Sari Hassoun et al. (2021) investigated the relationship between tourism (international and national expenditure per capita) and economic growth (GDP per capita) in Algeria for the period 1995-2017. Using the vector autoregressive model, the findings showed a significant positive influence of economic growth on tourism, while the impact of tourism on economic growth was insignificant. In the long-term, the results showed a one-way causal relationship from GDP to international and national expenditure, which confirms the reverse causality from the growth-based tourism hypothesis.

Nadjem & Boufeneche (2021) studied the impact of tourism value added on non-hydrocarbon economic growth in Algeria from 1995 to 2018. The findings provided evidence about a relationship between the variables in the long-term without any significant influence of tourism value added on non-hydrocarbon economic growth.

Chehat & Akacem (2022) were interested in the influence of tourism on economic growth in Algeria for the period 1995-2015. The findings suggested no cointegrated vector among the variables, while the error correction models showed a one-way causal relationship between international tourism receipts and economic growth.

Louali (2022) examined the relationships between tourism revenues, real exchange rate, and economic growth in Algeria for the period 1990 to 2019. According to the findings, the relationship between tourism revenues, real exchange rate, and economic growth is unidirectional and causal, where tourism revenues (one lag) and real exchange rate (two lags) positively impact economic growth in the short-run.

Abderzag & Mohamed (2023) examined the determinants of the competitiveness of Algeria as a tourism destination from entrepreneurs' perspectives. Using a sample of 311 entrepreneurs, the results indicated that infrastructure, support services, destination resources, and the business environment significantly influence tourism competitiveness in Algeria.

In the limits of our literature review, we found that the majority of previous studies in Algeria focused on the influence of tourism performance on economic growth (the tourism-led growth hypothesis). Some previous studies focused on the influence of investments (particularly in tourism) on tourism performance. Therefore, we expect that this study is useful for the Algerian context since it explores for the first time the influence of sectoral growth on tourism performance (reverse causality from the growth-based tourism hypothesis).

3. Method and materials

3.1. Model specification

Based on the reverse causality from the growth-based tourism hypothesis, we expected a positive impact of sectoral growth on tourism performance in Algeria. We measured sectoral growth for four classical sectors that highly interact with the tourism industry (agriculture, manufacturing, service, infrastructure and public works). According to Schmidt (1971), the minimum number of subjects per variable to achieve a valid estimate for a linear regression lies in the range of 15 to 20. However, Green (1991) stated that 20 subjects per variable would be preferable. Consequently, we estimated the impacts of the four sectors on tourism performance using four simple linear regressions due to the limited sample size, where the study included the period 1997-2019, which represents a total of 23 subjects. Therefore, the estimation of a linear regression with more than one variable is not valid.

$$TOUR_t = \alpha_1 + \beta_1 AGR_t + \varepsilon_{1t} \quad (1)$$

$$TOUR_t = \alpha_2 + \beta_2 MANF_t + \varepsilon_{2t} \quad (2)$$

$$TOUR_t = \alpha_3 + \beta_3 SERV_t + \varepsilon_{3t} \quad (3)$$

$$TOUR_t = \alpha_4 + \beta_4 IPW_t + \varepsilon_{4t} \quad (4)$$

Where TOUR is the tourism performance; AGR is the agriculture sector growth; MANF is the manufacturing sector growth; SERV is the service sector growth; IPW is the infrastructure and public works sector growth; α is the constant; β is the parameter; ε is the error term.

3.2. Variables measurement

The dependent variable, tourism performance (TOUR), was expressed as the rate of receipts from international tourism to GDP, both with current prices. However, the sectoral growth (AGR, MANF, SERV, IPW) was measured as the rate of change in GDP from each sector separately (agriculture, manufacturing, service, infrastructure and public works) between the beginning and the end of the year expressed by current prices.

3.3. Data source

Data on tourism performance (TOUR) was collected from the World Bank database (The World Bank, 2023) and the World Tourism Organisation database (World Tourism Organisation, 2022). However, sectoral growth was calculated based on the collection statistics No. 221/2021 (Série E: Statistiques Economiques No. 108) provided by the Algerian National Office of Statistics in the table of the nation's production by activity and legal sectors (Production de la nation selon l'activité et le secteur juridique) (ONS, 2021).

3.4. Methodology

In order to estimate the impact of sectoral growth on tourism performance in Algeria, some econometric tests were used to analyse the association between the variables, starting with the stationarity test through the Augmented Dickey-Fuller (ADF). After that, we tested the Cointegration between non-stationary variables by examining the unit root for the standardised residuals resulting from the long-run model estimation. Finally, the Granger causality was examined before estimating the Error Correction Model (ECM). All statistical tests were performed using Eviews (10th version).

4. Results and discussion

4.1. Unit root test results

Since the study data is a time series, estimating the equations of model requires testing the stationarity of the variables (unit root test) and verifying whether they are integrated to the same degree to avoid spurious regressions. Table no. 1 summarises the results of the Augmented Dickey-Fuller (ADF) used to test the stationarity of variables, which indicates that tourism performance (TOUR) as a dependent variable, and service sector growth (SERV) and infrastructure and public works sector growth (IPW) as independent variables are not stationary at the level. Therefore, they contain unit roots, as the calculated statistics were lower than the critical values for each variable.

However, the previous three variables are stationary at the first difference since the calculated statistics were greater than the critical values for each variable, and thus they are cointegrated at the first level. Contrarily, the two other independent variables, agriculture sector growth (AGR) and manufacturing sector growth (MANF), are stationary at the level, which means that they do not contain unit roots, as the calculated statistics are significant at 5% or 1% for each variable.

Table no. 1
Augmented Dickey-Fuller (ADF) Test Results

Variables		At the level			At the first difference		
		None	Intercept	Trend and intercept	None	Intercept	Trend and intercept
TOUR		-0.719	-2.426	-2.388	(-4.782)**	(-4.633)**	(-4.348)*
AGR		(-2.028)*	(-7.905)**	(-7.569)**	-	-	-
MANF		(-3.544)**	(-3.227)*	(-4.384)*	-	-	-
SERV		-0.611	-2.348	-2.176	(-4.705)**	(-4.575)**	(-3.912)*
IPW		-0.271	-2.390	-0.649	(-9.263)**	(-3.165)*	(-10.550)**
Critical values	1%	-2.686	-3.809	-4.498	-2.692	-3.832	-4.572
	5%	-1.959	-3.021	-3.658	-1.960	-3.030	-3.691
	10%	-1.607	-2.650	-3.270	-1.607	-2.655	-3.281

* Significant at 5%
** Significant at 1%

Based on these results, we can exclude two independent variables: agriculture sector growth (AGR) and manufacturing sector growth (MANF) because they are not integrated with the dependent variable (TOUR) at the same level. Therefore, the relationship between these variables will be insignificant or result in a spurious relationship (spurious regression).

4.2. Long-run estimation results

In order to conduct the Cointegration test between different sectors and tourism performance, we estimated the four equations in the long-run. After that, we tested the stationarity of the obtained standardised residuals from that estimation, which indicates the presence of Cointegration between dependent and independent variables.

Table no. 2 summarises the results of the long-run estimation, which indicates that the long-run estimation confirms the results of the unit root test for Equation (1) and Equation (2), indicating the invalidity of the two equations since the F-statistic was insignificant and the determination coefficient was very weak in the two cases. This means that agriculture sector growth (AGR) and manufacturing sector growth (MANF) have no impact on tourism performance (TOUR) in Algeria, so Equation (1) and Equation (2) can be disregarded.

For Equation (3) is insignificant, as the F-statistic value reached 0.184 and was less than the F-critical value, and the level of significance was greater than the 5% level of significance. Therefore, it is clear that the relationship between service sector growth (SERV) as an independent variable and tourism performance (TOUR) as a dependent variable is insignificant. For that, service sector growth did not impact tourism performance in Algeria during the study period.

Table no. 2
Long-run Estimation Results

		Coefficient	Std. Error	t-statistic	F-statistic	Adj. R-squared
Equation (1)	Constant	0.194	0.023	(8.608)**	(0.143)	0.007
	AGR	0.001	0.002	0.378		
Equation (2)	Constant	0.196	0.023	(8.559)**	(0.045)	0.002
	MANF	0.001	0.006	0.211		
Equation (3)	Constant	0.175	0.041	(4.258)**	(0.184)	0.042
	SERV	0.003	0.007	(0.429)		
Equation (4)	Constant	0.083	0.027	(3.109)**	(19.236)**	0.477
	IPW	0.017	0.004	(4.386)**		

Dependent variable: TOUR
** Significant at 1%

Regarding Equation (4), Table no. 2 indicates that the equation is significant at the 1% level, as the F-statistic value reached 19.236 more than the F-critical value, and the level of significance reached 0.000 and was much less than the 1% level of significance. Therefore, infrastructure and public works sector growth (IPW) has a positive impact on tourism performance (TOUR) in the long-run, where the parameter reached 0.017 and was significant at the 1% level of significance.

4.3. Cointegration test results

Table no. 3 shows that the standardised residuals resulting from estimating Equation (3) are not stationary at the level, as the calculated statistics were lower than the critical values, except for the first case, which was significant at 5%, suggesting the absence of Cointegration between tourism performance (TOUR) and service sector growth (SERV). Therefore, service sector growth (SERV) had no impact on Algeria's tourism performance during the study period. Contrarily, the standardised residuals resulting from estimating Equation (4) are stationary at the level since the statistic values were greater than the critical values in all three options, and thus there is a Cointegration between tourism performance (TOUR) and infrastructure and public works sector growth (IPW).

Table no. 3
Cointegration Test Results for Equation (3) and Equation (4)

Standardised residuals		At the level		
		None	Intercept	Trend and intercept
Equation (3)		-2.171	-2.136	-2.155
Equation (4)		(-3.215)**	(-3.144)*	(-3.968)*
Critical values	1%	-2.686	-3.809	-4.498
	5%	-1.959	-3.021	-3.658
	10%	-1.607	-2.650	-3.270

* Significant at 5%
** Significant at 1%

4.4. Granger causality test results

Table no. 4 shows the findings of the causality test between tourism performance (TOUR) and infrastructure and public works sector growth (IPW). The results suggest that the causal relationship from tourism performance (TOUR) to infrastructure and public works sector growth (IPW) is insignificant. However, the inverse causal relationship from infrastructure and public works sector growth (IPW) to tourism performance (TOUR) is significant at 10%, indicating an impact of sectoral growth in infrastructure and public works on tourism performance (TOUR).

Table no. 4

Granger Causality Test Results for Equation (4)

Null Hypothesis:	Observations	F-statistic	Prob.(F-statistic)
IPW does not Granger Cause TOUR	21	4.705	0.065
TOUR does not Granger Cause IPW		1.530	0.342

The Granger causality test for Equation (4) that suggests a causal relationship from infrastructure and public works sector growth (IPW) towards tourism performance (TOUR) requires estimating the Error Correction Model (ECM) for Equation (4), where the results are summarised in Table no. 5. The results show that an increase in sectoral growth in infrastructure and public works (IPW) by 1% leads to an increase in tourism receipts by 0.011%. Although the regression is significant at the 5% level, the impact of sectoral growth on tourism performance (TOUR) is weak, as supported by the determination coefficient, which attained 21.60%. These results indicate that the reverse causality from the growth-based tourism hypothesis is not valid in Algeria.

Table no. 5

ECM Estimation Results

		Coefficient	Std. Error	t-statistic	F-statistic	Adj. R-squared
Equation (4)	Constant	0.003	0.010	(0.260)		
	IPW	0.011	0.005	(2.381)*	(3.613)*	0.216
	E(-1)	-0.545	0.246	(-2.217)*		

Dependent variable: TOUR

* Significant at 5%

5. Conclusion

Achieving economic diversification requires integration between economic sectors as an effective strategy towards comprehensive and sustainable development. Therefore, giving more interest to the tourism sector falls within this perspective by activating the mutual interaction between tourism and the traditionally leading economic development sectors. This enables tourism industry to serve economic sectoral growth in other industries or benefit from the infrastructure and advantages that other sectors provide to enhance tourism's competitiveness. From this view, this paper tried to investigate the causal relationship between tourism performance and sectoral growth in Algeria, assuming a positive impact of sectoral growth in agriculture, manufacturing,

service, infrastructure and public works on international tourism receipts.

The study included previously cited variables during the period from 1997 to 2019, before the outbreak of the COVID-19 pandemic, which has globally stagnated economic activity. According to the results, the impact of sectoral growth in agriculture, manufacturing, and service on tourism performance was not significant. However, a weak positive and significant impact of sectoral growth in infrastructure and public works on tourism performance was found. Therefore, the study hypothesis was rejected, indicating that sectoral growth had no significant impact on Algeria's tourism performance from 1997 to 2019.

The results of this study confirm the findings of Mesdoui (2009) that hotels did not contribute to promoting tourism, as well as the findings of Bouraoui (2017) that the effect of foreign investments on tourism development was insignificant in Algeria. They also align with the findings of Menacer & Becherair (2019), who showed that the relationship between tourism performance and economic growth was insignificant.

The results of this study contradict the findings of Sari Hassoun et al. (2021), who showed a positive influence of economic growth on tourism, and the findings of Chehat & Akacem (2022), who suggested a one-way causal relationship between international tourism receipts and economic growth. Our results also contradict the findings of Abderzag & Mohamed (2023), who found that infrastructure, support services, destination resources, and the business environment significantly influence tourism competitiveness in Algeria.

These results can be attributed to the weak performance of Algeria's tourism sector as a result of the lack of a predefined strategy and lower investments in tourism, particularly non-government investments. Furthermore, there is a weak interaction between tourism and other industries and a lack of interaction between the development strategies of different sectors, where the development in other sectors is oriented to serve macroeconomic and social objectives without taking into account the needs of the tourism sector. Accordingly, these results require Algerian authorities to intensify the interaction and integration between various sectors, paying special attention to the tourism industry to enhance the diversification of the national economy towards comprehensive and sustainable development.

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