



JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

An International Scholarly Open Access, Peer-reviewed, Refereed Journal

A MULTIPLE REGRESSION MODEL TO INVESTIGATE THE CONTRIBUTION OF THE TOURISM INDUSTRY TO THE FORECASTING OF THE ECONOMY OF THE TIRUNELVELI DISTRICT

K.Sankaranarayanan *, Dr.A.Seetharaman **, Dr. A. Michael Raj *, Dr. D. Antony Singh Dhas ****, Dr.Sivapandi .A *****, Prof.A.Velaganni Joseph *******

*Ph.D Research Scholar Department of Economics, TheM.D.T.HinduCollege,Tirunelveli-627010.

**Associate Professor and Head, TheM.D.T.HinduCollege,Tirunelveli-627010.

*** Assistant Professor of Commerce, Arul Anandar College, Karumathur, Madurai.

**** Assistant Professor of Economics, Arul Anandar College, Karumathur, Madurai.

*****Assistant Professor, Department of Management Studies, Sourashtra College, Madurai-14.

*****Professor and Head, Department of Youth Welfare Studies, Madurai Kamaraj University.

Abstract

One of the most essential components of the international economy is the travel and tourism sector. It plays a role in the expansion of national economies, the creation of new employment opportunities, and the promotion of a favorable public image. This business is also accountable for a sizeable portion of the cash that goes into the overall production of GDP in countries. In order to gain an understanding of the efficiency with which a specific industry is operating, it is necessary to have access to statistical data regarding that industry's current state and to make use of up-to-date methods of data analysis. This will allow one to recognize patterns in the evolution of the industry, as well as determine dependencies and the values that are expected to be displayed by various indicators. The use of multiple regression modeling is one of these approaches.

This study explores how much of a contribution the Tourism Industry makes to forecasting the economy of the Tirunelveli District in the state of Tamilnadu. During the period of analysis 2010-2022, this study examines the link among the factors of the hotel sector's gross domestic product and the associated predictor variables: hotel night stays, hotel arrivals, and hotel industry investments. Using the method of multiple regression, I was able to determine that investments and the number of tourists visiting are both significant predictors of the variable representing GDP. On the basis of these findings, I was able to identify parts of the marketing strategy that, in my view, merit expenditure and have a strong chance of making a positive impact on the expansion of the clientele of businesses offering tourist welcoming services.

Keywords: tourism, GDP, economy, forecasting, multiple regression

Introduction

Because tourism is such a complicated industry, a wide variety of companies, organizations, and government agencies must collaborate at multiple levels in order to provide tourists with the full range of possible tourist activities and

services. From the customer's first exposure to destination marketing all the way down to their experience at the local level, every link in the chain makes a contribution to the overall quality of their vacation. The term "tourism" refers to the sum of all the businesses, organizations, and endeavors that contribute to the creation of memorable trips. The provision of transport, accommodation, eating and drinking places, retail shops, businesses, entertainment facilities, and other hotel services for individuals and groups when they are away from their usual environment. People who "travel to and remain in areas outside their typical surroundings for not more than one consecutive year for leisure, business, or other objectives,"

according to the definition provided by the World Tourism Organization (UNWTO), are considered to be tourists. The tourist industry has been highly instrumental in turning the world into a globalised economy in which all countries are able to engage in free trade and cultural exchanges with one another and share their interests in obtaining mutual benefits from the tourism sector.

When examining tourism, it is essential to take the concept of hospitality into consideration. Hospitality is sometimes described as "the business of helping visitors to feel welcome and comfortable and to am use themselves," according to one definition. Simply described, the hospitality sector is comprised of two sub-industries: those that deal with lodging and those that deal with food and drink. Together, these two sub-industries make up the major part of the industry. Hospitality, accommodation, quality of food, behavior of hotel staff, and ambience, among other aspects of hotels, play a very important role in the enhancement of tourism activity in a particular location.

Tirunelveli District

The level of contentment felt by locals in relation to the impact that tourism has had on their way of life and the activities that take place within their region is a primary consideration in the process of developing tourism. This research was carried out with the help of local residents in well-known tourist destinations in the Tirunelveli District of Tamil Nadu in India. Tirunelveli is one of the southern districts of the Indian state of Tamilnadu. The Kanthimathi Nellaippar Temple, the Agasthiyar Falls, the Manimuthar waterfalls, the Banatheertham falls, the Manimuthar and Pabanasam Dam, and the Kalakkadu- Mudanthurai Sanctuary are some of the most well-known tourist attractions in this district. This area is located approximately 600 kilometres distant from Chennai and is easily accessible by both rail and road. During the year 2017, there were a total of 66,53,644 tourists that visited the various tourist destinations located with in this area. This number includes both domestic tourists and those from other countries.

Objective

In order to determine the rate of expansion of Tirunelveli's tourism industry as well as the district's overall economy, it is necessary to conduct an investigation into the typical number of guests staying in the district's hotels.

Methodology

Primary data were utilized in the course of the inquiry that was carried out. The questionnaire was used extensively as a component of the data collection process. The researcher was unable to conduct an investigation into the viewpoints of the total population of domestic and international tourists that visited the hotels in the Tirunelveli District. To explore how much of a contribution the tourism industry makes to the forecasting of the economy in the Tirunelveli District, a multiple regression model is utilized. The contribution of the hotel business to the gross domestic product (GDP) of the nation may be contingent on factors such as investments made in hotels and restaurants, the number of overnight stays in hotels, and the number of tourists who visit the country. The primary objective of this study is to as certain the degree to which GDP is influenced by each of the three independent variables and to identify the steps that ought to be done in response to the findings, which will be achieved through the application of the SPSS programme.

Review of literature

The vast majority of economic experts working in the modern era are of the opinion that tourism is responsible for a sizeable portion of the growth seen by the nation's economy. One such piece of writing is that of Krynova (2018), in which the author says that tourism not just to fulfills human wants but also serves as a source of income on both the small and the large levels. This is an illustration of one of the fundamental concepts that may be found in their work.

The tourism industry contributes to the creation of jobs, the quickening of the construction of

infrastructure, the stimulation of output in a variety of disciplines, and the maintenance of the nation's cultural traditions. According to findings published in 2015 by an American researcher named Thano, tourism possesses a significant amount of untapped potential and is essential to the success of the nation in meeting its primary macro economic objectives, which include expanding the economy, increasing employment, and ensuring the continued growth of the economy and society. Than points out that the tourism industry might be an effective replacement for reserve currency recovery.

Additionally, for the sake of example, Abubakirov and Keleshbaev (2016) argue that the tourist industry maintains to be in the lime light, especially due to global financial advantages it brings to the state. This is because the tourism business contributes significantly to the state's economy. The researchers were able to establish, via the examination of statistical data, that the percentage of total fixed capital that is dedicated to tourism, the quantity of international investment, the ratio of expenditure on tourism to import expenses, and the participation of tourism revenue to GDP are all on the rise.

Additionally, Sokhanwar (2019) contends that the influence of tourism on the nation's macroeconomic indices is complex and contradictory. Sokhan war looks into the immediate and secondary effects that spending has on the growth of the economies of seven countries that are members of the European Union(EU). These countries all get a significant amount of their GDP from the money made in the tourism industry. In order to do this, statistical approaches that are used for discovering associations are utilised, which is something that is quite important from the perspective of the research that we are conducting. Dincer (2015) offers a comparable analysis, this time using data on Turkey to dissect the effect that tourism has had on the country's economic development and the role that the growth of the tourism industry has had in that development. He does this by comparing the performance of the economy of Turkey before and after the tourism industry experienced significant growth. The research conducted by Dincer is also quite comparable to the research carried out by Dincer (2015).

According to Yazdi (2017), the tourism industry is one of the world's most valuable and a significant contributor to international reserves, both of which are essential for the financing of economic expansion. According to the findings of the investigation that Yazdi conducted, there is a constructive connection between the money spent on tourism and the expansion of the economy both over the short and the long term.

Analysis and Interpretation

Table 1: The development of the most important economic indicators pertaining to the tourism industry from 2010 to 2022:

Years	GDP generated by the hotel industry (in millions)	Investment in hotels (in millions)	Tourists arrival in the hotels (thousands of tourists)	Night stay in hotels (thousands of tourists)
2010	8569.5	1489	7170	25121
2011	12024.2	1141.7	6691	22818
2012	9395.7	687.3	5927	19711
2013	7758.8	611.4	5851	19433
2014	6172.9	596.3	5219	17720
2015	5591.7	416.7	5020	17747
2016	5837.2	654.8	4975	18342
2017	4686.9	657	5047	17327
2018	4696.1	794.4	5127	17945
2019	4990.4	1099.9	5789	18611
2020	5972.2	1101.6	5995	18543
2021	7160.5	1332	6316	19092
2022	8502.4	1690.9	7072	21593

(Source-Primary data)

Using SPSS programmes for multiple regressions, I have reached the following conclusions:

Table 2 : Regression Co-efficients:

	Coefficients	Standard Error	t Stat	P-value	Lower95%	Upper95%	Lower 95.0%	Upper 95.0%
Intercept	-14726.3	3899.124	-3.77683	0.00437	-23546.8	5905.91	-23546.8	5905.91
X Variable 1	-5.52412	1.926107	-2.86802	0.018536	-9.88127	1.16696	-9.88127	1.16696
X Variable 2	4.086139	1.516573	2.694324	0.024622	0.655412	7.516867	0.655412	7.516867
X Variable 3	0.154481	0.336252	0.45942	0.656828	-0.60617	0.915136	-0.60617	0.915136

In this case, the dependent variable is the total GDP that was generated by the hotel industry (millions) The following is the regression equation that we get based on the non standard co-efficient:

$$Y = -14726.3 - 5.52412 X_1 + 4.086139 X_2 + 0.154481 X_3$$

Where, X₁ Variable represents the Investment in hotels (in millions)

X₂ Variable represents Tourists arrival in the hotels (thousands of tourists) X₃

Variable represents Night stay in hotels (thousands of tourists)

Table 3 : Estimation of Standard Deviation

Regression Statistics	
Multiple R	0.888202
R Square	0.788903
Adjusted R Square	0.718537
Standard Error	1146.762
Observations	13

The independent variable accounts for 78% of the total variance, as measured by the coefficient of determination R^2 (Table 3), This suggests that the regression model accounts for 78% of the total variation in the data, where as 22% of the variance is due to un identified factors, which represents the error.

Table 4 : ANOVA Model Analysis:

ANOVA	df	SS	MS	F	Significance F
Regression	3	44231334	14743778	11.21145	0.002146
Residual	9	11835577	1315064		
Total	12	56066910			

A global test is required in order to determine whether or not a multiple regression model is valid. To put it another way, this test determines whether or not the variance that is explained is not the result of a random event by determining whether or not all of the predictor factors have regression coefficients that are equal with 0. The regression coefficients of the sample are equivalent to the regression coefficients of the population that is denoted as $\alpha_1, \alpha_2, \alpha_3$ etc. The alternative hypothesis and the null hypothesis are stated in the following format : $H_0 : \alpha_1 = \alpha_2 = \alpha_3 = 0$ $H_1 =$ some α coefficient are not equal to zero.

The F test, which involves a look at the variance in the ANOVA table shown previously, will be used to decide if or not the null hypothesis is correct.

The estimated F for the variance introduced by the regression is 11.21145, which can be deduced from the data in the previous table 4 with three degrees of freedom in the fraction and nine in the ratio, the critical value of F is 3.86 at a significance level of 0.05. Upon comparing the respective F values, one is compelled to accept the null hypothesis as the more plausible of the two. The assumption that some regression coefficients are not equal to zero is what this alternative hypothesis is referring to. This indicates that the multiple regression model has a considerable influence on the variables that are being looked at.

The question that has to be answered at this point is which of the regression coefficients could be zero and which could not be zero. As a result, it is required in order to carry out an accurate individual evaluation of the regression coefficients.

Discussion

The findings from SPSS provide us with the calculated t values for each of the three variables individually (Table 2). These are as follows: -2.86802 for investments in hotels, 2.694324 for visitors' arrivals in the hotels, and 0.45942 for night stays in the hotels.

In the case of a two – tailed test with 9 degrees of freedom, the estimated t values will be evaluated with the critical value of t to determine the decision rule for the null hypothesis. This is done to determine whether or not there is sufficient evidence to conclude that the null hypothesis is incorrect. The equivalent in decimal form is 2.262.

This leads to the ultimate result of:

- The value of t that was calculated (-2.86802) can be lower than what was needed (-2.262). As the significance level of 0.018 determined by the test is lower than the minimum level of 0.05, the test fails. Since α_1 is clearly not equal to 0, we must accept the alternative hypothesis and reject the null.
- When "tourists arriving at the hotels" is the dependent variable, an estimated t value of 2.694324 is more than the critical t value of 2. (2.262). the significance value of 0.024 suggested by the test is less than the required 0.05. Therefore, we accept the alternative hypothesis and reject the null that α_2 is not equal to zero.
- The computed t value of 0.45942 for the scenario including a stay in a hotel is higher than the essential t value of 0.35296 for the scenario. (-2.262). In addition, the significant level that was discovered by the test was 0.656, which is greater than the significance threshold, which was 0.05. Therefore, we conclude that α_3 is equal to zero and accept the null hypothesis.

Conclusion

According to the findings of the multiple regression analysis that was conducted, important indicators include both financial commitments made to hotels as well as the number of guests staying there for the GDP dependent variable. On the other hand, the variable "night stays in hotels" was not found to be a significant predictor for the GDP that was obtained from hotels and restaurants. In this particular scenario, the regression model will not include this variable any more.

Financial investment made to hotels as well as the number of guests staying in hotels are important predictor to investigate the economic growth of Tirunelveli District in its tourism sector.

The strongest connection between two independent variables is found to exist between financial investments made in hotels and restaurants and the number of visitors staying in those places. Unfortunately, the number of tourism workers has expanded without commensurate increases in their levels of training. The owners of tourism enterprises have not been motivated to make changes to their staff or to spend in additional learning for their existing staff members. In my opinion, the most important thing that has to be done in order to ensure that the company will continue to have an advantage in the market over the next few years is to make investments in hotels. This metric has a strong correlation with the total number of guests staying in hotels.

References

1. Abubakirov, A. et al. (2016). Place of tourism in the economy of the Republic of Kazakhstan, Issues of economy and finance of the Republic of Kazakhstan, 39,3-6.
2. Dincer, M. Z. et al. (2015). Reel effective exchange rate volatilities impact on tourism sector in Turkey : an empirical analysis of 2003 - 2014. Procedia Economics and Finance, 23,1000.
3. Krynova, T.G. (2018). The Importance of Tourism for the Economy of the Country//This collection is based on the results of the International Scientific and Practical Conference "Concept of the Knowledge Society" in Modern Science, held on June 3, 2018 in Kazan,105.
4. Sokhanvar, A. (2019). Does foreign direct investment accelerate tourism and economic growth within Europe? Tourism Management Perspectives, 29, 86-96.
5. Thano, R. (2015). The impact of tourism on the balance of payments. American Journal of Economics, Finance and Management, 1, 529-536.
6. Khoshnevis Yazdi, S., Homa Salehi, K. & Soheilzad, M. (2017). The relationship between tourism, foreign direct investment and economic growth : evidence from Iran. Current Issues in Tourism, 20(1), 15-26.

