The Econometric Models to Some Aspects of Tourism in Nepal

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ABSTRACT

Tourism is very important sector of the world economy and of Nepal's economy too. Tourism is the largest industry in Nepal and the largest Source of foreign exchange and revenue. Possessing 8 of the 10 highest mountains in the world, Nepal is a hotspot destination for mountaineers, rock climbers and people seeking adventures. Nepal is the country where Mount Everest, the highest mountain peak in the world, is located. Mountaineering and other types of adventure tourism and ecotourism are important attractions for visitors. Tourism forecasting plays an important role in providing awareness and support for future development of the Nepal's tourism industry. International tourists from many countries such as India, China, USA, Japan, Sri Lanka, Canada, and South Korea in Nepal. This one tries to use econometric models and econometric methods to answer some questions about tourism in Nepal during 20 years. This study identifies some new research directions, which include improving the forecasting accuracy through forecast combination; integrating both qualitative and quantitative forecasting approaches, tourism cycles and seasonality analysis, events' impact assessment and risk forecasting.

Keywords: tourism demand; modeling; forecasting, International tourists, ecotourism.

1. INTRODUCTION

Nepal is landlocked country lies between two huge countries China and India. **Nepal** Surrounded by the lofty heights of the Himalayas and is a land of eternal beauty and attraction. It's a land of colorful cultures, ancient history and people, picturesque scenery and some of the best walking on earth. It is popularly known for the highest mountain peak of the world, **Mt. Everest** which stands tall at 8848 meters. Nepal tourism informs about places to visit in Nepal, famous for the birthplace of Gautam Buddha who laid the foundation of Buddhism in the country. Come and explore Nepal having rich traditions of art, culture and heritage. Kathmandu, the capital city of Nepal is a treasure house of ancient art and culture. The number of tourists had increased by 21.4 percent in 2011 and 9.8% 2012, which was Nepal Tourism Year (NTY). According to statistics from Nepal Tourism

Board (NTB), a total of 598,204 foreign tourists entered the country via aerial route in 2012. Tourism is one of the largest industries in the global economy and has been both a key driver and a beneficiary of the prolonged period of economic growth seen in recent years. It also has significant social and cultural benefits because of its potential to promote understanding and international relationships. These socioeconomic dimensions make tourism a vital component of globalization.

1.2 Literature Review

There is a vast literature examining the relation-ship between particular projects and local economic growth. These studies primarily have examined how particular infrastructure projects or policies influence local economic growth. The information, econometric model and other data collected from different websites.

1.3 Objectives of Study

The natural resources and environment are the fundamental fabric upon which the tourism of Nepal is based. Today tourism industry hosts employment to the largest number of people of the nation and relatively helps to bring large number of tourist to the nation.

- To find the societal effects (both positive and negative) caused due to the tourism.
- To find how tourism is directly involved in the country's economic condition, per capita income of the people and the employment of the destination.
- Finding the management of the environment and tourist satisfaction.
- To find the implication on sustainable tourism development, environmental impact assessment and carrying capacity.
- Compute econometric model for sustainable tourism demand and others.

1.4 Research Methodology

To cover the problems faced by the visitors as well as the local people and the tourism entrepreneur different types of research methodology were carried out. The purpose of this work is to model the international tourism demand for Nepal. The principal objective is to know the main determinants affecting tourism to Nepal. Given the importance of the sector in the regional economy, the model will be a very useful tool to forecast the possible arrivals of tourism by origin country.

1.4.1 Variables specification

For the elaboration of any model, the first decision is the selection of the dependent variable. Tourism demand can be measured using tourist arrivals to a destination, overnight stays of tourists, and tourism expenditure. Among the most important independent variables, the own price of tourism has been found to have an important role to play in determining the demand for

international tourism. Prices associated with demand are the cost related to the consumption of tourism goods and services at a given destination and the cost of international transport.

1.4.2 Nature and Sources of data

There are two sources of data .i.e. Primary and Secondary. Primary data are collected by observing the scenario and interviewing the tourism entrepreneurs, local households who are engaged to the tourism and also to those who are not. The visitors are also interviewed and the data are collected. Secondary data are collected from the relevant books, previously published data and articles, different websites, Nepal Tourism Board and others.

1.4.3 Data analysis method

The Primary and the Secondary data collected are classified under the appropriate heading and analyzed. These data are analyzed as frequency of visiting, age factor of visitors, tourism effects, pollution and many more. The outcomes of the analysis are presented by using various modes such as tabular formats, bar graphs, line graphs, pie charts, etc. The field of Econometrics is a part of Economics and deals with mathematical and statistical data. It contributes to economic models development, problem solving, and testing theories and data analysis. Econometrics is based on quantitative analysis of various economic phenomena. Statistical theory contributes to development of econometric models and methods that help to solve economic questions. Dummy variables used in economics to express qualitative or quantitative characteristics. By dummy variables we can take into account the effect of qualitative factors in econometric models. These variables take 1 or 0 values.

$$Z_t = \begin{cases} 1 \; if \; characteristic \; is \; present \\ 0 \; if \; characteristic \; is \; absent \end{cases} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Consider the simple linear econometric model:

$$Y_t = c_1 + c_2 X_t + e_t \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Dummy variable with new parameter c_3, we get,

$$Y_t = c_1 + c_2 X_t + c_3 Z_t + e_t \quad \ldots\ldots\ldots\ldots\ldots \quad (3)$$

If characteristic is present $Z_t=1$, and the intercept of the econometric model and, vice versa if, characterize it is not present and the intercept of the econometric model.

Consider the variables formed by multiplying $\geq two$ explanatory variables together which are called interaction variables. From model 2 with parameter c_3,

$Y_t = c_1+c_2X_t+c_3(X_tZ_t)+e_t$…… (4)

Where X_tZ_t is known a slope dummy variable. If characteristic is present i.e. $Z_t=1$ slope of model 4 is c_2+c_3 and characteristic absent i.e $Z_t=0$, slope is c_2. By including both intercept and the slope, we get:

$Y_t=c_1+c_2X_t+c_3Z_t+c_4(X_tZt)+e_t$ …….. (5)

In this model, if characteristic is absent, the intercept is c_1 and slope c_2. The variables: Y_t= bed-nights in Nepal (millions), X_t=time. Then,

$$Zt = \begin{cases} 1\ if\ pease\ time \\ 0\ if\ conflict-\ time \end{cases}$$

The number of tourists from 1988-2012

Year No. Tourists	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**
	265,943	239,945	254,885	292,995	334,353	293,567	326,531	363,395
1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
393,613	421,857	463,684	491,504	463,646	361,237	275,468	338,132	385,297
2005	**2006**	**2007**	**2008**	**2009**	**20010**	**2011**	**2012**	
375,398	383,926	526,705	500,277	509,956	602,867	736,215	803,092	

Therefore,

$X_t = \in \{1,2,3, \ldots \ldots,25\}$……5.1 (Exhibit-1)
The Maoist conflict against Nepal was waged from 1995 -2012. It follows.

$Z_t = 1, t \in \{1,2, \ldots.7\} \cup \{`18,19\ldots,25\}$ and $Z_t = 0$, $t \in \{8,9,10 \ldots..17\}$. Ordinary least square estimates of the relationships 2,3,4 and 5 were computed by E Views. E views regression output is presented in Exhibit 2:

	Model-2	Model-3	Model-4	Model-5
R-squared	0.42315	0.74523	0.56783	0.74562
Adj. R- squared	0.34765	0.65784	0.43567	0.73241
F-statistic	9.7243	28.3456	26.3245	16.3462
d.f	23	22	22	21

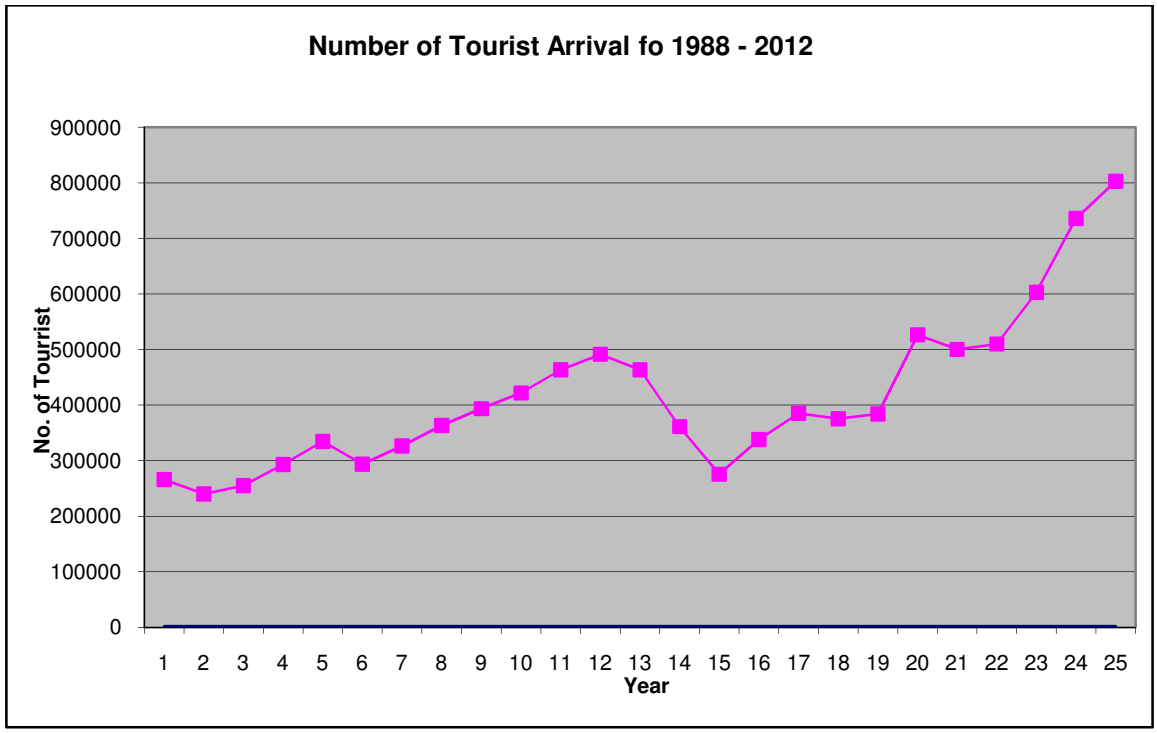
The H_0 to models 2, 3, 4, 5 are respectively. (Exhibit-2)

H_0: $c_1=c_2=0$…… ..6.1 H_0: $c_1=c_2=c_3=0$……6.2 H_0: $c_1=c_2=c_3=0$…….6.3 H_0: $c_1=c_2=c_3=c_4=0$……6.4	If they are false and we accept the alternatives H_1: at least one of the c_1 is nonzero……7.1 H_1: at least one of the c_1, c_2 is nonzero……7.2 H_1: at least one of the c_1, c_2, c_3 nonzero……7.3 H_1: at least one of the c_1, c_2, c_3 and c_4 nonzero….7.4

Towards criteria of the coefficient of determination i.e. a measure how well the explanatory variables explain the response variable, we select the model 5. But let us observe the other part of E Views regression output:

Model-5	coefficient	Std. Error	T-statistic	Probability
C1	-92541	60774.12	-0.894	0.842
C2	1347	3578.42	0.346	0.567
C3	74380	60058.34	1.244	0.321
C4	-2612.47	3228.12	-0.624	0.428

Express low absolute values of T-statistic joined to parameter estimates.



$Y_t=c_1+c_2X_t+c_3X_t^2+c_4X_t^3+ c_5Z_t+e_t$ …….. (8)

(Exhibit 4)

From calculation, R^2=0.87347, F= 39.675 with d.f 20. The H_0 and H_1 are:

H0: $c_1=c_2=c_3=c_4=c_5=0$ vs H_1: at least one of nonzero. H_2 will be accepted at 99% level. Now the next one:

Model-8	Coefficient	Std. Error	T-Statistic	Probability
C_1	-612.768	6794.42	-0.0842	0.9456
C_2	9823.456	2534.02	3.562	0.0043
C_3	915.452	228.364	-3.904	0.0004
C_4	29.235	6.345	3.4456	0.006
C_5	28763.45	4832.563	6.045	0.0000

T-statistic jointed to the intercept and H_0 for single coefficient c_1:

H_0:c_1=0 is true with high level of significance. R^2 = 0.8456 , F = 54.8654 with d.f.=21.

Model-9	Coefficient	Std. Error	T-statistic	Probability
C_1	10534.56	1986.465	5.3425	0.0003
C_2	-973.567	197.534	-4.4986	0.0002
C_3	20.4357	5.3467	3.6754	0.0016
C_4	25745.86	4164.56	6.3425	0.0006

Exhibit -6. The best econometric model estimate is:

$Y_t = 10324.6X_t\text{-}9037X_t^2 + 20.12X_t^3 + 28915.96Z_t$ (Exhibit-6) …… (9)

2. CONCLUSIONS

The purpose of the model illustrated above is to estimate the impacts of tourism on local government revenues and costs, through statistical analysis of general economic and tourism data for tourism. The model is designed to overcome the drawbacks of applying a multiplier to a single causal factor such as employment growth, because the regression analysis is based on actual fiscal changes observed tourism arrivals.

Among numerous model findings, the statistical analysis of the effects of tourism growth on municipal revenues suggested that tourism growth in this case reduced the cost of government per capita below what it would have been otherwise. These and other model findings provide a data-driven basis from which to draw conclusions regarding the net impacts of tourism growth on fiscal revenues and expenditures, and to assess competing claims regarding the impacts of casino tourism in Connecticut.

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