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An Assessment of the Impact of the Tourism Sector on Regional Economic Development in Gauteng Province, South Africa

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Abstract

South Africa is facing three main developmental problems, including high levels of poverty, unemployment, and inequality. The tourism sector allows for a relatively easy entry into the local market for small businesses and entrepreneurs and has the potential to create jobs and subsequently, income. Tourism development could be utilised as a driver for economic growth and development. The main objective of this research was to assess the impact of the tourism sector on economic growth and development in South Africa, focusing on the Gauteng Province which, is the economic hub of the country and even Africa. The methodology utilised was based on a quantitative design, using secondary time series pooled panel data approach including, all the municipal entities in the region. Annual data from 2000 to 2019 were used to analyse the impact of tourism on economic growth and development. Tourism variables include measurements such as tourism spending and international tourism trips. Results confirm the tourism-growth nexus and the sector allows ease of market entry for small businesses, resulting in employment creation and income for the poor in developing regions if promoted via effective policy implementation, even in regions where tourism is not the leading sector.

Keywords: economic development, economic impact, Gauteng region, South Africa, tourism

1. Introduction

Tourism is an important economic sector and contributes 10.4% of global GDP; one in ten jobs are provided via tourism; and 1.4 billion international trips are completed per annum [1]. Globally nearly 60 percent of the population lives in poverty [2], and this number is expected to increase as a result of COVID-19. South Africa has some of the highest levels of poverty, unemployment, and even income inequality. These factors are often obstacles to sustainable economic growth. Within the context of this study, tourism could be defined as all types of travel activities and affects local communities through the environment, employment, and social systems [3]. People living in poverty have limited choices due to a lack of knowledge, opportunities, and skills and find it difficult to exit the poverty trap [4].

Within this context of growing unemployment and poverty, tourism as an economic sector is widely accepted as a sector that could help marginalised and disadvantaged regions achieve higher growth levels with more employment opportunities [5]. As an economic sector, tourism is one of the leading sectors and a fast-growing sector [6]. However, COVID-19 has had a massive impact on tourism on a global scale. As an industry, tourism acts as an export industry, attracting foreign income into the receiving region and is, therefore, the main source of income for many poor developing regions [7]. Traditional economic sectors such as mining and manufacturing have in recent decades struggled to contribute significantly to poverty reduction and employment, and tourism has proven to be able to play that role in developing regions [8]. Samini, Sadeghi, and Sadeghi [9] go as far as to state that tourism could act as a driver or engine of growth as the sector creates employment opportunities, which could lead to more disposable income and increases in government tax revenues [9, 10]. Growth in the sector will result in the diversification of regional and local economies, which is especially important for regions that have focused economies dominated by single resource sectors. These economies are vulnerable to economic and other shocks [11]. The diversification of such economies could minimise the impact of shocks. According to Pedrana [11], the tourism sector could drive investment, allow for employment opportunities, facilitate the inflow of money, and contribute to infrastructure development.

Despite acknowledging the importance of tourism for economic growth and development, the sector is still ignored as an important economic sector due to lack of data and reporting [12, 13]. Phiri [14] states that due to limited data and subsequent limited quantitative academic research, the exact impact of tourism as an economic sector on economic growth and development, especially in developing regions and nations, are limited. In the South African context, it is needed to determine the impact of tourism activities on growth and development [15]. For this reason, the focus of this study is on the economic hub of South Africa and even Africa, the Gauteng province, which is situated in central South Africa and includes cities such as Johannesburg, Pretoria, and Soweto. The region is the only major metropolitan region in the world not located next to an ocean or major river system. This study's contribution is found in the qualitative and quantitative analysis of the dynamic impact of tourism on regional economies using panel data in a developing region.

2. Literature review

This section of the study consists of three parts: an explanation of concepts and definitions, a theoretical foundation, and results from other empirical studies. In terms of concepts and definitions, tourism is defined as people travelling from one region or place to another for more than one night for reasons including holiday, recreational and sports, cultural, medical, and business activities [11]. According to [1] tourism is a multidimensional concept and linked to many economic activities and consists of individuals, communities, businesses, and organisations as well as places that collaborate to provide a tourist experience. Tourism could facilitate employment opportunities for all and even for people with lower levels of education [5].

As this study investigates the links between the tourism sector and regional economic development, the concept of regional economic development is also defined. Stimson, Stough, and Roberts [16] provide comprehensive definitions of regional economic development supported by other researchers. They state that regional economic development is a similar concept if compared to economic development, but on a regional scale. They list the following components of the concepts: regional economic development is a process where regional stakeholders including business,

communities, and local government attempt to stimulate economic opportunities through the involvement of all economic sectors, employment and quality of life. According to Stimson et al. [16] the regional economic development process includes policy formulation, planning, analysis, strategy development, and resource application; while regional economic development product includes employment, wealth creation, investment, infrastructure development, and quality of life.

This section contains empirical results on the relationship between the tourism sector and regional economic development. Rosentraub and Joo [17], over three decades, assessed several metropolitan regions across the world where investments have been made to attract larger numbers of tourists and human capital. Key results from this research indicate that sports and amusement-related tourism activities allow for most gains and benefits for regional development. Some authors [18] analysed the linkages between the tourism industry and economic development processes. The study focused on regional economic development, investigating the importance of tourism geography's economics and the increasing significance of networks and new information and communication technologies. Tourism complexity and economic development's role is essential, and the importance of the term 'glocal' in tourism development processes.

From a European perspective, authors such as [19] assessed tourism's contribution to regional economic resilience in Europe. The results confirmed the significance of tourism as a factor of regional economic resilience. Furthermore [20] assessed domestic and international tourism's impact on the regional economic growth for 179 European regions from 1999 to 2009 using GDP per capita as the dependent variables with other variables such as human capital, technological capital, institutional and social features of the regions. The final results established both domestic and international tourism do positively affect economic growth. Dana, Gurau, and Lasch [21] analysed the potential of two regions regarding tourism in rural areas as a source of entrepreneurship opportunities supporting regional economic development in rural, regional France. According to Alberti and Giusti [22], tourism plays a major role in regions' economic development and competitiveness. This paper assesses the clustering of tourism and cultural heritage activities that could lead to regional competitiveness in the Motor Valley cluster in Italy from 1999 to 2011. This region is globally known for its motorsport industry, with firms involved in this industry since 1800 in facilities, institutions, cultural heritage, museums. All role players collaborate, leading to competitiveness in regional tourism. The study results confirmed the importance of establishing clusters focused on tourism interlinked with a cultural heritage for regional competitiveness. Cortes-Jimenez [23] analysed the role of tourism on regional economic growth in regions of Spain and Italy using panel data econometric methods. The results indicate that tourism through both domestic and international tourism contribute positively to regional economic growth. However, it should be noted that the impacts and patterns of impacts on regional development differ from region to region.

Vieira and Santos [24] examined the role of tourism for regional economic development in Portugal in terms of spatial interrelations between municipal regions. Results indicate significant spatial interrelations between and across the various municipalities and that spatial tourism clustering occurs in coastal locations. Besides, tourism was confirmed via an econometric analysis as a significant driver of regional economic development. Petrevska and Manasieva Gerasimova [25] analysed the impact of tourism on regional economic development in the south-western section of Macedonia, focusing on tourism flows, the capacity of tourism accommodation, and tourism spending from 2003 to 2010. Findings from the analysis are that this region is a leading region in Macedonia but still needs to achieve its potential. This situation exists due to limited policy formulation and implementation. Surugiu

and Surugiu [26] studied the relationship between the tourism sector and economic growth in Romania from 1988 to 2009 using econometric cointegration Granger causality methods, vector error correction model (VECM), and impulse response functions. The findings show that tourism expansion does granger cause economic growth. Results from this study place a focus on the requirement for effective tourism development strategies. Fundeanu [27] analysed the role of tourism clusters in the south-west Oltenia region, looking at tourism potential, tourism diversity, strengths, and weaknesses of the region. The study found that tourism clusters are catalysts for regional development, and the competitive advantages of such clusters should be the focus of public policies and strategies.

Gunderson and Ng [28] studied the impact of tourism on regional development in the rural USA. Tourist spending could result in increased demand for regional goods and services, eventually leading to employment creation and an increase in disposable income. The results indicate that public policy effectiveness, sustainable natural resource management, and community development could allow for tourism development and regional development. Tourism positively affects regional economic performance. Klytchnikova and Dorosh [29] analysed the role of tourism on regional economic development in Panama's poor regions using a social accounting matrix model. The paper used the impact of tourism spending on growth and poverty at the regional level. The results indicate that tourism has a large impact on the regional economy and is also an important multiplier in the local economy. The sector also allows for important benefits to the poor. Mishra, Rout and Mohapatra [30] considered tourism an important sector to promote regional economic growth and analysed the import of India's sector from 1978 to 2009 using econometric methods. Time-series econometric models were used for the analysis from 1978 to 2009. The results indicate the existence of unidirectional causality running from tourism activities to economic growth.

Wen-li [31] analysed the impact of tourism on economic growth in regional China since the 1990s. The study results indicate a significant impact of tourism on regional economic growth and allow for diversified and balanced development. He and Zheng [32] analysed the Sichuan region from 1990 to 2009 in China and the tourism sector's impact with abundant resources on the regional economy. Over the last decade, the contribution of tourism to the provincial GDP has been increasing annually. Results indicated that a bi-directional relationship exists between tourism development and economic growth. Yang, Fik, and Altschuler [33] analysed tourism-related economic multipliers from regional input-output tables for 30 Chinese provinces looking at tourism variables, including income, employment, and employment multipliers. Interesting findings reveal that the output and employment multipliers of tourism are positively associated with regional economic development.

Rogerson [34] states that uneven development is a reality of South Africa's spatial economy's structure with leading and lagging regions. Tourism has been identified as a vital economic sector for regional development. This paper assesses the 23 distressed regions in dire need of economic development. These regions rely mostly on domestic tourism, and local natural assets should be maximised with effective policy implementation. Meyer and Meyer [8] conducted a study using regional tourism statistical data from 2001 to 2013 for two geographical areas in a developing region in South Africa. The results indicate that tourism in these regions has a significant impact on economic growth as the sector does include low skilled workers in a labour-intensive industry and allows for a range of benefits for regions that include employment and income.

Lastly, the tourism sector could also have negative impacts, especially on the environment and sustainable development. Effective policies should be in place to allow for strategies to prevent the environment's deterioration [35]. Pedrana [11] believes that tourists could negatively affect local cultures. These negative impacts could be

minimised with local community involvement and if local partnerships and cooperation exist between the private and public sectors. The tourism industry could play an important role in protecting the social and cultural integrity of a community [36].

3. Methodology

The research methodology is based on a quantitative analysis using both descriptive and econometric methods to achieve the primary objective. In this study, the tourism sector's impact on a developing region is analysed using secondary data from Global Insight [37]. Annual data from 1996 to 2019 were used and analysed firstly utilising trends and correlation analysis and secondly by using a pooled econometric panel approach including the five municipal areas (see **Figure 1** for details) in the Gauteng province in South Africa. Gauteng province comprises of the following municipal regions:

- The city of Johannesburg, Metropolitan region (COJ)
- City of Tshwane, Metropolitan region (COT)
- Ekurhuleni, Metropolitan region (EKR)
- Sedibeng district municipal region (SDM)
- West Rand district municipal region (WRDM)



Figure 1.
Gauteng municipal regions. Source: https://en.wikipedia.org/wiki/List_of_municipalities_in_Gauteng

The variables used in the panel econometric analysis consisted of GDP per capita representing economic development and growth as the dependent variable, with the following independent variables: gross value added (GVA) in the tourism sector; the number of jobs in the tourism sector; spending per capita in the tourism sector; and the number of international trips to the region. The panel data for the Gauteng region were analysed using a multiple regression. A multiple regression includes many variables to predict changes in the dependent variable [38]. All of the variables were converted into natural logarithms. The variables were set as follows with the abbreviations as used:

Dependent variable (Y) = Economic development and growth (GDPC – the log format LGDPC)

Independent variables (X):

- Gross value added in the tourism sector (GVAT – the log format LGVAT)
- Number of jobs in the tourism sector (JOBST – the log format LJOBST)
- Spending per capita in the tourism sector (SPENDT – the log format LSPENDT)
- Number of international tourist trips (INTTT – the log format LINTTT)

Pedroni [39] formulated Eq. (1) represents the basic model for the panel data analysis:

$$Y_{it} = a_i + \delta_i t + \beta_i X_{it} + e_{it} \quad (1)$$

Where:

Y_{it} = Dependent variable.

a_i = Intercept term.

δ_i = Parameter that, together with a_i allows the individual linear trends and individual effects to be observed respectively [6].

$\beta = k \times 1$ vector of parameters that were estimated based on the explanatory variables.

$X_{it} = 1 \times k$ vector of observations of the explanatory variables, $t = 1, \dots, T$; $i = 1, \dots$

In this econometric analysis process, several models were used to test for long and short-run relationships between variables: (1) unit root tests to determine the level of stationarity of the variables and model selection; (2) long-run relationships between the variables using either a panel ARDL or Fisher-Johansen cointegration test leading to regression analysis using FMOLS and DOLS equations; (3) Granger causality test to assess causality between all the variables; (4) and model stability diagnostic tests. To simplify the analysis of results from all tests and to place all variables on the same scale, all variables were converted into the natural logarithm format. A panel data set was created for the five municipal regions within the Gauteng Province with 120 observations. Eq. (2) represents the basic equation for pooled panel data econometric models, as proposed by Brooks [40]:

$$y_{it} = \alpha + \beta x_{it} + u_{it} \text{ and } i = 1, \dots, N; t = 1, \dots, T \quad (2)$$

Where y_{it} is the dependent variable, α is the intercept term, β is a $k \times 1$ vector of parameters to be estimated on the explanatory variables, and x_{it} is a $1 \times k$ vector of

observations on the explanatory variables, $t = 1, \dots, T$; $i = 1, \dots, i$ denotes countries in the panel and t denotes time dimension. The i subscript denotes the cross-section and t the time series. The model from the function described in Eq. (1) can be listed as follows in Eq. (3):

$$LGDPC_t = \alpha_1 + \sum_{j=1}^k \beta_{1j} LGDPC_{t-j} + \sum_{j=1}^k \lambda_{1j} LGVAT_{t-j} + LJOBST_{t-j} + LSPENDT_{t-j} + LINTTT_{t-j} + u_{1t} \quad (3)$$

Where α_n is the constant, β_n , λ_n are the coefficients, K is the number of lags, and u_{1t} and u_{2t} are the stochastic error terms, which are also known as shocks in the model. The following tests were used to determine the stationarity level for all the variables: Im, Pesaran and Shin W-stat test; the ADF - Fisher Chi-square test; and the PP - Fisher Chi-square test. Model selection was based on the unit root results. Stationarity of all variables at levels or $I(0)$, a panel VAR analysis would be estimated. In contrast, if all variables were stationary at 1st difference or $I(1)$, the Fisher Johansen panel cointegration test for long-run relationships should be estimated. Lastly, if a mixture of variables were presented, the optimal option would be a panel ARDL method as an estimation.

4. Results and discussion

4.1 Descriptive analysis

As mentioned earlier, the focus area selected for this study is the Gauteng Province in South Africa. This region was chosen due to the following reasons. Firstly, it is the economic hub in South Africa and the African continent; secondly, it is rich in cultural and historical places and events. The region is the largest metropolitan region in the world not located adjacent to the ocean or a major water body. Based on the aforementioned information, this research study's main objective is to assess the dynamic economic impact of tourism on the Gauteng province, using both descriptive and time-series approaches.

In terms of the descriptive analysis, eight key variables were selected as indicated in **Table 1**, to compare the five municipal regions with the total Gauteng province. Variables were analysed regarding growth rates, trends, and contributions to the study region. The different descriptive variables are analysed individually. Firstly, the GDP at constant prices is analysed. The Gauteng province had strong economic growth from 2009 to 2014 of 3.1% per annum, but growth has been low and slow from 2014 to 2019 at 1.1%. The COJ contributed the most to the provincial GDP of 44%, followed by the COT. The two peripheral regions of SDM and WRDM only contributed 4% and 3.8% to the province. The COT had the highest annual growth rate of 1.3% from 2014 to 2019. Secondly, Gauteng has a declining situation regarding GDP per capita with a negative growth rate of -1.2% from 2014 to 2019. Of the five municipal areas, both COJ and COT had much higher GDP per capita values and negative growth rates. SDM had the lowest GDP per capita at less than half of the two leading regions, namely COJ and COT. Thirdly, in terms of population density, Gauteng province had a density of 649 per sqkm and has an increased rate of 2.8% per annum. COJ and EKR metros had the highest densities of 2630 and 1562, with high levels of increases. The two more rural regions of SDM and WRDM have much lower at 208 and 176,

Variables	Year	COJ	COT	EKR	SDM	WRDM	Total Gauteng
GDP at constant prices (R million)	2009	412238	250160	176621	38031	45544	922596
	2014	465263 (2.6)	302464 (4.2)	208049 (3.6)	43682 (2.9)	43870 (−0.7)	1065330 (3.1)
	2019	493223 (1.2)	321164 (1.3)	215681 (0.7)	44852 (0.5)	42004 (−0.9)	1116927 (1.1)
GDP per capita	2009	101171	92190	59140	42686	57163	80489
	2014	97276 (−0.8)	95823 (0.8)	61371 (0.8)	45353 (1.3)	52188 (−1.7)	80965 (0.1)
	2019	90851 (−1.3)	90325 (−1.2)	57141 (−1.4)	43132 (−0.9)	47211 (−1.9)	76040 (−1.2)
Population density (People per sqkm)	2009	1871	321	1178	174	153	483
	2014	2270 (4.3)	386 (4.1)	1375 (3.3)	190 (1.8)	164 (1.4)	569 (3.6)
	2019	2630 (3.2)	445 (3.1)	1562 (2.7)	208 (1.9)	176 (1.5)	649 (2.8)
Jobs in the tourism sector	2009	48465	26388	27212	4415	7815	114295
	2014	55497 (2.9)	30903 (3.4)	32730 (4.1)	6098 (7.6)	7984 (0.43)	133213 (3.3)
	2019	60436 (1.8)	37722 (4.4)	38591 (3.6)	6298 (0.7)	9117 (2.8)	132155 (2.8)
Disposable income (R million)	2009	217674	146803	128552	29777	30830	553637
	2014	238950 (1.9)	170929 (3.3)	146191 (2.7)	35471 (3.8)	33702 (1.9)	625246 (2.6)
	2019	256716 (1.5)	185860 (1.8)	157971 (1.6)	39085 (2.1)	36034 (1.4)	675669 (1.6)
International tourism trips as a ratio to total trips	2009	0.22	0.20	0.21	0.20	0.25	0.21
	2014	0.26 (3.6)	0.24 (4.0)	0.27 (5.7)	0.25 (5.0)	0.32 (5.6)	0.25 (3.8)
	2019	0.33 (5.4)	0.30 (5.0)	0.34 (5.2)	0.32 (5.6)	0.39 (4.4)	0.32 (5.6)
Tourism spending per capita	2009	5613	5043	3818	1769	2324	4483
	2014	7278 (5.9)	7022 (7.9)	5385 (8.2)	2657 (10.1)	3559 (10.6)	6151 (7.5)
	2019	7356 (0.2)	7165 (0.4)	5730 (1.3)	2717 (0.45)	3986 (2.4)	6360 (0.7)
Tourism GDP per capita	2009	5934	5374	4030	1857	2513	5376
	2014	5898 (−0.1)	5681 (1.2)	4307 (1.4)	2131 (2.9)	2628 (0.9)	5198 (−0.7)
	2019	4708 (−4.0)	4527 (−4.1)	3583 (−3.4)	1687 (−4.2)	2210 (−3.2)	4558 (−2.5)

Source: [37]. Note: () brackets contain annual growth percentages between observations.

Table 1.
Descriptive analysis of municipal regions in Gauteng Province.

respectively. Fourthly, in terms of tourism jobs, Gauteng had 132 155 people working in tourism with a growth rate of 2.8% per annum. Compared with the five sub-regions, COJ contributes most with 39% of total jobs in the province, followed by EKR with 25% and COT at 24%. COT and EKR had the highest growth rates in jobs per annum of 4.4% and 3.6%, respectively.

Regarding disposable income, the Gauteng province has been increasing at 1.6% since 2014 in line with the slow growth of GDP growth. COJ again contributes most regarding the income of 38% of the total provincial income, followed by COT at 27%. SDM had the highest increase income of 2.1% coming from a low base, while the increase in income for the rest of the municipal regions had low growth rates of between 1.4–1.8%. Next, the international tourist trips are analysed as a ratio of total tourism trips to the regions. The WRDM had the highest ratio of 0.39, followed by EKR with a ratio of 0.34. All of the regions had relatively high growth rates of above 4.4% per annum. Tourism spending per capita for Gauteng province showed high growth levels from 2009 to 2014 at 7.4%, but as with the rest of the economy did the tourism sector also show much lower spending at 0.7% per annum since 2014 2019. COJ and COT had higher tourism spending per capita than the provincial values, with low growth rates of 0.21% and 0.4%, respectively. The three metro regions had much higher tourism spending levels if compared to the two more rural regions. By far, the WRDM had the highest increase in tourism spending per capita of 2.4% per annum since 2014. Lastly, the GDP per capita analysis indicates negative growth rates of – 2.5% per annum from 2014 to 2019, while only COJ has slightly higher tourism spending per capita than the province. As with the provincial growth rates, all of the municipal regions also had negative growth rates of –3.18% to –4.17%.

Table 2 indicates the correlation coefficients for the variables included in the econometric analysis. GDP per capita has a positive and significant relationship with all other variables, with GVA in the tourism sector with the highest coefficient of 0.93, followed by disposable income at 0.83. The two variables with the highest shared

Variables	GDPper capita	Disposable income	Pop density	GVA in tourism sector	Jobs tourism sector	Int tourism trips	Spending in tourism per capita
GDP per capita	1.0000						
Disposable income	0.8314	1.0000					
Pop density	0.5214	0.8374	1.0000				
GVA in tourism sector	0.9291	0.9414	0.7064	1.0000			
Jobs in tourism sector	0.7318	0.9506	0.8754	0.8630	1.0000		
Int tourism trips	0.7943	0.9329	0.8362	0.9150	0.9733	1.0000	
Spending in tourism per capita	0.7017	0.8609	0.6326	0.7965	0.9020	0.9112	1.0000

Table 2.
Correlation coefficients analysis.

coefficient are jobs in the tourism sector and international trips of 0.97, followed by jobs in the tourism sector and disposable income with a coefficient of 0.95.

4.2 Econometric analysis

Table 3 illustrates the results obtained from the unit root testing. Unit root tests are the first step before cointegration estimations are completed. The reason for this important step is to prevent the use of non-stationary variables, as this may produce spurious results [41]. Unit root tests also assist in the selection of the final long-run estimation model. This analysis results reveal that all variables are non-stationary at levels $I(0)$, while all variables become stationary at 1st difference. Based on the unit root test results, it could be concluded that the Fisher - Johansen panel cointegration test should be utilised to assess the long-run relationships between the variables as all variables are stationary at the same level or at 1st difference.

The next step in the process was to determine the direct nexus between the independent variables and GDP per capita, which was used as a proxy for economic development. The Fisher - Johansen panel cointegration test was utilised as this test is most suitable when all variables are of order $I(1)$. The results are presented in **Table 4**. The Fisher - Johansen cointegration test is used to test for long-run cointegration. [6] define cointegration as the systematic co-movement between variables in the long-run. The results indicate that the Trace and Max-Eigen tests provide evidence of a cointegrating relationship between the variables, at a 1 percent significance level. It could be concluded that the results obtained from the Fisher - Johansen cointegration test confirm a long-run equilibrium relationship between tourism and economic growth. The subsequent step is to determine the exact impact of tourism on economic growth in the study region.

The Fisher - Johansen test indicates a long-run relationship between the variables. This relationship needs to be confirmed, and the strength of the various relationships between the variables need to be established via a regression analysis with coefficients. For this purpose, the two types of estimation methods utilised are the Fully Modified Ordinary Least Squares (FMOLS) and the Dynamic Ordinary Least Squares (DOLS) models. A consideration of various forms of residual-based panel method results indicate that these models generally out-perform single-equation estimation techniques [39]. Firstly, the results of both the FMOLS and DOLS models are listed in **Table 5**. With LGDPC as the dependent variable, the FMOLS model results indicate that all of the independent variables are significant and positive predictors of GDP per capita (LGDPC) at a significance level of 1%,

Variables	Levin, Lin and Chu test		Im, Pesaran and Shin W-stat		ADF - Fisher Chi-square test	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
LGDPC	0.1036	0.0001*	0.1515	0.0001*	0.1534	0.0002*
LGVAT	0.1394	0.0008*	0.7478	0.0001*	0.8529	0.0003*
LJOBST	0.0305**	0.0001*	0.7798	0.0003*	0.8116	0.0001*
LSPENDT	0.9484	0.0045*	0.9478	0.0175**	0.9723	0.0074*
LINTTT	0.0005*	0.0427**	0.3174	0.01311**	0.5237	0.0031*

Null hypothesis: Unit root.
*indicates 1% statistically significant.
**indicates 5% statistically significant.
Source: own elaboration.

Table 3.
Panel unit root tests: P-values.

Hypothesised No. of CE(s)	Fisher Stat. (from trace test)	Probability	Fisher Stat. (from max-eigen test)	Probability
None	185.6	0.0001*	121.40	0.0004*
At most 1	93.04	0.0003*	44.46	0.0007*
At most 2	57.05	0.0005*	49.02	0.0000*
At most 3	19.89	0.0303	14.47	0.1527

* indicates variables are statistically significant at 1% and ** at 5%.

Table 4.
The Fisher - Johansen panel cointegration test.

Method	Variables	Coefficient	Std. Error	t-statistic	Prob.
FMOLS	LGVAT	0.8796	0.0854	10.2886	0.0001*
	LJOBST	0.2328	0.0535	4.3463	0.0003*
	LSPENDT	0.4473	0.0862	5.1881	0.0002*
	LINTTT	0.0993	0.0805	1.2328	0.2212
DOLS	LGVAT	0.8609	0.1315	6.5432	0.0001*
	LJOBST	0.2963	0.1014	2.9219	0.0139*
	LSPENDT	0.1740	0.1589	1.0952	0.2968
	LINTTT	0.4196	0.0999	4.2001	0.0015*

* indicates variables are statistically significant at 1% and ** at 5%.

Dependent variable: LGDPC.

Independent variable: LGVAT; LJOBST; LSPENDT; LINTTT.

Table 5.
FMOLS and DOLS results.

except for international tourist trips (LINTTT). GVA in tourism (LGVAT) has the highest coefficient of 0.88, meaning that a 1% increase in LGVAT could increase by an increase of 0.88% in GDP per capita. Spending on tourism (LSPENDT) has the second-highest coefficient of 0.45, followed by the number of jobs in tourism (LJOBST) with a coefficient of 0.23.

Similar results have been estimated using the DOLS method. The only major difference between the two methods is that only spending on tourism (LSPENDT) is not a significant predictor of GDP per capita for the DOLS model. At the same time, international tourist trips are, however, a significant predictor. Similar coefficients were estimated for both models. This analysis's results are that all the variables could be accepted as significant predictors of GDP per capita. Paci and Marrocu [20] found similar results in that both domestic and international tourism positively influences regional economic growth. Alberti and Giusti [22] also found a positive relationship but added that if all regional role players collaborate, it could lead to more competitiveness in regional tourism.

Table 6 presents the results of the pairwise Granger-causality tests indicating short-run relationships. The purpose of the Granger causality test is to determine which variable causes changes to any of the other variables in the model [42]. The focus of the analysis is on the dependent variable, namely GDP per capita. The results indicate that changes in GVA in tourism impact GDP per capita, while GDP per capita does cause changes in both jobs in tourism and spending in tourism. No causality was detected between GDP per capita and international tourist trips. Causality between other variables excluding the official dependent variable allows

Null Hypothesis:	Obs	F-Statistic	Prob.
LGVAT does not Granger Cause LGDPC	110	7.4393	0.0010*
LGDPC does not Granger Cause LGVAT		0.1007	0.9043
LJOBST does not Granger Cause LGDPC	110	0.5872	0.5577
LGDPC does not Granger Cause LJOBST		7.4212	0.0010*
LSPENDT does not Granger Cause LGDPC	85	0.8280	0.4406
LGDPC does not Granger Cause LSPENDT		10.4710	9.E-05*
LINTTT does not Granger Cause LGDPC	85	0.8497	0.4313
LGDPC does not Granger Cause LINTTT		1.9399	0.1504
LJOBST does not Granger Cause LGVAT	110	0.2084	0.8122
LGVAT does not Granger Cause LJOBST		14.7989	2.E-06*
LSPENDT does not Granger Cause LGVAT	85	7.2153	0.0013*
LGVAT does not Granger Cause LSPENDT		11.0183	6.E-05*
LINTTT does not Granger Cause LGVAT	85	7.3938	0.0011*
LGVAT does not Granger Cause LINTTT		5.4569	0.0060*
LSPENDT does not Granger Cause LJOBST	85	4.6972	0.0118*
LJOBST does not Granger Cause LSPENDT		6.7106	0.0020*
LINTTT does not Granger Cause LJOBST	85	14.4359	4.E-06*
LJOBST does not Granger Cause LINTTT		7.1791	0.0014*
LINTTT does not Granger Cause LSPENDT	85	11.1663	5.E-05*
LSPENDT does not Granger Cause LINTTT		10.7987	7.E-05*

**Rejection of null hypothesis at 5% significance level.*

Table 6.
Granger causality tests.

for interesting results. Changes or increasing GVA in the tourism sector cause changes in tourism jobs and not vice versa, so new value-adding products and services, in this case, cause more jobs in the sector. Also, bi-directional causality relationships exist between spending in the tourism sector and GVA in tourism; between international tourism trips and GVA in tourism; spending and jobs in the tourism sector; international tourist trips and tourism; and between international tourist trips and spending in tourism. Mishra et al. [30] found similar results whereby tourism activities Granger-cause changes in regional economic growth.

Lastly, the econometric model is tested in terms of stability using residual diagnostics. In addition to the various aforementioned statistical procedures, diagnostic statistics were used to determine whether the residuals were distributed normally. Three residual diagnostic tests were performed, namely the Jarque-Bera normality test, the serial correlation test, and a heteroscedasticity test. To achieve this, the histogram of the residuals device was used. The histogram of residuals and the Jarque-Bera statistic shows that the data are normally distributed, and the results gained are valid. In terms of the serial correlation, both tests had AC values above 0.5, suggesting no autocorrelation between the variables. The results further suggested that there was no conditional heteroscedasticity among the variable.

5. Conclusion and recommendations

This study’s primary objective was to assess and evaluate the impact of the tourism sector on the regional economy of the Gauteng Province in South Africa. Research on

the impact of tourism on regional economies is relatively limited if compared to other economic sectors. One of the reasons for this situation is that data on the tourism sector is limited as it is not counted as a formal economic sector. Only sections of the industry are counted in detail, such as the hospitality industry. The tourism sector cuts across many formal economic sectors making the quantification thereof difficult. Data on a provincial or regional level are even more limited than on a national level. The objectives of this study were achieved via both descriptive and econometric data analysis.

The study's main results indicate that the tourism sector has a significant positive impact on economic growth in the Gauteng provincial region. This study's outcome is important as it reduces the uncertainty surrounding tourism and its impact on regional economies. Results indicate that tourism could contribute significantly to economic growth per capita in the study region. A 1% increase in the tourism sector's gross value-added activities could lead to between a 0.86 to 0.89 percent increase in GDP per capita. This indicates that tourism does have the potential to decrease unemployment and further contribute to alleviating poverty and improving living standards for people in local regions.

For tourism to make even greater contributions to regional economies, close cooperation is required between key regional role players such as the business community via business chambers, provincial and local government, and local communities. An effective regional tourism organisation that has as its goals as sustainable tourism development is important. It could help promote the region, initiate new regional projects, share information, and improve coordination among industry leaders. Also, cooperation between the public and private sectors could ensure natural environment protection, leading to a more attractive and marketable region.

As with most research studies, this paper also had a few limitations. The findings of this study are based upon the results in the Gauteng region, which consists of a range of municipal regions. These sub-regions differ in terms of the level of development but forms a coherent entity. This region is a leading economic region in South Africa but not in tourism as it is located in-land. Results from this region may differ from results of coastal regions such as the Western Cape or Kwa-Zulu Natal regions. Data sets per municipal area were also only available only from 2000 up to 2019 but provided sufficient data for the analysis. However, the listed limitations allow for future research studies such as the comparison of in-land and coastal regions or regions with established tourism sectors versus regions where tourism has not been developed.

This study indicates that the tourism sector could even play a critical economic developmental role in regions that are not primarily focused on the tourism sector. For tourism to be a regional economic driver, a relatively clean environment is a requirement, as well as a diversified tourist product offering or tourism sector complexity. This relates to sustainable traditional economic sectors such as the mining and manufacturing sectors in collaboration with the tourism sector. South Africa and its regions and provinces have unlimited potential within the tourism sector due to its history, cultural diversity, rich biodiversity, and natural beauty. The tourism sector should be the main industry to revitalise the ailing economy.

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