INTERNATIIONAL DEMAND FOR TOURISM IN NEPAL

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Abstract

A number of factors such as snowy mountains, beautiful landscape, and cultural monuments are the main attractions for visitors to Nepal. Tourism is one of the major contributors to foreign currency receipts in Nepal. Both the number of visitors and of hotel beds are increasing, however, the increase in the former is less than that of the latter. This paper is a study of demand determinants of Nepalese tourism. The tourist flow from 14 major sending countries is used in the study. The period examined is 1974-1991 and variables used include GDP per capita in constant 1985 US dollars, population of the sending countries, air distance between one of the major cities in each sending country and Kathmandu airport, airfare in US dollars from Kathmandu to each sending country's main airport, real exchange rates between sending country and Nepal, and the consumer price index in constant 1980 prices. The log linear model is selected for the study after a comparison with the linear model. The regression analysis is carried out using generalized least squares for panel data and the White covariance consistence matrix procedure for individual time series. A specific model for each individual country is examined.

The results indicate that all the variables considered are important determinants of tourism demand in Nepal. Above all income variable is highly significant variable in cases of both India and overseas arrivals. Besides, relative exchange rates between India and Nepal is greatly important variable.

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1. Introduction

Tourism is regarded as a very important industry to virtually all economies regardless of their level of economic development. It is an export industry and helps to correct any adverse trade balance in an economy. Even a highly developed economy like the United States relies partly on an increasing number of Japanese tourists to correct its trade deficit with Japan. In the developing countries with large trade deficits with the developed countries, the authorities emphasize tourism as a source of additional external revenue. In addition to generating foreign exchange, tourism is expected to create additional employment and income, and generate multiplier effects in an economy. Some countries have a comparative advantage in the development of tourism because of their natural topography such as mountains, sandy beaches and lovely landscape, their rich cultural heritage and so on. However, tourism is not unmixed blessing as it is blamed for causing environmental pollution, and many social evils such as prostitution.

The human history of traveling is very old and probably is immemorial. It is hard to say when people first started traveling to enjoy the beauties of mother nature. However, with increased urbanization and the introduction of faster modes of transport coupled with a rise in the incomes of the middle class, traveling became a part of life, especially in the west, which gave rise to tourism as one of the largest industries in the world. The important point here is that one person's enjoyment becomes the livelihood for others (English, 1986). Since tourism is an important industry, a better understanding of the factors that promote its growth is warranted. There are increasingly a large number of studies undertaken to develop the appropriate methodology for better forecasting the demand for tourism. Besides, a study on Nepalese tourism has an additional significance, since Nepal is a limited resource-based economy and people in this country do not have many choices among the means to develop their economy. Although the government has emphasized the importance of tourism since the early 1970s, Nepal is still in an infant stage in her development of tourism compared to other SAARC countries. The objective of this study are two fold: first, to develop an appropriate model of the demand for tourism; second. to examine the determinants of the flow of tourists into Nepal.

One of the limitations of the study is the lack of a good data source since the HMG/N does not have adequate data collection. Even the data collected and compiled may not be reliable. Besides, the monthly data on tourism by country are not available which put hindrances to analyze the seasonality factors in Nepalese tourism. Moreover, data on tourist expenditure in Nepal were not available at the time of this study.

This study is organized into four sections. The first section is the introduction. The second provides conceptual framework for demand for tourism. In section three, the regression results and tests of the hypotheses are reported. Finally the conclusions that have emerged from this study are presented in section four.

Definition

Smith defines a tourist as 'a voluntary, temporary traveler traveling in the expectation of pleasure from the novel experiences on a relatively long and non recurrent round trip,'(Smith, 1977). English's definition is: **A tourist is any person visiting, for at least 24 hours, a country other than that in which he or she usually resides, for any reason other than following an occupation remunerated from within the country visited.(English, 1986:3)**. In this study a tourist, owing to data limitations, is defined as a non-residential visitor to Nepal for more than one night from abroad for any reason, including business and official visits.

2. Conceptual Framework

The demand for Nepalese tourism is a part of world tourism demand. Moreover, it is a small fraction of the South Asian tourism demand. The demand for tourism, and thereby the world tourism market, have grown with the rapid growth of economies in the West. Hence, the growth in demand for tourism and the tourism market can be primarily attributed to the great success of the capitalist economy during the 1950s and 1960s. Moreover, a faster spread of air linkages and speedy jet aeroplanes contributed to increase in the demand for tourism in far distant destinations such as Nepal.

According to the standard Marshallian analysis, demand for a commodity depends primarily on the willingness to pay and ability to pay. It is a function of its own price, price of close substitutes, disposable income, tastes and so on. In Marshallian theory of consumer demand, tourist is a consumer who derives utilities from the consumption of a basket of goods. Traveling is one of the items in his/her basket. With given budget and prices, a consumer has to distribute his her income across various purchases of goods so as to maximize total utility.

Symbolically,

Max U (T, Qo)
s.t. PQo + PT= Y ..... (i)

where U = utility function, T= tourism products, Qo = other goods in the basket, P = price and Y = income or consumer's budget. By solving Lagrangian Multiplier, we can derive tourism demand function for a consumer as follows:

L = U(T, Qo) - l (PQo + PT - Y) ..... (ii)
T = f (PT, PQo, Y) ..... (iii)

Therefore, in the simplest case, demand for any particular good including traveling depends on income of consumer and relative prices. Similarly, the demand for traveling is a composite function of distance, disposable income, air fare, taste, prices of close substitutes, and so on. Willingness to travel can be explained partly in terms of the distance, since the longer the distance the higher will be the time and money costs involved. Hence, tourist arrivals to Nepal from North American countries express a higher willingness to travel than those from European countries, who in turn have a higher willingness to travel to Nepal than the Indian and other Asian tourists. The ability to pay is represented by disposable income.

It is noteworthy here that a visit or trip is one of the many commodities in the consumer's market basket. The demands for non tourism consumer goods such as food, clothing and shelter are more important to survival. A household is more likely to forego a vacation than to be deprived of these essential things. Hence during a time of economic instability, households are more likely to reduce the consumption of an expensive commodity such as tourism. Smeral writes, ' this high income elasticity is the main reason travel depends strongly on the consumption climate and on economic expectations' (Smeral, 1988:38). Smeral's allocation model (Smeral,1988 : 39) states that private consumption depends on the demand for non tourism consumer goods in country j, domestic consumption of tourism services by country j, tourism consumption abroad by country j, prices of non tourism consumer goods in country j (expressed as units of homogeneous currency), prices of foreign tourism goods and services in units of a homogeneous currency for country j, disposable income in units of a homogenous international currency in country j. He shows in that model that demand for every consumer good, including tourism, is a function of disposable income and prices. Saving is regarded as future consumption in his model. He made the assumption of a two stage decision for tourism demand. First, the volume of demand for domestic and

foreign tourism goods and services from the consumers in the countries of origin is determined. Second, the country of destination will be determined according to prices of tourism in all possible destinations.

This model may be modified as follow:

The number of tourists to a country, the expenditure of tourists and the length of stay express the demand for tourism in the tourist receiving country. The price paid for a tour or visit is the air fare to get to the destination country, plus the tourist's expenditure on food and lodging, local touring and travel, and souvenirs. The price of close substitutes is the relative price of domestic traveling and of visits to close competing countries. For instance, the tourism price in other South Asian countries may be the price of close substitutes for tourism in Nepal. However, there are many other commodities in the consumers' basket, which are assumed to be competing with each other. The close substitutes for the overseas trip may be a domestic trip. Nonetheless, unlike other commodities, tourism cannot be separated from the country where tourism is produced. For this reason, consumers themselves have to make a trip to the tourism generating country. Thus transportation cost (air fare) and time cost (distance) are part and parcel of the tourism demand.

For most people tourism can be a luxurious commodity, hence, the estimated income elasticity of demand for tourism is expected to be greater than one. The increase in per capita disposable income in tourist generating countries can have double effects on tourist generation: an increase in per capita disposable income is expected to induce the existing tourists to spend more, and an increase in per capita disposable income is expected to lead people (who were previously unable to afford the money for traveling) to travel. In the former case it will increase per capita demand for tourism and in the latter case, the number of tourists will increase. Hence the market demand for tourism will increase whenever there is an increase in per capita disposable income in tourist generating countries.

As it is mentioned before, demand for any commodity is primarily a function of its own price. The demand for tourism, as a commodity, depends on its own price. However, the appropriate concept of own price is a relative price, that is, own price relative to its close substitutes. The relative price is an important variable in tourism demand. According to the law of demand, whenever there is an increase in the relative price of a commodity, individual consumers will start demanding less of that commodity, replacing it by its close substitutes. This behavior of the individual consumers will automatically reduce the market demand for that commodity. One of the relative prices in the case of tourism demand may be defined as a ratio between the consumer price index in tourist destination

countries and tourist generating countries, because visitors can compare prices of the commodities in the host country with that of their own country. Furthermore, they can compare the prices of commodities in various alternative destination countries.

The exchange rate between two countries can be another relative price variable in tourism demand theory. Since the exchange rate is expressed here as a ratio between local currency and foreign currency, whenever the exchange rate goes up in tourist receiving countries, visitors find it cheaper to visit that country because they are able to buy more currency of the tourist receiving country with their own currency. Hence, tourists are assumed to substitute a country with a relatively higher exchange rate against a country with a lower exchange rate. The tourists can substitute international traveling with domestic traveling in the case of lower exchange rate. The depreciation of local currency may be a favorable step to increase the number of international tourists. This implies that the higher is the exchange rate the greater the flow of international tourists into the local economy. In other words, tourism demand is positively related to the exchange rate.

Travelling cost is the next relative price variable in the demand for tourism equation. For simplicity one can enter this variable in absolute terms in a tourism demand equation. It is a single relative price on which a large share of the travel budget is necessarily spent. It is a relative price in the sense that if Nepal is more expensive to travel to than its close competing countries due to a change in air fare, tourism demand in Nepal will decrease.

Distance is another relative price variable in tourism demand theory. It is an important variable in modern society since distance reflects the time costs involved in traveling. Many North Americans would prefer to make a trip to Caribbean countries and Mexico instead of India and Nepal, because of the time cost involved in it. Professor Becker's (1965) time preference theory of consumer demand explains the importance of time cost in modern society. Population size is related to the market demand for a commodity. Even if the individual demand for the commodity remains the same, whenever the population size increases, market demand for an individual commodity will increase. In other words, other things remaining the same, if population increases market demand for all commodities, including foreign trips, increases. Assuming that the people from wealthy and middle classes are a constant fraction of the total population and further assuming the number of outgoing tourists from a society as a constant fraction of the wealthy and middle class population, whenever the population increases the number of foreign trips also increases. Hence, the demand for tourism is a function of population size.

For simplicity one can exclude the prices of close substitutes for tourism demand and prices of other goods in the consumers' market basket by assuming that the demand for tourism is homogenous of degree zero and the cross elasticity between tourism demand and other consumption goods is zero. The former assumption will allow us to exclude the prices of close substitutes from the tourism demand equation while the latter permits us to ignore the prices of the other goods.

The tourism market is a monopolistic competitive market, and therefore, individuals are assumed to have imperfect knowledge about the market. Hence the demand curve for a person can be made to shift upward by informative advertising which can affect the individuals' travel motivation. The demand for traveling to Nepal by International visitors will be examined in this regard. In other words, International visitors are regarded as consumers to Nepalese tourism. The demand for tourism here is proxied by number of visitors from the rest of the world since many studies in the past overwhelmingly use this variable as dependent variable in the estimation of demand function. Like wise, per capita real GDP of visitors' countries is proxied for disposable personal income of visitors from the respective countries and real exchange rate between Nepal and India is taken as a measure of relative price in the study. (Morley, 1991). Hence, the above tourism demand (iii) can be rewritten as follows:

$$vis = f (pop, rypc, arf, dis, ne, rcpi) \quad \ldots\ldots\ldots\ldots \quad (iv)$$

where vis = tourist arrivals from India, pop = population, rypc = per capita real GDP, ne real exchange rate, and ratio of consumer price indexes. On this functional form of tourisı demand we can formulate linear and loglinear model, but the latter one is widely used to estimate the demand function in tourism and transport economics. The model to estimate above demand function is as follows:

$$\text{Model } \ln vis = \alpha + \beta \ln(pop) + \beta \ln(rypc) + \beta \ln(arf)$$

$$+\beta \ln(dis) + \beta \ln (ne) + \beta \ln(rcpi) + \varepsilon \quad \ldots\ldots\ldots\ldots \quad (v)$$

$$\Delta vis/\Delta pop > 0; \qquad \Delta vis/\Delta rypc > 0; \qquad \Delta vis/\ \Delta arf < 0$$

$$\Delta vis/\Delta dis < 0; \qquad \Delta vis/\Delta ne > 0; \qquad \Delta vis/\ \Delta rcpi < 0$$

where ln vis, ln pop, ln rypc, ln arf, ln dis, ln ne and ln rcpi are natural log of tourist arrivals, population, per capita real GDP, air fares, distance, real exchange rate, ratio of

consumer price indexes respectively. ε is stochastic error term. Tourist arrivals (vis) is assumed positively related with per capita income (rypc) and symbolically, this is expressed by the terms $\Delta vis/\Delta rypc > 0$ in the model. Unlike the price of commodity, real exchange rate between the rest of world and Nepal is assumed positively related i.e., $\Delta vis/\Delta ne > 0$. It is because higher the real exchange rate in Nepal greater is the relative strength of foreign currency and cheaper will be the price of tourism products in terms of foreign currency in Nepal and thereby International demand for Nepalese tourism will increase with a higher exchange rate and vice versa.

Introduction to the Model

Econometric modeling for tourism demand is complicated work. However, it could be a useful contribution to guide policy makers. Modeling demand for tourism varies from writer to writer. Most of them apply the ordinary least square(OLS) method. Very few use the two stage least square (2SLS) method and some use a lagged model. Most of the OLS regressions are run on a log linear model (NRB, 1988; Pye and Lin, 1983; Krause and Jud, 1973). Some authors have used an input-output analysis, others a benefit-cost model (Mitchell, 1971; Mathematic, 1970). Peter Johnson writes :

Virtually all the studies utilize a log linear model form, which has the convenient property that coefficients represent estimates of a constant elasticity value. Some investigators (Kliman, 1981; Uysal and Crompton, 1984) report trying the linear form, but obtaining inferior results to log linear form. (Peter Johnson, 1990: 147).

Likewise the independent variables used for the tourism demand model also vary from writer to writer and country to country. However, the most widely used variables are the per capita GDP, population, exchange rates and consumer price index. For this study the model selected for the study is a pooled cross-sectional and time series model. The process of combining cross-sectional and time series data is called pooling (White, 1990:133). The pooled model uses both cross-section and time series data for the study at one time. Although this model is rather complex to use, its popularity has been increasing, because the pooled model has its own advantages. One of the advantages is that the time series analysis takes into account only the possibility of changes in the tourist flow as time goes by and it does not take into account inter country comparisons, cross-section analysis provides inter country comparison only, while pooled model contains both of these features. Therefore, it is helpful to use both time series and cross-section. Data for the purpose of analysis of the tourism demand in the country. However, the pooling of the

panel data depends on the stability of the slope coefficients. If slope coefficients are not stable one cannot run the regression on pooled data. [1]

Since panel data contain the cross-section and time series data, it is assumed that both heteroskedasticity and autoregression are likely to prevail. For this reason, a time series autocorrelation model (Pindyck and Rubinfeld, 1991: 228-231) is selected which is the same as the cross-sectional heteroskedastic and time-wise auto-regressive model described by Kmenta (1971), and computer programming for this model is given in White's Shazam Manual. The models take the following forms:[2]

Linear Model

$$vis_{ti} = ao + a1\ pop_{ti} + a2\ rypc_{ti} + a3\ dis_{ti} + a4\ arf_{ti} + a5\ ne_{ti} + a6\ rcpi_{ti} + a_1 D_1 + a_2 D_2 + a_3 D_3 + e_{ti}$$

Loglinear Model

$$\ln vis_{ti} = bo + b1 \ln pop_{ti} + b2 \ln rypc_{ti} + b3 \ln dis_{ti} + b4 \ln arf_{ti} + b5 \ln ne_{ti} + b6 \ln rcpi_{ti} + a_1 D_1 + a_2 D_2 + a_3 D_3 + e_{ti}$$

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1 **As is suggested (Pindyck and Rubinfeld, 1991:224–225). If slopes were to vary as well, each separate cross-section regression world involve a district model and pooling would be in appropriate.**

2 Pindyck and Rubinfeld, suggested as follows:
If slopes were to vary as well, each separate cross-section regression would involve a distinct model and pooling would be inappropriate. See Pindyck and Rubinfeld (1991: 224-225).

Vis = Visitorss or tourists (in thousands) from a given country.
pop = population in the visitors countries (in millions)
rypc = per capita income of sending country (in billion US$), 1985 = 100
dis = air distance (in hundred km) between major airports in tourist sending country and Kathmandu airport in Nepal.
arfu = airface from Kathmandu to major airports in tourist sending countries (in dollars US deflated by consumer's price index in the United States).
rcpi = the ratio between the consumer price index in Nepal and that of tourist sending countries, 1980 = 100.
ne = real exchange rate of Nepalese currency with respect to sending countries currency. It is the nominal exchange rate in Nepal divided by consumer price index in Nepal and multiplied by consumer price index of the United States.
D1 = 1 for political disturbance and referendum 1979, 1980
= 0 otherwise
D2 = 1 for middle east crisis in 1981
= 0 otherwise
D3 = 1 for unrest in India due to assassination of Indira Gandhi in 1984.
= 0 otherwise
D4 = 1 for student strike and restoration of multi-party system in 1989 and 1990.
= 0 otherwise
D5 = 1 for Gulf war in 1990 and 1991
= 0 otherwise

The Stability of the Coefficients

Since stability of the slope coefficients is necessary for pooled regressions, test for the stability of the slope coefficients was undertaken. The test used for this is the predictive test suggested by Chow (Maddala, 1992: 174-177) which is as follows:

H_O: slope coefficie ıot change.

H_1: slope coefficients do change.

In first stage, the coefficients were estimated running a regression for the period of 1974-1989, and in the second stage, the estimated coefficients in the first stage were used for forecasting the number of visitors for the period 1990 to 1991. The test shows that the F-statistic at 1.64 (linear model) and 1.67 (loglog model) did not exceed the F0.05, 26, 201-critical value of 2.81, which means the null hypothesis that the coefficients are stable cannot be rejected at the 5% level of significance. Hence, it confirmed that we can run the pooling regression combining time series and cross sectional data. However, such pooled regression are run only for overseas countries. India is purposively excluded from such panel because the important factors infuencing tourist arrivals from India are considered to be different from those affecting overseas arrivals.

Data Sources

For this study data were collected from publications of international institutions and from government agencies in Nepal. The data on the number of visitors were collected from publications of the **Tourism Department** (HMG/N, 1990) in Nepal. Data on the distance variable were collected from **Air Distances Manual** (International Air Transport Association and International Aeradio Pic, 1988). Consumer price index data were taken from the various issues of United Nations **Monthly Bulletin of Statistics** (UNO, 1980s, 1990s) and data on population, gross domestic product and exchange rate were obtained from the **International Financial Statistics Yearbook 1992**,(IMF, 1992). Likewise data on air fares were collected from various issues of **Air line Passenger Tariff Supplement** (Scandinavian Airlines System and Swissair, 1975-1991).

3. Regression Results

The regression statistics presented in Table I were estimated from the linear model. Four of the estimated coefficients are significant at the 1% and two at the 10% level, with the correct sign for all variables.

Table I : Pooled cross-sectional Regression Results Linear Model (1974-1991):

Vis = 11.8 + 0.07 pop + 0.11 rypc - 1.59 rcpi - 0.38 arfu - 0.41 dis + 0.40 ne
(7.86)* (18.90)* (1.74)** (1.87)** (7.64)* (3.75)* (11.86)*

$\overline{R}^2$ = 0.91 RSS = 140.77 F = 118.80 N = 234

Notes : * Significant at 1% level;
** Significant at 10% level

The adjusted R^2 shows that the independent variables included in the model are able to explain 91% of the variation in tourist arrivals in Nepal. The regression results from the loglog model are given in Table II. The results show that the estimated coefficients for all independent variables are significant at the 1% level. Moreover, the model explains 98% of variation in tourist arrivals in the country.

Table II : Pooled Cross-sectional Regression Results Loglog Model 1974-1991:

vis = 3.26 + 0.65 lpop + 0.28 lrypc - 0.85 lrcpi - 1.16 larfu - 0.59 ldis + 0.17 lne
(8.65) (33.97)* (3.39)* (6.59)* (11.64)* (6.0)* (14.36)*

R^2 = 0.98 RSS = 141.64 F = 244.12 d.f.= 227 N = 234

Notes : * Significant at 1% level

Superiority of the Loglinear Model

For the comparison of models, statistics other than R^2 are also used in practice. Among various measures, Theil U, Root Mean Square Error, and Absolute Mean Error will be discussed here. These statistics examine the forecasting capability of a model. The idea behind them is that the less the forecasting error the better is a specified model. For the

calculation of these statistics, the estimated coefficients for all variables were obtained by running regressions on data from 1974-1989, then in the next phase the number of visitors were predicted for the years 1990 and 1991. Then the predicted visitors' value for these years were compared with the true number of tourists for the same years. Theil U and the other statistics mentioned above measure the inequality between the true and the predicted values.[3]

Likewise, the variance proportion expresses the degree of variability of model in the variable of interest. A high variance indicates that the actual value of the variable has fluctuated considerably hence, the lower the variance proportion the better the model. The covariance proportion measures an unsystematic error, therefore, a higher value for this is regarded as a signal of a better model. In other words, an ideal distribution of U is zero values for bias and variance and one for covariance.

The statistics given in Table III show that the calculated Thiel Us are 0.400 and 0.236 for the linear and loglog model respectively. The Thiel U, when broken into three proportions, shows that variance and covariance proportions are better for the loglog model. Likewise the Root Mean Square Error is the measure of the deviation of the simulated value from its actual path, as is the Absolute Mean Error. All statistics express the superiority of the loglog model to the linear model (see Table III). Only the bias proportion performs better in the linear model.

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3 Theil U, Root Mean Square Error and Absolute Mean Error are defined as follows (Pindyck and Rubinfeld, 1991 : 338-340.

$$u = \frac{\frac{1}{T}\sum_{t=1}^{T}(Y_t^s - Y_t^a)^2}{\sqrt{\frac{1}{T}\sum_{t=1}^{T}(Y_t^s)^2} + \sqrt{\frac{1}{T}\sum_{t=1}^{T}(Y_t^a)^2}}$$

Root Mean Square Error is defined as

$$RMSE = \sqrt{\frac{1}{T}\sum_{t=1}^{T}(Y_t^s - Y_t^a)^2}$$

Mean Average Error is defined as

$$MAE = \frac{1}{T}\sum_{t=1}^{T}\frac{|Y_t^s - Y_t^a|}{Y_t^a}$$

In the equations given above, y stands for the dependent variable, s and a for its simulation and actual values respectively. Theil inequality is denoted by U. U is just the reverse of R^2. Its value lies between 0 and 1 but unlike R^2, the lower the value of U the better is the fit of a given model. In other words, if U = 0, it is a perfect fit, and the closer the value of U to zero the better is a given model. The Theil U can be decomposed into three parts: bias, variance, and co-variance proportions. These proportions always add up to one. The bias proportion is an indication of a systematic error, hence this proportion is hoped to be close to zero for better results.

Table III: Comparison of Linear and Loglog Model:

Model	Linear	Loglog	Superiority
Theil U	0.400	0.236	loglog
Bias	0.005	0.116	linear
Variance	0.154	0.011	loglog
Covariance	0.840	0.881	loglog
RMSE	4.702	0.273	loglog
MAE	3.994	0.074	loglog

Model Specification

As it is clear from the above discussion that the double log model is the best fit for the given data, various specifications for the loglog model were tried. For each specification, the coefficient for per capita income (rypc) variable was very low, but when we tried the model dropping the variable real exchange rate (ne) that gave a relatively higher coefficient for that variable. Unfortunately it gave an incorrect sign for the distance variable and a relatively low R^2. When the distance variable is dropped from the model in another specification there was a further increase in the coefficient for per capita income; however, the adjusted R^2 was relatively low compared to the rest of other seven specifications we tried in this study. Finally, the specifications 1, in which only real consumer price index (rcpi) variable was dropped, the specification 5 in which both rcpi and distance variable were dropped, and the specification 8 in which all six independent variables such as population, real percapita GDP, real consumer price index, airfare, distance, and real exchange rate were included was selected. The basis for this selection was clearly a higher adjusted R^2. Among these three specifications, 1 and 5 gave lower and insignificant t- statistics. Only specification 8 gave both a higher adjusted R^2 and higher t-statistics for all variables including the constant. For this reason, specification 8 is regarded as the best specification. Hence, the specification 8 of the loglog model will be considered for further testing.

Table IV : Pooled Regression Results for Various Sub-periods, 1974-1989

Pds/var.		lpop	lrypc	lrcpi	larfu	ldis	lne	constant	R^2	F	N
1		0.75	0.88	- 1.19	- 0.34	- 0.82	0.14	-0.59	0.99	136.48	65
	t =	24.08	5.20	4.61	0.90	4.28	5.66	0.45			
2		0.67	0.39	- 0.67	- 0.04	- 1.04	0.16	- 0.66	0.99	141.75	91
	t =	27.34	3.86	2.02	0.28	8.42	9.39	9.39			
3		0.69	0.49	-1.69	- 0.58	- 1.11	0.20	2.55	0.99	161.98	52
	t =	30.13	4.15	7.99	3.10	8.30	11.75	4.14			
4		0.66	0.35	- 0.86	-1.08	- 0.60	0.17	2.84	0.97	195.69	208
	t =	31.81	3.81	5.81	10.14	5.60	12.39	7.04			
5		0.67	0.30	- 0.86	- 1.22	-0.51	0.17	3.15	0.98	128.94	117
	t =	24.18	2.40	5.15	12.25	3.62	10.66	6.73			

Notes: 1 = 1974-1978 ; 2 = 1979-1985 ; 3 = 1986-1989 ; 4 = 1974-1989; 5 = 1 + 3

Regressions for Sub-Periods

The regressions for the pooled model were run for various sub-periods (see Table IV). Since the number of visitors entering Nepal started to slow down in 1979, the first sub-period was selected as 1974-1978 (column 1 in Table IV). The number of visitors coming to Nepal decreased and never reached the level of 1979 until 1986, hence the regression for this slow-down period was run separately (column 2 in Table IV). The next sub-period is 1986 to 1989 (column 3 in Table IV), because the number of visitors in 1990 and 1991 declined again. Further more, the regressions for the whole period 1974 to 1989 are run (column 4 in Table IV). Deleting the tourist slow down period (1979-1985) in Nepal, and combining period 1 (1974-1978) and period 3 (1986-1989), another regression was tried, for which the results are given in column 5 in Table IV. The regression results given in Table IV seem close to the regression results presented in Table II. The reasons for this seem consistent with the down turn of capitalist economies in 1980s. In addition, since the GDP values for the tourist generating countries were converted into US $, the high fluctuation in the value of US $ during the latter half of the 1970s could be another reason.

Since the relative price level in Nepal is low and it is regarded as one of the cheaper tourist destinations in the world, the log of the relative consumer price index variable (ln rcpi) was expected to be insignificant with a relatively small coefficient. However, the results show a surprisingly significant t-statistic and the coefficients are greater than one for most years. Nonetheless, for the years 1978 and 1979, unexpected signs for this variable were found, while for the year 1980, being the base year for both cpi in Nepal and cpi in tourist generating countries, the regression with that variable could not be run. The greater than one coefficient for the ln rcpi variable and its significant t-value are consistent with the pooled regression results given in column 1 in Table IV. Likewise, they are very close to the pooled regression results presented in Table II. However, the results for this variable should be interpreted with care. One reason for this may be that the flow of so called "budget tourists" dominate tourist arrivals in Nepal, especially in earlier years. These budget tourists are likely to be sensitive to the relative price in Nepal. The growth of the Thamel area and of small restaurants and hotels for tourists in Kathmandu and Pokhara are consistent with these results. His Majesty's government of Nepal is sensitive to the growth of budget tourists, that is many tourists with low expenditures.

The next important variable is the log of airfare in US $ (ln arfu). Table II shows that the coefficient for this variable is such that one percent change in this variable brings about more than one percent change in tourist arrivals in Nepal. The coefficient is significant at the 1% level. However, airfares were collected in Nepalese currency and converted into US dollar. For the reason mentioned, there may be downward bias in this variable. In addition, air tickets bought in Kathmandu are relatively cheaper compared to the same tickets bought in Toronto or in New York. Nonetheless, almost all tourists bought round trip air tickets in their home towns. Therefore, there is again the possibility of downward bias in the coefficients of this variable.

Both the log of distance (ln dis) and the log of real exchange rate (ln ne) seem highly significant variables (Table II). However, their coefficients are low, which is logically plausible. The individual cross-sectional results are roughly close to in the case of log of distance and closer to in the case of log of the real exchange rate variable.

Time Series Regression

The time series regressions were also run for 14 countries including India. Various specifications for individual countries were tried but only the best results are presented in this study. For these time series regressions of the individual countries, GDP was measured in the visitors' own currency. The coefficients for the log of real per capita income

improved significantly, showing that visitor arrivals or the demand for tourism was highly elastic with respect to the income variable. However, multicolinearity between independent variables caused great problem in the cases of many countries. Thus, population variable was dropped except in Germany and Denmark cases. Still, the correlation between the logarithm of per capita income variable and other variables was found to be very high for several countries. To correct this problem, the logarithm of those variables was regressed on the logarithm of real per capita income variables, and in the next stage the log of visitor variable was regressed on computed residuals and on the logarithm of per capita real income variable.

a. Indian Market

In the case of India, various models are shown. Accordingly, a one percent increase in real per capita income in India brings more than a 3 percent increase in Indian arrivals in Nepal. This seems quite a reasonable result since Nepal is close neighbouring country with an open border to the east, west and south with India, not requiring a visa or foreign currency to Indian visitors travelling in Nepal. Moreover, Indian schools use to close for very hot summer and most of Indian families find relatively both pleasant weather and safer traveling in Kathmandu and other places in Nepal. For these reasons, whenever their incomes increased they select Nepal as a destination. The coefficient for ln rypc is significant at 1 percent level.

Various Models for Indian Market

a. Model I

ln vis = -1.96 + 4.53 ln rypc +1.57 ln ne
t = -2.40 6.61 2.22

Adjd. $R^2 = 0.78$

b. Model II

ln vis = 0.003 +3.14 ln rypc+0.71 ln ne - 0.59 D4
t = 0.07 62.37 3.91 - 6.76

Adjd. $R^2 = 0.99$

c. Model III

ln vis = - 0.003 + 3.14 ln rypc + 0.72 ln ne- 0.005 D1- 0.59 D3
t = 0.07 58.29 2.94 -0.05 - 6.43

Adjd. $R^2 = 0.99$

d. Model IV:

ln vis = 0.003 + 3.14 lnrypc + 0.68 ln ne + 0.01 D1+ 0.08 D2 - 0.59 D3
t = 0.07 57.25 2.66 0.13 0.76 - 6.28

Adjd. $R^2 = 0.99$

Most Indian tourists visit Nepal by chartered buses. Hence the air fare variable in US dollar (ln arf) is not considered and so in the distance variable. The tourist arrivals with respect to the change in the real exchange rate variable is elastic and significant. For Indian middle class tourists the exchange rate between Nepalese and Indian currency is most likely to be a sensitive variable.

b. Overseas Markets

For overseas countries the following equations were estimated.

Country: Australia

vis = - 6.08 + 3.14 lrypc - 0.9 lrcpi - 0.18 larfe - 0.33 d2 - 0.67d3
(6.4) (8.55) (2.62) (0.8) (2.61) (5.08)

$R^2 = 0.84$ RSS = 0.17 F = 19.95 DW = 1.65

Country: Austria

vis = - 5.99 + 1.32 lrypc - 0.24 lrcpe - 0.52 larfe - 0.14 lee - 0.16 d2 - 0.53 d3
(3.91) (4.40) (0.66) (1.61) (0.61) (0.61) (3.89)

$R^2 = 0.76$ F = 9.94 RSS = 0.15 DW = 1.98

Country: Canada

vis = - 6.48 + 2.67 lrypc - 0.18 lrcpe - 0.47 larfe - 0.07d2 - 0.18 d3 - 0.04 d4
(12.86) (15.25) (0.78) (1.69) (0.75) (2.12) (0.46)

R^2 = 0.94 RSS = 0.06 DW = 2.05

Country: Denmark

vis = - 10.57 + 15.21 lpop + 2.36 lrypc - 0.27 larf e - 0.18 d2 - 0.25 d3
(6.22) (0.95) (6.6) (0.5) (0.96) (1.46)

R^2 = 0.73 F = 10.08 DW = 1.49

Country: France

vis = 1.10 lrypc - 1.13 lrcpe - 0.98 lne - 0.02 d2 - 0.02 d4 - 0.08 d5
(3.19) (4.29) (6.22) (0.16) (0.03) (0.12)

R^2 = 0.84 F = 16.5 DW = 2.07 RSS = 0.12

Country: Germany

vis = - 30.67 + 6.13 lpop + 2.39 lrypc - 0.03 larfe - 0.28 lee - 0.21 d3 - 0.3 d4 - 0.47 d5
(1.54) (1.29) (9.49) (0.17) (1.47) (2.07) (1.68) (1.97)

R^2 = 0.88 F = 19.13 DW = 2.21

Country: Italy

vis = -26.18 + 3.04 lrypc - 0.17 lne - 0.3 d2
(7.56) (8.26) (0.85) (1.48)

R^2 = 0.80 F = 23.81 DW = 1.71 RSS = 0.54

Country: Japan

vis = - 11.84 + 1.82 lrypc -0.67 lrcpe - 1.08 lee - 0.05 d2 - 0.11 d4 - 0.9 d5
(6.19) (7.40) (1.85) (3.49) (0.29) (0.61) (0.5)

R^2 = 0.84 F = 15.58 DW = 2.43 RSS = 0.24

Country: Netherlands

vis = - 18.15+ 5.79 lrypc - 0.28 lrcpe - 0.52 larfe - 0.20 lee - 0.06 d2 - 0.05 d4
(10.35) (11.02) (0.86) (1.39) (0.66) (0.48) (0.38)

R^2 = 0.90 F = 25.83 DW = 1.86 RSS = 0.18

Country: Spain

vis = -36.35 + 5.73 lrypc - 0.07 lne - 0.34 d4 - 0.77 d5
(3.27) (3.64) (0.14) (1.31) (2.53)

R^2 = 0.44 F = 4.28 DW = 0.44 RSS = 2.93

Country: Switzerland

vis = - 9.39 + 3.05 lrypc - 0.41 larfe - 0.03 lee - 0.08 d3 - 0.04 d4
(8.60) (9.85) (1.76) (0.22) (0.85) (0.39)

R^2 = 0.87 F = 22.86 DW = 1.44 RSS= 0.11

Country: United States

vis = - 3.37 + 2.27 lrypc - 0.05 larfe - 0.25 d2 - 0.08 d3 - 0.19 d4 - 0.26 d5
(3.99) (7.47) (0.18) (2.53) (0.76) (1.71) (2.44)

R^2 = 0.78 F = 11.13 DW = 1.88 RSS = 0.09 N = 18

Country: United Kingdom

vis = - 3.65 + 3.45 lrypc - 0.05 lrcpi - 0.60 larfe - 0.09 d2
(17.17) (28.86) (0.57) (3.91) (1.59)

$R^2 = 0.98$ F =0.59 DW = 1.82 RSS = 0.003

Surprisingly, the residual of the logarithm of air fare in US dollar variable is found not to be significant in the case of the USA . This may be due to the underreporting in air fare data mentioned above. The logarithm of per capita income variable has a coefficient of 2.27 which means a 1% increase in per capita income will bring a 2.27% increase in tourist arrivals from the USA. This variable is found to be significant at the 1% level.The regression results for the UK show that demand for Nepalese tourism by UK tourists is highly elastic with respect to the logarithm of the real per capita income variable in the UK. The coefficient is 3.45, which means that a 1% increase in real per capita income in the UK will bring a 3.45% increase in UK tourists to Nepal. The t-value reveals that this variable is highly significant.Likewise, the residual of the logarithm of airfare in US dollar variable is also significant at the 1% level. However, the logarithm of relative consumer price index variable shows up with the correct sign but an insignificant t-value.

4. Summary and Conclusion

This study is an econometric study of the demand determinants of tourism in Nepal. Few such studies have been done on the demand determinants of Nepalese tourism. The study found the major determinants of the demand for tourism by estimating the demand equation. The effects of changes in macro variables such as GDP/population, population, and relative consumer price index in tourist generating countries on Nepalese tourism are well identified. In other words, our model captured the market interaction between independent variables and the tourism demand variable. Various regression results presented are evidence of this. However, our econometric model assumed that the workings of market forces and structural relationships over time are stable. These relationships are tested for stability with respect to the coefficients, which reveals that the market forces are somewhat stable over time in the case of Nepal. However, it is unlikely that over the 18 years period of time the market forces behave the same way. A model which captures the dynamics of the interaction of market forces is needed for this type of analysis. A further study in this area is required.

The demand for tourism services is widely recognised as a highly dependent on the level and growth of gross domestic product of tourist generating countries, and hence the income elasticity of tourism demand is expected to be greater than one. (See Smeral, 1988: 38). Our regression results also show that all of the 14 time series regression for individual countries have income elasticity of greater than one. However, the regression results for pooled regression gave the income elasticity of tourism demandless than one.

Present study goes through a model specification test procedure in the case of Nepalese tourism demand study. In most cases this study succeeded in specifying the model correctly. The study has specified a separate model for individual countries and tested the model specification. Since the group of tourist generating countries includes heterogeneous economies, it is essential for policy formulation for a tourism selling country like Nepal to be familiar with specific determinants of the tourism demand in individual tourist generating countries.

That India does not fit in the category of the other tourist generating countries for Nepal has been established in this study. However, a test of the model specification showed that other variables were important in the case of India, but further study would be needed to identify them precisely. This study clearly showed the down turn in the capitalist economies and its effect on the income elasticity of demand for Nepalese tourism . This study found that the distance variable is significant in Nepalese tourism demand. This implies that extra tourism promotional activities in the more distant countries are necessary. The population variable is found to be highly significant, which means that population increase in tourist generating countries is favourable to Nepalese tourism demand. However, the message that the Nepalese authorities can take from this variable is that for the further increase of tourism demand in the country, tourism promotional activities should be directed towards the countries with large population. Likewise this study shows that domestic price level and real exchange rates are important determinants of Nepalese tourism demand.

However, since this is a demand model, it is a one-sided study. For the exploration of the greater reality, both demand and supply variables are required to be included in the model, so that these variables can interact. In short, the truth is a never ending process and researchers always continue to seek for better results.

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