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A NOTE ON DEMAND FORECAST AND DETERMINANTS OF DEMAND FOR TOURISM; A CASE OF BEIJING, CHINA FOR THE PERIOD: 2011-2015.

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ABSTRACT

Estimating demand for tourism at destinations, its determinants and implications for the tourism industry have become critical in planning and policy-making for governments and destination management organisations (DMO) across the globe. Given the phenomenal growth of China as one of the leading destinations for inbound tourism in the world, this study via the case of Beijing, the capital and one of the principal tourism destinations of the country, provides a short account on the ways to forecast demand for tourism at destinations. This encompasses the understanding of the determinants of demand, estimation of demand models and the implications based on three principal inbound markets of United Kingdom, Canada and United States.

Keywords: *Tourism demand, demand forecasting, Beijing, demand models, demand elasticities.*

INTRODUCTION

China has emerged as one of the leading inbound markets rising at a very fast rate since the 1990s. China has progressively moved into the top 5 destinations in terms of tourist arrivals and now ranks third after France and USA (World Tourism Organisation [UNWTO], 2014). Inbound tourism has been considered as one of the main drivers of the country's economic progress and has been a significant part of the country's economic boom (Ayeh & Lin, 2011).

Beijing, the capital of the country has been one of the main tourism destinations for both domestic and international tourists. The 2008 Olympics has been one of prime events that led towards the success of the destination (China National Tourism Administration [CNTA], 2012). In 2010, the total number of tourists reached 80.31 million and total receipts 128.4 billion Yuan (China National Tourism Administration [CNTA], 2012). The cultural and historical attractions of Beijing like Great Wall, Forbidden City, and the summer palace have made it one of the most exciting destinations in China. The Beijing Tourism Administration (BTA) also focuses on promoting leisure, recreation, nature-based tourism, agro-tourism and industrial tourism besides cultural and heritage tourism in Beijing. On the whole, Beijing tourism over the years has grown considerably from consisting of a few small service units to one of the most important constituents of the Chinese tourism industry. Beijing tourism aims to reach a target of exceeding USD10 billion, inbound visits

exceeding more than 100 million, and domestic tourists up to 200 million by 2015. This is in line with the 12th Five - Year plan of the country to utilise tourism to enhance Beijing's economy and acting as a tool in leading towards diversifying resources and markets, internationalisation of markets (China National Tourism Administration [CNTA], 2012). Such an aim also falls in line with the national objective of making 'China the world's flagship Tourism destination by 2020" (Ayeh & Lin, 2011).

In light of the above discussion, it becomes critical to determine the forecasts of inbound tourism arrivals to Beijing in relation to the policy of the Chinese Government in terms of economic implications and growth of tourism in realising its 2020 objective. In this study, forecasting models have been developed for tourist arrivals to Beijing from three long-haul tourist generating destinations of Canada, United Kingdom (UK) and United States of America (USA). With the help of these estimated models, forecasts for tourism demand for these three tourist generating destinations for the period beginning from the third quarter of 2011 to the last quarter of 2015, have been generated.

LITERATURE REVIEW

Demand Modelling

Previous literature on analysis of demand in inbound tourism suggests that varied factors like economic factors, socio-political factors, law and order crisis, natural calamities and disease have deeply affected tourism demand of destinations from source markets (Ayeh & Lin, 2011; Song, Wong & Chon,2003). Moreover, previous studies on tourism demand analysis also reveals that two different approaches exist in analysing tourism demand, one being non-causal modelling and the other as the causal model.

The non-causal modelling involves primarily the time series models which have been used in many previous studies (Ayeh & Lin, 2011; Song & Li, 2008; Song et al., 2003). Non-causal modelling though advantageous from the point of view of data gathering and modelling, it lacks the theoretical underpinning of decision-making and thus appears ineffective for policy evaluation ((Ayeh & Lin, 2011; Song et al., 2003). On the other hand, the causal model that involves the econometric models appear suitable and effective for tourism demand forecasting primarily due to its strong theoretical basis. Econometric models are rooted in the theory of economics and thus help in determining the basis on which tourists select destinations (Ayeh & Lin, 2011; Song et al., 2003). Moreover, its ability in initiating model specification offers the opportunity to determine the course and extent of how tourists' respond to changes brought about by determining factors, through estimation of demand elasticities (Ayeh & Lin, 2011; Song et al., 2003). A number of studies conducted in the recent times have used the econometric model for demand forecasting (Ayeh & Lin, 2011; Song & Li, 2008).

Determinants of Tourism Demand and Estimation of The Model

The modelling process for tourism demand is based on the economic theory and consists of own price of a good, substitute price of a good and consumers' income as the key factors. The following equation is projected to express the tourism demand for Beijing by residents from each of the tourist generating markets:

$$Q_{it} = A\, P_{it}^{\beta 1}\, Y_{it}^{\beta 2}\, P_{st}^{\beta 3}\, e_{it},$$

In this Q_{it} is the tourism demand variable, measured by tourist arrivals from origin country $_i$ to Beijing. Here i=1,2, 3 represents Canada, UK and USA respectively at time t. P_{it} represents the relative consumer price for tourists from origin country i to Beijing at time t. P_{st} represents the price of tourism in the substitute destination at time t. Y_{it} is the income of the origin country at time t and e_{it} represents the residual term for capturing the influence of all other factors that are not included in the model. It involves all other factors, economical and non-economical, (that were not included earlier due to paucity of data) significant in influencing tourism demand.

Three seasonal dummies were included in the quarterly in relation to seasonal variations. In addition, few dummy variables were included to study the impact of certain events on the demand of tourism for Beijing. These dummy variables were the New York World Trade Center terrorist attacks in 2001 famously denoted as 9/11 which is expected to render a negative effect on tourism demand. Similarly, more events significant to the region like SARS outbreak in 2003, H1N1 flu outbreak in 2009, the on-going global financial crisis that started in 2007 and restrictive flow of tourists to Beijing for the Beijing Olympics 2008 have been included in view of their expected negative impacts on tourism demand of Beijing. The Beijing Olympics 2008 has been included in view of its expected positive impact on tourism demand for Beijing.

Table 1: **Estimates of Demand Models (2000 Q1 – 2011 Q2)**

	Canada	**UK**	**USA**
Intercept	-5.362 (-2.829)*	.806 (3.441)*	-7.236(-4.324)**
D1	-.531 (-14.961)**	-.405(-7.906)**	-.374(-7.741)**
D2	.038 (.946)	.464 (7.722)**	.435(8.003)**
D3	-.136 (-3.354)*	.029 (.560)	.055(1.146)
LAGS(LNTA,1) ln Q_{it-1}	.446(9.236)**	.771(12.031)**	.495(9.297)**
LAGS(LNTA,3)ln Q_{it-3}	.131 (2.919)*		
LAGS(LNGDP,1) ln Y_{it-1}	1.486 (3.476)*		
ln P_{st}	.976 (2.283)*		
dSars	-1.575 (-18.659)**	-.939 (-7.480)**	-1.755(-14.680)**
d08oly		268 (2.107)*	
ln Y_{it}			2.097(5.242)**
Tests of normality Kolmogrov-smirnov(KS) Shapiro-Wilk(SW)	 KS- .089 SW- .977	 KS- .095 SW - .971	 KS- .114 SW - .952
R^2	.983	.892	.951
Adjusted R^2	.979	.875	.943
DW (Durbin- Watson)	1.323	2.764	1.992

Note: ** and * represent 1 percent and 5 percent significance levels

Table 2: **Estimates of Demand Models (2000 Q1 – 2011 Q2) on Multicollinearity**

	Canada		**UK**		**USA**	
D1	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF
D2	.581	1.722	.661	1.512	.660	1.515
D3	.446	2.242	.454	2.203	.493	2.027
LAGS(LNTA,1) ln Q_{it-1}	.475	2.106	.626	1.597	.661	1.513
LAGS(LNTA,3)ln Q_{it-3}	.228	4.388	.643	1.555	.443	2.257
LAGS(LNGDP,1) ln Y_{it-1}	.278	3.602				
LNPST ln P_{st}	.198	5.047				
dSars (SARS)	.157	6.362				1.090
d08oly (08 Olympics)	.861	1.161	.935	1.069	.917	
ln Y_{it} (LNGDP)					.529	1.891

Note: Tolerance should be more than 0.2 and VIF should be less than 10

The results of the study as evident from Table 1, show that at least two out of the three seasonal variables have been highly significant. Most striking has been the lagged dependent variable of Q_{it} (Q_{Qit-1} $_{-1)}$ as well as the SARs (dSars) outbreak being highly significant in the cases of all the three tourist generating markets of Canada, UK and USA. These results are indicative of two aspects. Firstly, the tourism demand for Beijing is dependent upon the immediately previous quarter of visits for all the three markets. Secondly, the outbreak of contagious disease like SARS can have significant effect on tourists' selection of Beijing as a destination and its attractiveness to them. However, H1N1 flu (considered as one of the dummy variables) which broke out in 2009 and had an impact in Asia did not have any significant impact on Beijing's tourism demand according to the results. The Beijing Olympics 2008 only had a moderately significant impact on tourist arrivals from UK to Beijing.

Validity of the Model

As per Table 1, the test of normality with reference to Kolmogorov-Smirnov and Shapiro-Wilk tests resulted as insignificant (more than .05) for all three tourist generating markets of Canada, UK and USA indicating that the regression standardised residual is significant in terms of being normally distributed. According to the same Table 1, the adjusted R^2 and Durbin-Watson values suggest that the tourism demand models of three tourist generated countries of Canada, UK and USA have all passed the test of autocorrelation. According to Table 2, the tolerance values for the significant dependent variables of all markets is more than or around .2 and the VIF values for the significant dependent variables of all the three markets are less 10. These results are indicative that the models for tourism for all the three tourist generating markets to Beijing have passed the test of multicollinearity. Lastly, the scatterplots (provided in the appendix 1, 2 and 3) in the tourism demand models of all the three tourist generating markets reveal that heteroscedasticity exists in all of them. Therefore the models of tourism demand of all the three tourist generating markets of

Canada, UK and USA have cleared all the four statistical diagnostic tests of normality, autocorrelation, multicollinearity and heteroscedasticity.

Elasticity of Demand

Based on the models of tourism demand for the three tourist generating markets in Table 1, demand elasticities were calculated as given below in Table 3.

Table 3: Estimated Demand Elasticities

Model	Income elasticity	Own price elasticity	Cross-elasticity
Canada	3.515404	-	2.308039
UK	-	-	-
USA	4.151692079	-	-

From Table 3, it is revealed that for Canada and USA, income elasticity is an important factor as it is indicative of the fact that changes in income levels of tourists from these markets will have an impact on tourism demand by these tourists for Beijing. In other words, increase in income levels of tourists from Canada and USA initiates an increase in tourism demand for Beijing by them. Therefore tourism demand by tourists from these two countries depends on the changes in their income levels at their origin country. In terms of price elasticity for substitute destinations, only Canada is the market evident from Table 3 that is sensitive to price changes in substitute destinations. In other words, price changes in substitute destinations will have a significant impact on demand on Beijing tourism by tourists from Canada. Ayeh & Lin (2011) found similar results in their study where Canada appeared to be most highly influenced by price changes in substitute destinations that had an impact on tourism demand for China by tourists from Canada. However, none of the three tourist generating markets appear to be sensitive to price changes of tourism services and products of Beijing as evident from Table 3. For UK, the estimated model developed did not include the dependent variable based on which income elasticity, price elasticity and cross elasticity could be calculated.

Forecasts

Arrivals of tourists from the three tourist generating markets of Canada, UK and USA for the period starting from third quarter of 2011 to the last/fourth quarter of 2015 have been forecasted in Table 4, based on the estimated demand models for tourism of the three markets.

Table 4: Quarterly Forecast ('000) of Tourist Arrivals to Beijing from Three Long-Haul Tourist Generating Markets (2011Q3 – 2015Q4)

Quarters	Canada	UK	USA
2011 Q3	46.14035	50.50832	198.9541
2011 Q4	50.04118	46.08437	171.3751
2012 Q1	31.93298	28.63959	109.2646
2012 Q2	45.89117	47.32208	198.0093
2012 Q3	45.84515	45.13744	182.6069
2012 Q4	49.85917	42.25753	166.3334
2013 Q1	31.86798	26.7877	109.0244
2013 Q2	46.16688	44.94464	200.2976
2013 Q3	46.30296	43.37857	185.5838
2013 Q4	50.45645	40.98205	169.4371
2014 Q1	32.31205	26.16206	111.1861
2014 Q2	46.87472	44.13302	204.3852
2014 Q3	47.05395	42.77329	189.8218
2014 Q4	51.30774	40.5404	173.5105
2015 Q1	32.87255	25.94438	113.9255
2015 Q2	47.70322	43.84961	209.4812
2015 Q3	47.89653	42.56132	194.175
2015 Q4	52.23501	40.3854	177.318

CONCLUSION

Tourism demand modelling and forecasting is therefore a vital with relation to industry players and federal tourism decision-making bodies. The study followed the general-to-specific approach for the three tourist generating countries of Canada, UK and USA and by means of four statistical tests the best models were developed. Some of the most striking findings of this study were tourist arrivals of the previous quarter had a profound influence on the demand for tourism of Beijing from all the three markets. This implies that repeat visitation is an important aspect influencing tourism demand of Beijing and the tourism decision-makers have to emphasize on this for enhancing tourism demand and tourist arrivals. Another important factor is the income levels of the tourists at their origin countries. This can have implications for the tourism administrators at Beijing who need to study and observe the economic conditions of tourist generating markets to forecast demand effectively. Lastly, price of tourism products and services of competing destinations appeared as an important aspect for tourists from Canada. Therefore implications for Beijing tourism administrators is that pricing and promotion of tourism services and products needs to be done keeping in mind the prices of products and services in competing tourism destinations and take competitive steps to monitor it.

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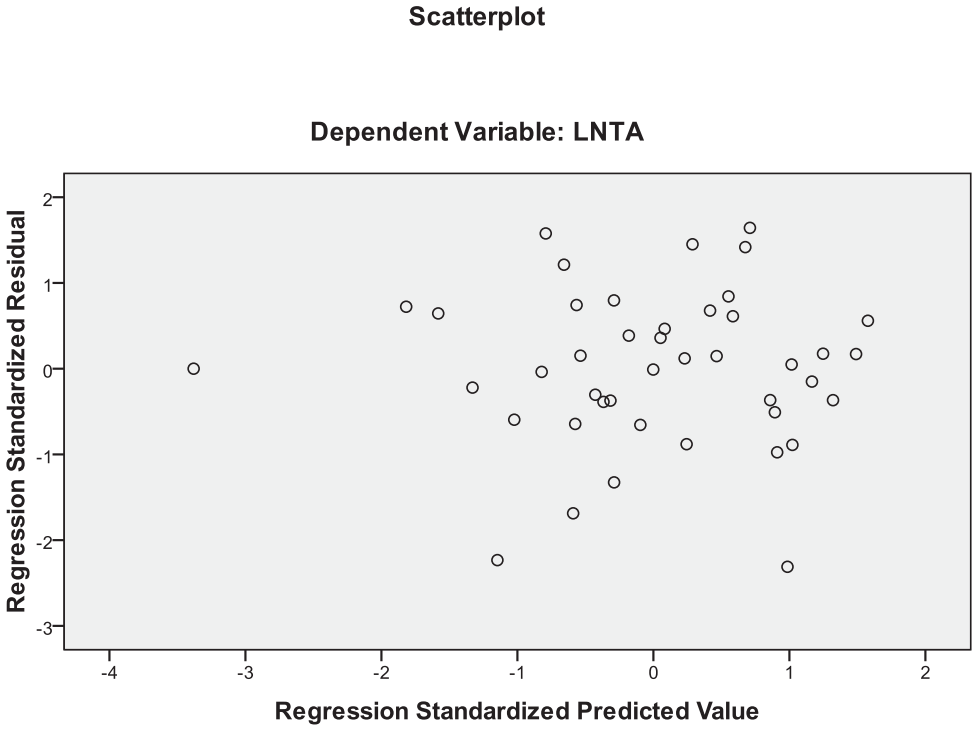
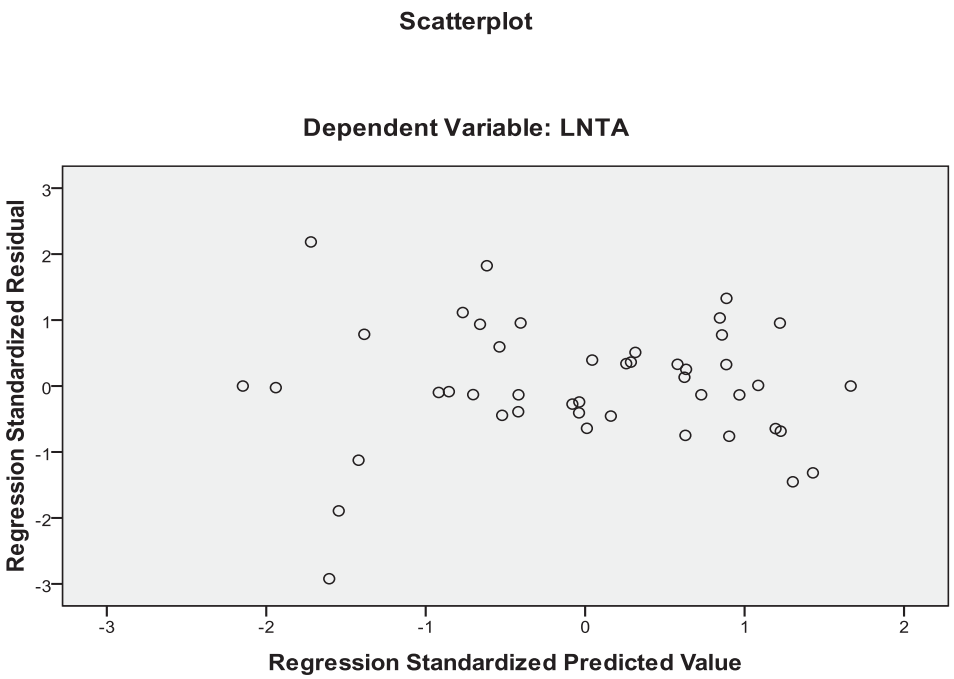
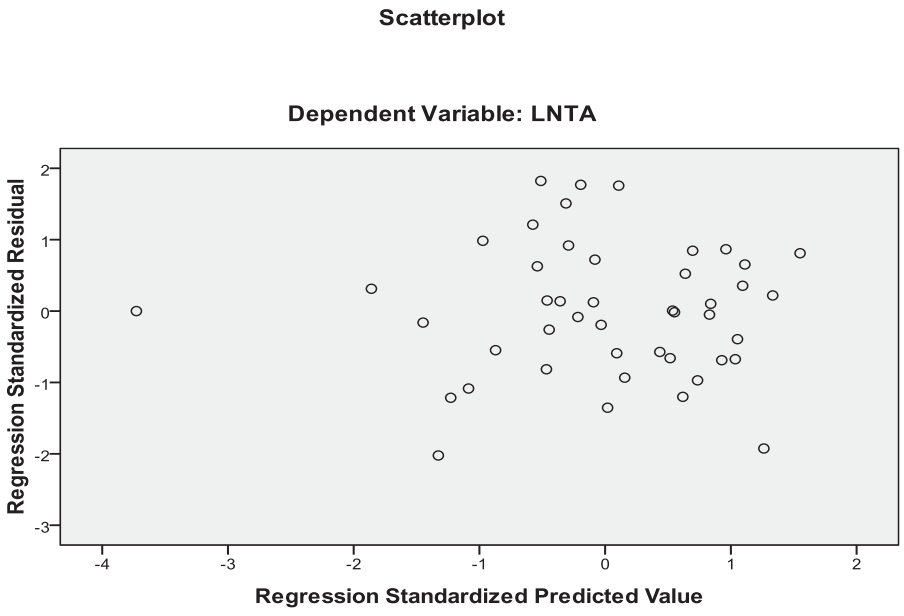
Appendix 1: Scatterplot for Canada



Appendix 2: Scatterplot for United Kingdom (UK)



Appendix 3: Scatterplot for United States of America (USA)



Note: The circle on the far left denotes an outliner that has appeared on account of the SARS outbreak in 2003 Q2