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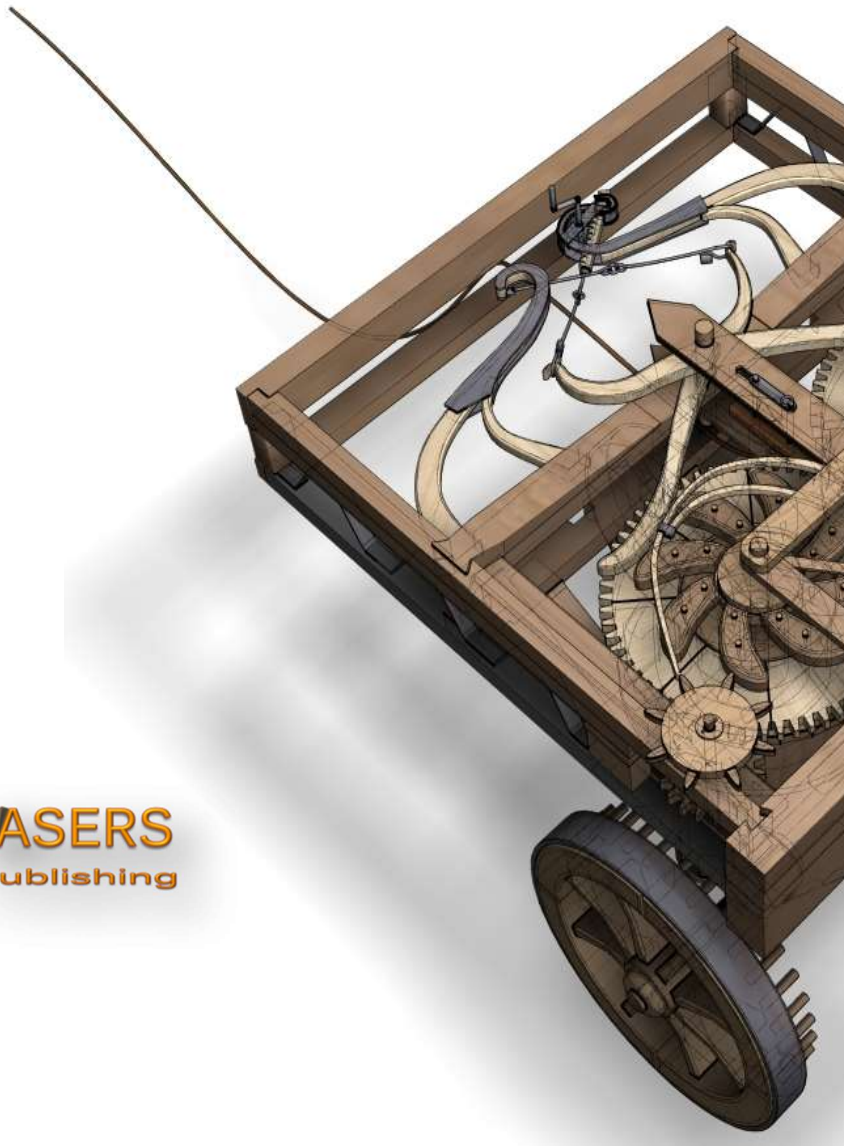

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Journal of Environmental Management and Tourism

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Mathematical Modeling of Tourism Development. An Application to Albanian Tourism

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Abstract:

The article contains a comprehensive study of tourist arrivals in Albania in the years 1994 to 2020. During this period, the trend of tourism development has been studied, using the widely approved concept of Tourist Area Cycle Theory (TALC). During these years, the number of tourists has been growing rapidly, and, the touristic sites of Albania have been transformed to serve touristic purposes, especially the coastline. Recently the geographic touristic map has been enlarged to the mountain and rural areas, touristic villages, and cultural, archaeological, historical tourism. The dynamics of tourism development have been studied by many researchers, academics, and institutions to provide a complete and clear picture of the history and predict the future of the tourism industry. Econometric, mathematical or mixed models are applied to fit the tourism development and they have been helpful and have served the purpose. The model we have used to analyze the arrivals in Albania is the Logistical and the Gompertz model, largely used to estimate growth under limited resources. The tourist arrivals, i.e., the number of tourists entering the destination country have been considered as the most important variable to describe the tourism development. Several useful software is mostly used to fit the historical data and predict future arrivals such as Stata, Lab fit, Curve Expert, Spss, etc. In our case the Stata software to run the data provided for this article. The data for this article are provided from INSTAT (National Institute of Statistics), (http://www.instat.gov.al/) and other National Institutions such as the Ministry of Tourism and Environment of Albania, (https://turizmi.gov.al/), and several International Institutional such as the World Bank, (https://data.worldbank.org/indicator/ST.INT.ARVL?locations=AL), World Tourism Organization, (https://www.unwto.org/statistic/basic-tourism-statistics). The data, together with the growing numbers of tourists show the significant impact of tourism on the economic development of the country, income, contribution to the Gross Domestic Product (GDP), employment, etc.

Keywords: tourism; mathematical model; logistic; growth; arrivals.

JEL Classification: C44, O44, Z32.

Introduction

Starting from the year 90', there has been a dynamic development of the tourism industry in the former socialist countries of Eastern and Southeastern Europe such as Romania, Bulgaria, Hungary, Albania, etc.

The development of tourism in post-socialist countries was the result of the opening of their societies and economies, the free movement of people in Western Europe, as well as the entry of European and other tourists in these countries, which led to a rapid increase in income from the tourism economy. However, all this was made possible and by the enthusiasm and great desire of the people to gain the lost time.

Among these countries, Albania is also a success story in terms of tourism development. Especially in the last decade, we have seen a rapidly growing number of foreign tourists which has brought significant improvements to the country's economy. It is the geographical location of Albania in Southeastern Europe, on the Adriatic and Ionian Sea, and the beautiful nature that forms the characteristics of its tourist economy. Tourism has also become more diverse over the last few years and now three main types of product are distinguished:

Coastal tourism is the main product that focuses on "beach and sun" tourism. The coastal line is about 470 km long; the main destinations are Velipoja, Shengjini, Durrës (Adriatic Sea), and Vlora, Himara, Saranda, Ksamili (Ionian Sea).

Cultural tourism is represented by the history of Albania in archeology, cultural and artistic heritage. Albania offers three World Heritage sites: Butrinti Archaeological Park, UNESCO sites in Berat and Gjirokastra, as well as several historical and cultural attractions and monuments, starting from the Illyrian era, Roman empire, Byzantines, and Ottoman empire.

Ecotourism, which has developed a lot in recent years, is represented by tourist farms, inns, old houses surrounded by virgin nature, built by the lake, sea lagoons, and very rich in flora and fauna.

The data is sufficient for all the analyses and studies; in the year 1995 the arrivals were 304,000, the revenues generated by the tourism industry were 67 million $, and the contribution to GNP was 2.9%; in 2018 the arrivals were around 5 million, the revenues were 2.3 billion dollars, and the contribution to GNP was 15.2%, in the year 2019 the arrivals were 6.4 million, the revenues were 2.5 billion dollars, while the contribution to the gross national product was 16.2%.

The considerable impact of tourism development on the economy is sufficient to encourage researchers to find the best fit model for tourism development based and to forecast the future. Predicting the future numbers of tourists, expenditures, and revenues will help the state to evaluate other important parameters, tax reforms, investments in infrastructures, programs, and projects on employment, training, etc.

1. Literature Review

Researchers and academics, private and public institutions have studied the importance of the contribution of tourism to the economy of the hosting country. There is always the need to analyze various aspects of tourism development, the benefits, the positive and negative effects of tourism demands on a country as a whole, (Song, Li, Witt, & Fei, 2010). One of the most robust and widely discussed theories on tourism is the concept of Tourist Area Cycle Theory (TALC), a conceptual framework that is proposed by Butler, (Buttler, 1980). Most of the studies have used the growth model of S-shaped curves, such as the Logistic and the Gompertz curves.

Lundtorp and Wanhill noted that the logistic growth model represents in a very satisfactory fit the first phases of the Tourism Area Life Cycle (TALC). In their data analysis, collected from the Danish Baltic Island of Bornholm, they concluded that the change in the life cycle of the Island was due to the growth in alternative markets for the island (Lundtorp & Wanhill., 2001).

Albaladejo and Martínez - García showed that the widely accepted mathematical model by Lundtorp and Wanhill could be extended by introducing a dynamic market ceiling and this extension can be mathematically formulated using an increasing multi-logistic growth model. This mathematical formulation allows for ceiling growth because of deliberate interventions and efforts by government regulations, reforms as well as business investments. If no effort was made, then the decline period was to start for the tourism industry. In the case of multiples markets, a multi-logistic model fits better the entire series of data (Albaladejo & Maria, 2015).

Shehu V., Kosova T., and Guxholli D. applied logistic and Bi-logistic growth models for long-term predictions of tourist arrivals in Albania during the period 1995-2014. They estimated that the carrying capacity was 5 million visitors and it was expected to be around the year 2025, and the saturation value of around 4 million tourist arrivals was to be expected around the year 2021 (Shehu, Kosova, & Guxholli, 2016).

Many other articles have successfully focused on evaluating aspects of tourism, which help to improve the image of the country and promote local products, wine or other local drinks, olive oil, fruits, or other local products. Some other articles have highlighted the importance of organizing international events, such as film festivals, sports events, local historic data, which will put the country at the center of international attention, improve the positive image and promote it as an attractive tourist destination.

Correia R., and Brito C. have analyzed the advantage of wine brands by positive touristic experiences associated with the wine from the perspective of the producers. Wine tourism as a segment of the tourism activity will improve the wine region's potential and image, and even may be responsible for creating a sustainable competitive advantage to strengthen tourist services, such as accommodation, catering, and the dissemination of cultural heritage and landscape (Correia & Brito, 2016).

Lequeux-Dincă A., I., and Preda M. have studied the usefulness and importance of cultural organizations in Romania in recent years and the effect of "cultural cities" to strengthen their profile as tourist destinations (Lequeux- Dinca & Preda, 2018).

Čizmić E., and Čaušević A., have studied the importance of the Sarajevo film festival in promoting the city as an attractive tourist site. They have tested several hypotheses to estimate the effect of the Sarajevo Film festival to promote the city as a more attractive destination place. They concluded that tourists who have visited Sarajevo during the Film Festival have a positive opinion and image of Sarajevo as a tourist destination and the occurrence of the Sarajevo Film Festival significantly improves the tourist offer of Sarajevo (Čizmić & Čaušević., 2017).

In her article, Sambuu A. has analyzed the importance of preserving the natural resources in the service of sustainable tourism in Tuva, Russia, a region with significant tourist potential. The region, with picturesque landscapes, is a national tradition and unique monuments of nature and history that makes it a great place to fulfill the growing needs of tourists. It needs infrastructure improvement, recreational orientation, and developed assessment of natural conditions for future successful tourism development (Sambuu, 2019).

Kovaci, Hasanaj, Krasniqi, & Tahiri, in their article, have analyzed the impact of tourism development in the economy of Kosovo, emphasizing the need for support of tour operators by strategists and tourism policymakers to improve the methods of planning and development of tourism in the country, in cooperation with local communities, and also contributing to the local authorities in finding and creating new tourist regions (Kovaci *et. al*., 2021).

2. Methodology

The most common variable to measure tourism development is the number of tourist arrivals or the tourist population and the most robust and widely discussed theory on tourism is the concept of Tourist Area Cycle Theory (TALC), proposed by Butler. This theory focuses on the evolution of the tourist population in a destination considering the available resources. According to Butler the evolution of tourist areas stages over time are Exploration, Involvement, Development, Consolidation, and Stagnation (Buttler, 1980).

During the Exploration stage, tourism is not yet recognized as an economic activity, there are only a small number of tourists traveling to destinations. Policymakers and persons in charge of the strategies related to tourism development have little knowledge of the measures and reforms that are needed. Small tourist groups are visiting the country, the information about tourist sites is not organized yet, tourists visit only popular sites and very few cultural, archeological sites, etc.

The Involvement stage is the period during which the number of tourists starts to increase mainly due to the increase of awareness of the people working in tourism services to see it as a profitable activity. Still, the infrastructure is outdated and there is still a lack of serious investment to improve and develop services and infrastructures. The government has not yet defined a serious understanding to help tourism as an important sector of the economic development of the country.

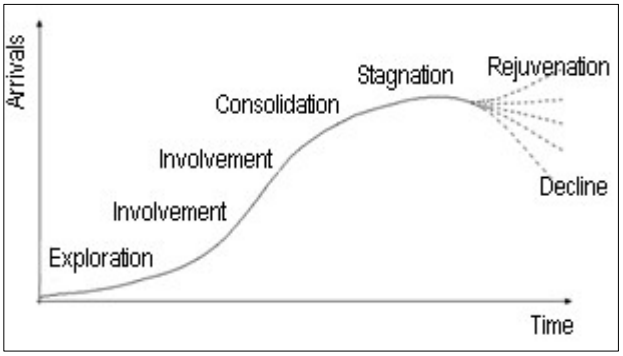
The Development stage is a very important stage for the newly emerged tourism destinations. At this stage, a significantly increased number of tourists are registered. This happens primarily due to the growing awareness of the destination as a tourist base. Small and medium businesses and people engaged in the tourist service have been for quite some time enjoying the benefits of a profitable business. It is important to emphasize the growing pressure that tourism businesses put on the local and the central government to improve the tourism policies, reforms, infrastructure, regulations, etc. During this phase, due to the cooperation of local businesses, and communities, private and public tourist destinations achieve significant improvement of service tourism quality and increase their revenues. Foreign investments are increasing and well-known international tourism companies are engaging in providing tourism destination offers and packages to their customers such as accommodation, time durations, quality, prices, etc. Cultural, historical, archaeological attractions are becoming an important part of tourist packages. Successful advertising and promotional campaigns are increasing international recognition of holiday destinations, international TV commercials, business websites, and international tourism networks. In the end, the number of tourists often exceeds the population of the destination during special events.

During the Consolidation stage, the tourist's number continues to increase, but slower. The destination sites, especially the most popular ones have been already visited many times by many tourists, and are still, making new customers. The number of new tourists is growing, but slower than the previous stage.

The Stagnation stage is reached when destination sites and tourist offer and packages have become very familiar to many customers, maybe too familiar for many of them already. New tourists maybe are coming, but

many regular tourists are looking for other destinations or already are gone. The numbers of tourists remain almost the same. At this stage, the destination places may face several other issues such as environmental problems, pollution, congested road infrastructure, and overloaded hotel capacity. Therefore, the sustainability and future of tourist destinations as well as of communities that depend on these activities deserve serious attention and study. There are two possibilities after the stagnation stage is reached, rejuvenation or decline (Butler, 2006). It is the time the government, and communities, in cooperation with the tourism businesses to take action to avoid decline and rejuvenate, figure 1.

Figure 1. Five stages of destination life circle. Source: (Butler, 2008).



2.1 The Mathematical Model of Logistic Growth

A biological population living in an environment with plenty of food, free space to grow, without threat from predators, tends to grow at a rate that is proportional to its population, that is, in each unit of time, a certain percentage of the population will produce new individuals.

The growth will be represented by the relation $\frac{dP}{dt} = r * P$

As a result, in limitless resources, the population will continue to grow exponentially. But this is not the case in real life, where all the biological populations grow in limited living environments, they are limited in food, space, and living resources. This means that population growth is influenced by many factors. At first, the growth may be exponential, but over time, the growth will decrease and become linear. In the long run, the growth will decrease and later we will have almost no increase in population.

The first to produce a mathematical model for population growth was Thomas Robert Malthus, (Malthus, 1872). In his book "Essay on Principle of Population", published in 1798 he indicated the growth rate of a population is proportional to the existing population number.

The linear model of growth of population (Malthus' Growth Model) is $\dot{P}_t = r.P_t$

The function shows that x changes from the period time t to the period time $t + 1$ with coefficient r.

If $r > 1$ then x gets bigger, whereas if $r < 1$ then x decreases.

The continuous-time model resultant is: $\frac{dP}{dt} = r.P,$ 2.1

where $P = P(t)$ indicates the population quantity at the time t.

The solution of Eq. 2.1 is $P(t) = P_0.e^{rt}$.

The Malthusian growth law is exponential over time. But, in real life, the model does not agree with reality. It was first, Adolphe Quetelet, a statistician who, in 1935 published his study "A Treatise on Man and the Development o his Faculties", (Quetelet, 2013). Quetelet concluded that populations could not grow geometrically over a long period because the obstacles mentioned by Malthus formed a kind of resistance, which he thought (by analogy with mechanics) was proportional to the square of the speed of the population growth. His work inspired his compatriot Pierre Francois Verhulst, who, in his study in 1938, "Note on the law of population growth", wrote: "We know that the famous Malthus showed the principle that the human population tends to grow in a geometric progression to double after a certain period, for example, every twenty-five years. This proposition is beyond dispute if abstraction is made of the increasing difficulty to find food. The virtual increase of the population is therefore limited by the size and the fertility of the country" (Verhulst, 1838). As a result, the population gets closer and closer to a steady-state.

Verhulst proposed the following (still somewhat arbitrary) differential equation for the population $P(t)$ at time t: $\frac{dP}{dt} = r.P(1 - \frac{P}{K})$ 2.2

When the population $P(t)$ is small compared to the parameter K, we get the approximate equation $\frac{dP}{dt} \cong rP$, whose solution is $P(t) = P(0).e^{rt}$, i.e., the exponential growth.

The growth rate decreases as $P(t)$ get closer to K, it would even be negative if $P(t)$ could exceed K.

The solution of 2.2 is $P(t) = \frac{K.Po.e^{rt}}{K+Po.(e^{rt}-1)} = \frac{K}{1+\left(\frac{K-Po}{Po}\right).e^{-r}}$ where $\lim_{t\to\infty} limP(t) = K$

The total population increases progressively from $P(0), t = 0$ to the $K = \lim_{t\to\infty} P(t)$.

The growth rate is proportional to the number of tourist arrivals at the time $t, T(t)$ and the number of other people, who may visit the destination:

$$\dot{T}(t) = a.T(t).\left(1 - \frac{T(t)}{K}\right), (T(0) > 0) \quad 2.3$$

where $T(t)$ is the number of tourists at the time $t, a > 0$ is a parameter that expresses the speed of expansion, K is the carrying capacity or maximum tourist capacity destination,

$\dot{T} = \frac{dT}{dt}$ is the derivation of tourists' number over time.

The solution of the differential equation 2.3 is $T(t) = \frac{K}{1+e^{-a(t-to)}}$, $t_0 = \frac{1}{a} ln\ (\frac{K-T(0)}{T(0)})$ 2.4

which is a sinusoidal curve with a turning point at $(t = t_0,\ T(t_0) = \frac{K}{2})$.

As the number of tourists T approaches the carrying capacity K the growth vanishes.

If we write, $T(t) = K.\beta_t$ then $\beta(t) = \frac{T(t)}{K}$. 2.5

The coefficient β_t is the percentage of tourists at the time t to the carrying capacity K. We will use it to determine the development phase of the TALC tourist destination, table 1.

Table 1. The stages of tourism development and proportion to the carrying capacity

Nr	Stage	$\beta = \frac{T(t)}{C}$	Interpretation
1	Exploration	$\beta < 5\%$	A small number of tourists. Poor infrastructures.
2	Involvement	$5\% < \beta \leq 20\%$	Residents get involved in tourism-related business. Infrastructure improvements.
3	Development	$20\% < \beta \leq 80\%$	The rapid growth of arrivals, growth of local activities, and businesses. Projects and reforms.
4	Consolidation	$80\% < \beta < 95\%$	Still growing numbers but at a slower rate.
5	Stagnation	$\beta > 95\%$	Slowing tourist numbers to stagnation.

The Gompertz model is one of the most widely used sigmoid models to fit growth data. It is the second most used after the logistic model (also called the Verhulst model). Researchers have fitted the model in almost everything related to growth, from bird growth, fish and other animal growth, plant and bacterial growth.

The Gompertz model is represented by the differential equation:

$$\dot{T}(t) = a.T(t).(lnK - lnT(t)) \quad 2.6$$

The solution of the Gompertz model (4) is given by $T(t) = K.e^{-e^{-a(t-t_0)}},\ a > 0$ 2.7

where K is the carrying capacity.

Both, the Logistic equation 2.4 and the Gompertz equation 2.7 can be identified by the calculation of the three parameters K, a, t_0.

The parameter a is the speed of expansion of the number of tourists. The parameter t_0 is the time when the number of tourists achieves the share $\frac{1}{e} \approx 36.8\%$ of the maximum level. The range of both functions is between the two asymptotes $T(t) = 0\ and\ T(t) = K$.

3. Results

The data of tourist arrivals in Albania, for the period 1994-2020, are collected from the Albanian National Institute of Statistics (INSTAT, 2021), table 2. The curve of arrivals in Albania over time and the revenues for the period 1994-2020 are shown in fig. 2, 3. The apparent decline in 2020 is due to the Covid 2019 pandemic.

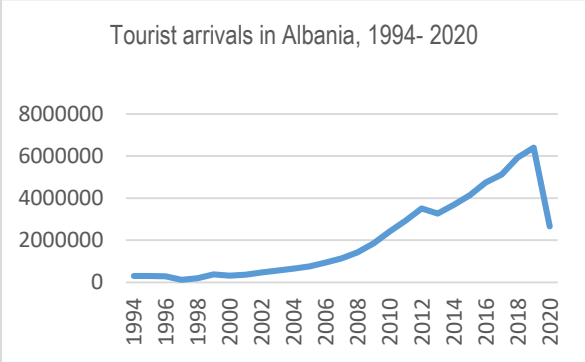
The STATA software is used to produce the parameters of the logistic and the Gompertz functions, table 3, 4. We used the data in the years 1994-2019, excluding 2020, the year of pandemic Covid 2019, the data do not represent a natural development of tourism. The input variables are the time, (years), which is represented by the independent variable var1, and the dependent variable is the arrivals (number of tourists) for each year, var 2.

Table 2. The arrivals, during the period 1994- 2020 in Albania

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002
Tourists	300000	304000	287000	119000	184000	371000	317149	354000	470574
Year	2003	2004	2005	2006	2007	2008	2009	2010	2011
Tourists	558057	645409	747837	937038	1126514	1419191	1855634	2417337	2935132
Year	2012	2013	2014	2015	2016	2017	2018	2019	2020
Tourists	3513666	3255988	3672591	4131242	4735511	5117700	5926803	6406038	2657818

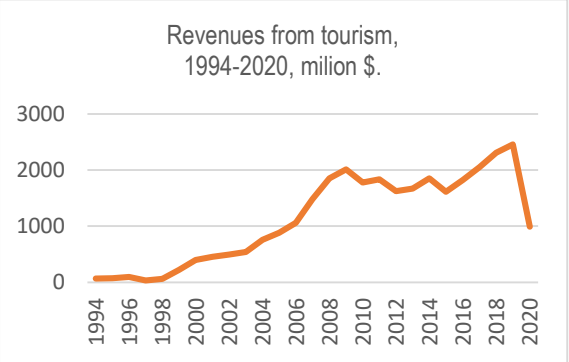
Source: National Institute of Statistics, www.instat.gov.al

Figure 2. Tourist arrivals in Albania



Source: Instant. http://www.instat.gov.al/

Figure 3. Tourism revenues of Albania, million $



Source: Bank of Albania. https://www.bankofalbania.org/

The functions are defined by using the method of Root Mean Square Error (RMSE):

$$RMSE = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(y_i - \hat{y}i_)^2}.$$

Both functions are determined by the three parameters b_1, b_2, b_3.

For the logistic function, the parameters' values are $b_1 \approx 9{,}348{,}000;\ b_2 \approx .21;\ \ b_3 \approx 2016$

And the equation of logistic growth is;

$$T(t) = \frac{b1}{1+e^{(-b2*(var1-\ \ b3))}} = \frac{9{,}347{,}921}{1+e^{-0.21(t-2016)}} \qquad (8)$$

For the Gompertz model, the parameters' values are $b_1 = 2.48.e+07;\ \ b_2 \approx .0634;\ b_3 \approx 2024.$

And, the equation of the Gompertz model is;

$$T(t) = b1 * \exp(-\exp(-b2 * var1 - b3)) = 2.48 * 10^7 * \exp\left(^{-ex\ \ (.0634(t-2024))}\right) \qquad (9)$$

The parameter $b_1 \approx 9{,}348{,}000$ of logistic function represents the carrying capacity and the parameter $b_3 = 2016$ represents the inflection point.

The functions are a good fit to the data provided, for the logistic function R- squares= .99, for the Gompertz, R- squared = .99, figure 5.

Table 3. The parameters of the logistic model

Source	SS	df	MS		
				Number of obs =	26
Model	2.016e+14	3	6.7200e+13	R-squared =	0.9954
Residual	9.315e+11	23	4.0498e+10	Adj R-squared =	0.9948
				Root MSE =	201241.8
Total	2.025e+14	26	7.7896e+12	Res. dev. =	705.6348

3-parameter logistic function, var2 = b1/(1 + exp(-b2*(var1 - b3)))

var2	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
/b1	9347921	1086625	8.60	0.000	7100065	1.16e+07
/b2	.2097803	.0162972	12.87	0.000	.1760671	.2434936
/b3	2015.652	1.183587	1703.00	0.000	2013.204	2018.101

Table 4. The parameters of the Gompertz model

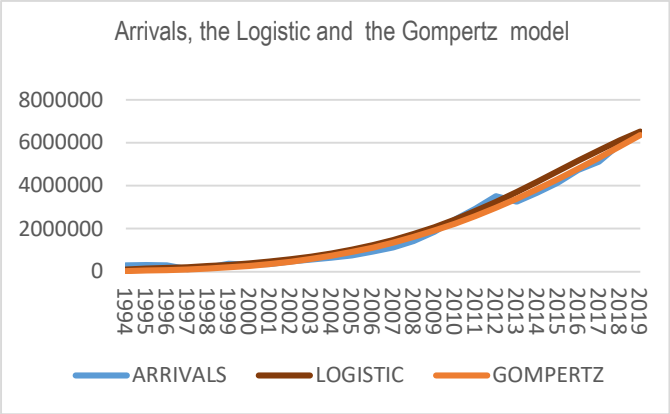
Source	SS	df	MS		
				Number of obs =	26
Model	2.016e+14	3	6.7199e+13	R-squared =	0.9954
Residual	9.332e+11	23	4.0574e+10	Adj R-squared =	0.9948
				Root MSE =	201430.4
Total	2.025e+14	26	7.7896e+12	Res. dev. =	705.6835

3-parameter Gompertz function, var2 = b1*exp(-exp(-b2*(var1 - b3)))

var2	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
/b1	2.48e+07	9584698	2.58	0.017	4942724	4.46e+07
/b2	.0633759	.0120339	5.27	0.000	.0384818	.0882699
/b3	2023.855	5.235442	386.57	0.000	2013.025	2034.685

Source: the Stata software results

Figure 5. The arrivals, the logistic, and Gompertz function



Source: Tha data, and the Stata software results

As the result of data run by the STATA software and the values of the parameter $\beta = \frac{T(t)}{C}$ we have the TALC stages, or the stages of tourism development of Albania, table 5.

Table 5. The TALC phases, the proportion values, and the interpretation

Nr	Stage Interpretation	$\beta = \frac{T(t)}{C}$	Period	K= 9,348,000 Carrying capacity
1	Exploration	$\beta < 5\%$	$1995 < t < 2002$	- 467400
2	Involvement	$5\% < \beta < 20\%$	$2002 < t < 2009$	467,400- 1,870,000
3	Development	$20\% < \beta \leq 80\%$	$2009 < t < 2024$	1,870,000- 7,478,400
4	Consolidation	$80\% < \beta < 95\%$	$2024 < t < 2030$	7,478,400- 8,880,000
5	Stagnation	$\beta > 95\%,$	$t > 2030$	9,400,000

Source: STATA software results.

Discussion and Conclusions

In this study, we have analyzed the data of tourist arrivals in Albania, from 1995 to 2019. Several studies have been conducted before for the same purpose, to analyze and model the tourism development in Albania. However, we made sure to include as much data as possible in our study, which was not an easy task.

The tourism development of destination sites is based on the conceptual model of Bulter and his product life cycle frameworks. The developed model is theoretically analyzed and the STATA software is used to run the data.

Several variables may be considered to study the tourism development of a destination country, such as tourist arrivals, spendings, overnights, etc. The number of tourists is the most common variable to measure tourism development and it is defined as the total number of foreign arrivals to the destination country.

The carrying capacity of Albania as a tourism destination is about 9.4 million tourists, and it will take years to achieve this. Albania is still in the phase of tourism development, and in this phase, there is still free space to accommodate and welcome more tourists. That means Albania will continue to see the growth of tourist arrivals for some more years to come.

The development phase will be until the year 2024- 2025 but, considering the difficult period of 2019-2021, the earthquake in Albania, and the Covid -19 pandemic, it will take some years more to get. The consolidation period will last until the year 2030- 2031, with slower growth of arrivals until the carrying capacity of 9,348,000 tourists is reached.

The period of stagnation should be considered as the time of dealing with and solving the problems that have been created during the rapid development of tourism, environmental problems, transport, and saturation of tourist destinations. This can be achieved by expanding the tourist map of the country, especially developing rural tourism, restructuring and renovating the traditional sites, and expanding the tourist services to avoid the decline in tourist arrivals, and have a rejuvenation period. New measures and reforms are needed by central and local governments in cooperation with local businesses to deal with such problems.

Albania needs to promote cultural tourism, which is a very important part of the tourism industry and a great contribution to promoting the rich historical and cultural history of our country.

Albania needs to extend the tourist season, which is currently concentrated mostly in June- October. Along with this, it is useful to expand the tourist map, including remote mountainous areas, still undeveloped, but which are very attractive in winter. This will help the development of these areas, not only tourist services such as restaurants, restaurants, hotels, but also it will help marketing the local products of agriculture, local wine, fruits, and handicrafts, etc.

At this stage of Albanian tourism development, the government should improve its strategy for tourism, with further reforms, more investments, and international promotion to attract more tourists.

We believe the Albanian government is doing that by:

- reducing the tax on tourism services, products; improving infrastructure; promoting private and public investment in the tourism sector of the country;
- building the airport of vlora, which will shorten the distance of the arrivals from abroad to the destination sites of vlora and other popular destination sites, himara, saranda;
- building the airport of kukes, which will have a great impact on the area, economy, transport, and tourism;
- expanding the tourist map of the country in the most remote areas and villages, which are famous for their beauty, attractive nature, and historical heritage;
- restauration of all the historical, religious, archeological monuments, old quartiers of berat, gjirokastra, and kruja which are the most popular old city to visit by foreigners.

Having the objective that in 2027 the total contribution of the tourism sector will be 33% of GDP and one-third of the employees will be in tourism services.

References

[1] Albaladejo, I. P., & Maria, M.-G. P. (2015). An R&D-based endogenous growth model of international tourism. *A Tourism Economics,* 21(4): 701-719.

[2] Butler, R. W. (2006). The concept of a tourist area cycle of evolution: Implications for management of resources. *In The Tourism Area Life Cycle*, 1: 3-12.

[3] Buttler, R. W. (1980). The concept of tourism area cycle of evolution: implications for management of resources". *Canadian Geographer,* 24: 5-12.

[4] Čizmić, E., & Čaušević., A. (2017). Impact of event tourism in a tourist destination quality of experience–Case of the Sarajevo Film Festival. *Universal Journal of Management,* 5(7): 332-340.

[5] Correia, R., & Brito, C. (2016). Wine tourism and regional development. *In Wine and tourism*, 27-39.

[6] Kovaci *et al.* (2021). The Impact of Tourism on the Economic Development of Kosovo. *Journal of Environmental Management and Tourism,* 12(1): 146 – 153.

[7] Kulendran, N. and Witt, S.F. (2001). Cointegration versus least squares regression. *Annals of Tourism Research, 28(2)*: 291-311.

[8] Lequeux- Dinca, A. I., & Preda, M. (2018). Festivals and cultural events–a destinFestivals and cultural events–a destination attractor and a triggering factor of change in the post-communist Romanian landscape. *Journal of Environmental and Tourism Analyses*, 5(1): 58-72.

[9] Lundtorp, S., & Wanhill., S. (2001). The resort lifecycle theory: Generating processes and estimation. *Annals of tourism research,* 28(4): 947-964.

[10] Malthus, T. R. (1872). *An Essay on the Principle of Population.*

[11] Martin, C. A., & Wit, S. F. (1989). Forecasting tourism demand: A comparison of the accuracy of several quantitative methods. *International Journal of forecasting,* 5(1): 7-19.

[12] Quetelet, L. A. (2013). *A treatise on man and the development of his faculties.* Cambridge University Press.

[13] Sambuu, A. (2019). Recreational assessment of landscapes of Tuva for the development of tourism. *Journal of Environmental Management and Tourism (JEMT),* 2 (34): 438-440.

[14] Shehu, V., Kosova, R., & Guxholli, D. (2016). Estimation of Foreign Arrivals in Albania Using Logistic Growth Model. *"Information Systems and Technology Innovations: The New Paradigm for a smarter economy"* (pp. 77-78). Tirana. Albania. ISBN: 978-9928-148-56-8.

[15] Song, H., Li, G., Witt, S. F., & Fei, B. (2010). Tourism demand modeling and forecasting: how should demand be measured? *Tourism economics,* 16(1): 63-81.

[16] Verhulst, P.-F. (1838). Notice sur la loi que la population suit dans son accroissement. *Corresp. Math. Phys.* 10: 113-126.

[17] INSTAT. (2021, 9). *www.instat.gov.al/en/Home.asp*. Retrieved from INSTAT. www.instat.gov.al/en/.

[18] worldbank.org. (2021, 9). *worldbank*. Retrieved from https://data.worldbank.org/indicator/ST.INT.ARVL?end=2019&locations=AL&start=1995&view=chart

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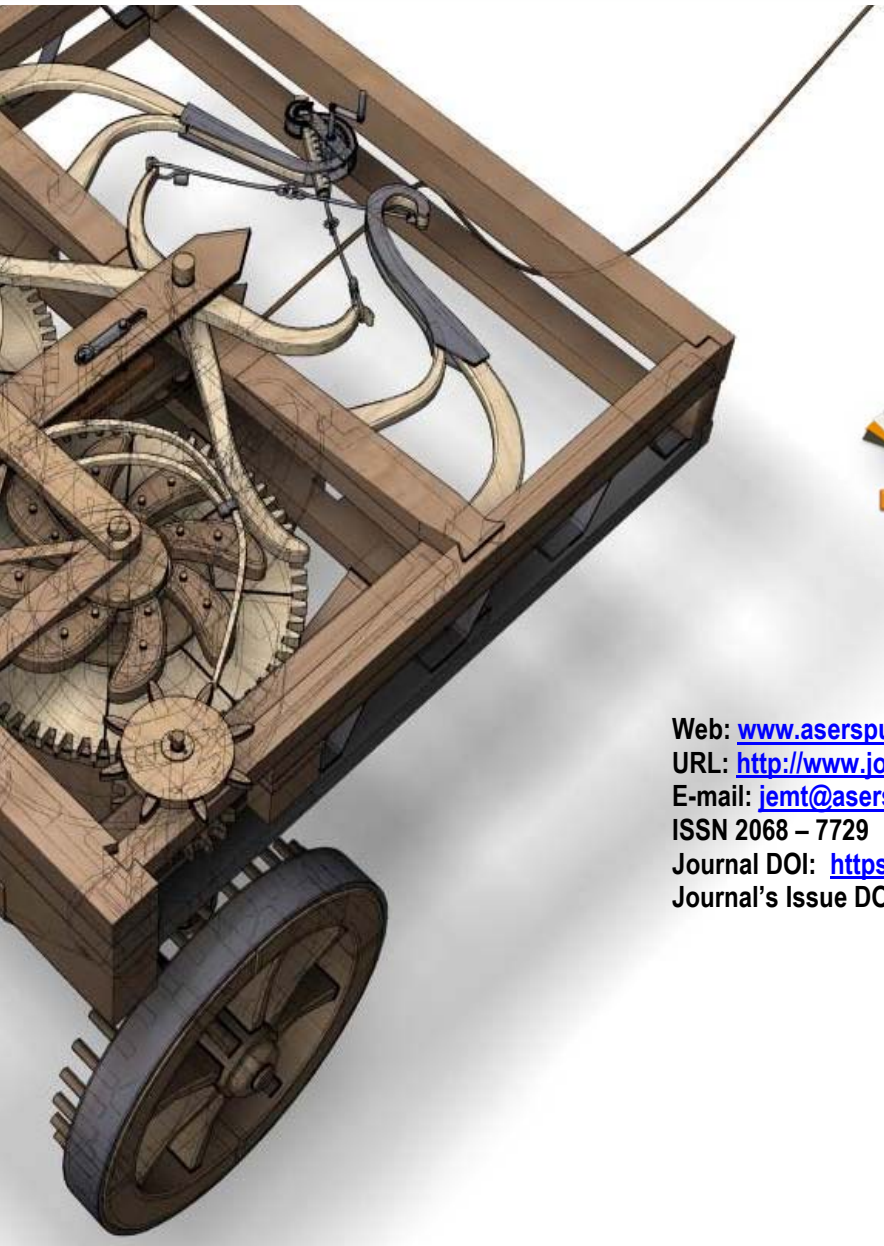

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