



Forecasting Tourism Demand in Barbados

by

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1. Introduction

Tourism is the most important economic activity in Barbados. For example, the contribution of tourism to Gross Domestic product (GDP) increased from 8.9% in 1971 to 16.1% in 1996. In addition, tourist receipts in 1997 accounted for 56% of all foreign exchange receipts and employed 15% of the labour force. Clearly the forecast of tourism is a leading component in the forecast of the Barbados economy.

In the current macroeconomic forecasting used by the Central Bank of Barbados (CBB), the forecast of tourism uses a two-step procedure (see Craigwell, 1997, for greater exposition). First, the demand for the tourism product is estimated and projected. The determinant is real output in the visitors' home countries plus a deterministic time trend. Secondly, the projections are adjusted in order to reflect market specifics such as, expansions in hotel capacity and upgrading, changes in airline seating capacity, marketing/promotional expenditures, and, to be consistent with previous corresponding seasons (previous quarters).

The idea of a deterministic trend in tourist arrivals is quite unappealing. Figure 1, which shows tourist arrivals to Barbados from its major markets, indicate in all cases a trend which is evolving with time. There are other factors which enter into the tourist's choice of a destination and therefore quite a bit is left unexplained in the first step. In the second step the forecaster attempts to take this into account but in a relatively ad hoc manner. The introduction of seasonality by way of adjustment factors which keep the ratios between the seasons relatively constant from year to year is not consistent with the stylized facts. A quick glance at Figure 1 indicates that the data is rich in seasonality but none of the graphs shows this pattern as constant.

Apart from the CBB model, there is only one other study on tourism forecasting for Barbados, and that is Dharmaratne (1995) who utilised ARIMA modelling. The main criticisms of his study are that it contains no explanatory or economic variables and it is difficult to interpret its individual components. For other limitations of ARIMA modelling, see Harvey (1981, pp 82).

This paper attempts to build a forecasting model based on Structural Times Series Modelling Approach, where we combine regression with time series analysis. A Structural Time Model (STM) is set up based on observed components - trends, seasonals, and cycles - all of which have direct interpretations. These components can be allowed to vary with time and explanatory variables are included wherever possible. Such a model will allow us to extract the maximum amount of information contained in the series on tourist arrivals while at the same time include any other information relevant to forecasting arrivals.

The next section reviews some studies of tourism demand in an effort to identify and justify factors relevant to a tourism forecasting model in the interest of space the studies are summarised in the appendix (table 1). Section 3 sets out the structure and data of our model. Section 4 describes the econometric methodology and procedure. In section 5 we present the result of the estimation and forecasting and conclude with some remarks in section 6.

2. Studies of Tourism Demand for the Caribbean

As evident from table 1, the macroeconomic demand function for tourism typically has three arguments: an income variable, the price of tourism relative to the prices of all other goods and the price of tourism relative to the price of competing tourist services. Foreign travel seems to be an optional consumption good with a high income elasticity of demand in most industrial countries.

In general income in the source country seems to offer a robust explanation of the variation in Caribbean tourism arrivals, with elasticities that vary from destination to destination. Evidence about the effects of relative prices is inconclusive. Rosensweig finds some evidence at a very aggregated level for the Caribbean region as a whole but the results at the national level are a mixed bag. Other factors such as the distance from major markets and airfares may have an effect but these results are not particularly robust.

3. A STM of Tourist Arrivals

The first element in the potential tourist's choice is the decision to go abroad which, for many, depends on the level or growth in incomes and the price of an overseas holiday relative to the retail price level or, more typically, the change in relative prices.

The second element is the choice of a destination which depends on the characteristics of the tourism destination and the traveller's preferences. Considerations which enter this choice include the relative prices of alternate tourism products, the climate, the convenience of getting there and the infrastructure for tourism. The choice may be affected by tourism promotion, travel writers' opinions and other news (see Morley (1992) for a theoretical approach). Due to data limitations we can only test for the effects of relative prices of competing destinations.

The STM to be tested is therefore:

$$\ln ARR_i = f \left(\ln Y_i, \ln \frac{P(\text{tour})}{P_i}, \ln \frac{P(\text{tour})}{P(\text{comp})}, \text{Trend, Seasonal, Cycle} \right) \quad (1)$$

where ARR is tourist arrivals to Barbados, Y is real GDP, P(tour) is the price index of tourism services in Barbados, P is the consumer price index, P(comp) is the price index of competitive tourist product and i is the country index (Canada, US, UK, all others).

Data

Arrivals from each source country is the measure of tourism activity. A measure of real tourism expenditure broken down for each source country is not available but it seems plausible that tourists from the same source will spend the same amount on average wherever they choose to have their vacation. The alternative would be to use aggregate expenditure (receipts) but with loss of information on individual source country demand (Carey, IMF) or to confine the analysis to the US market for which a breakdown of expenditures is available (Metzgen-Quemarez).

The income variable is the constant price GDP. The price of tourism is computed by dividing tourism receipts by the number of bed nights defined as the product of arrivals and the average length of stay. For each country the price of the competing tourism product is a weighted average of the tourism prices of the other five countries in the study. The weights are each country's share in Caribbean tourist arrivals. The consumer price indices in the source countries are chosen to represent the price of all other goods and services. The data sources are the CBB Statistical Digest and the IFS CD ROM.

4. Econometrics Methodology

By including time-varying components in the regression equation 1, we can capture movement in tourist arrivals which is not explained by the three explanatory variables included and would otherwise be left in the residuals. This would enhance the predictive powers of the model. The econometrics methodology discussed below is all set out in great detail in Harvey, 1989. The software package used in this study is STAMP 5.0.

Trend

The trend component is modelled as (Harvey, 1995)

$$\begin{array}{ll} (\text{level}) & \mu_t = \mu_{t-1} + \beta_{t-1} + \eta_t \quad \eta_t \sim \text{NID}(0, \sigma_\eta^2) \\ (\text{slope}) & \beta_t = \beta_{t-1} + \xi_t \quad \xi_t \sim \text{NID}(0, \sigma_\xi^2) \end{array} \quad (2)$$

where η_t and ξ_t are the level and slope disturbances respectively, and are mutually uncorrelated. $\text{NID}(0, \sigma^2)$ denoted normally and independently distributed with mean zero and variance σ^2 . μ_t β_t represents the level and slope of the trend respectively. From this general formation we can allow the trend to take on various forms. The simplest would be a random walk where we only allow for an underlying level which moves up and down overtime. This can be achieved by setting β_t equal to zero. We can further restrict it by setting σ_η^2 to zero. Retain β_t but setting σ_ξ^2 to zero allows for a fixed slope.

How do we decide on the form of the trend? Based on prior knowledge of tourism behaviour we expect it to be stochastic, but life is much easier with STAMP. The estimation procedure is done by casting the model in state space form and applying Kalman Filter (Harvey, chapter 3), and the extent to which the level and slope change over time is governed by the hyperparameters, $q_1^2 = \sigma_\eta^2/\sigma_\epsilon^2$ and $q_2^2 = \sigma_\xi^2/\sigma_\epsilon^2$ where σ_ϵ^2 is the variance of the residuals for equation 1 (of course the outcome must be consistent with prior knowledge). We start by specifying the general form for the trend, a value for any hyperparameter of zero would indicate that the corresponding component is deterministic and we can respecify the model with that particular component fixed, and test to see if it is significantly different from zero.

Seasonal

This is where we can expect the strength of STM to show up in the study. The data clearly exhibits seasonality and a priori information of tourism activity suggests a stochastic pattern. For example, carnival in the summer is a growing attraction for tourists, and correspondingly the summer season arrivals have been growing relative to other seasons. Also, greater marketing efforts have been channelled into attracting 'sports tourism' and 'heritage tourism' and therefore arrivals are changing with the seasons of these activities (cricket, golf tournaments, etc.).

The seasonal component, γ_t , is modelled as:

$$Y_t = Y_{t-1} + \dots + Y_{t-s+1} + \omega_t \quad \omega_t \sim \text{NID}(0, \sigma_\omega^2) \quad (3)$$

without the disturbance term, ω_t , we have the deterministic case and the seasonal components sum to zero over the previous year. This is called the 'dummy variable' form of stochastic seasonality. The 'trigonometric' form of stochastic seasonality may be written as:

$$Y_t = \sum_{j=1}^{(s/2)} Y_{j,t} \quad (4)$$

where each $\gamma_{j,t}$ is generated by

$$\begin{aligned} Y_{j,t} &= Y_{j,t-1} \cos \lambda_j + Y_{j,t-1}^* \sin \lambda_j + \omega_{jt} \\ Y_{j,t}^* &= -Y_{j,t-1} \sin \lambda_j + Y_{j,t-1} \cos \lambda_j + \omega_{jt}^* \end{aligned} \quad \text{for } j=1, \dots, [s/2] \quad (5)$$

where ω_{jt} and ω_{jt}^* are zero mean white-noise processes which are uncorrelated with each other with a common variance σ_j^2 for $j=1, \dots, [s/2]$. Again we can use the hyperparameter estimates of α_ω^2 to determine whether we should model seasonality as deterministic or stochastic.

Cycle

It has long been argued that a destination exhibits a 'life cycle' in its demand for its tourist product. Butter (1980) was the first to identify a specific S-shaped cycle which he coined 'tourism life cycle'. He cited Mexico as an example and suggested that destinations evolve through six growth stages: exploration, involvement, development, consolidation, stagnation, and decline or rejuvenation. Subsequent studies found such cycles apply to Malta (Oglethorpe, 1984), Antigua, Aruba, St. Lucia and the United States Virgin Island (Wilkinson, 1987).

The cycle component, ψ_t , is modelled as:

$$\begin{pmatrix} \psi_t \\ \psi_t^* \end{pmatrix} = \rho \begin{pmatrix} \cos \lambda_c & \sin \lambda_c \\ -\sin \lambda_c & \cos \lambda_c \end{pmatrix} \begin{pmatrix} \psi_{t-1} \\ \psi_{t-1}^* \end{pmatrix} + \begin{pmatrix} \kappa_t \\ \kappa_t^* \end{pmatrix}, \quad t=1, \dots, T \quad (6)$$

where λ_c is the frequency, in radians, in the range $0 \leq \lambda_c \leq \pi$, ρ is the damping factor such that $0 < \rho \leq 1$. κ_t and κ_t^* are two white noise disturbances which are mutually uncorrelated with zero mean and common variance σ_κ^2 . Upon estimation, the hyperparameter which is shown is for the variance of the cycle itself, σ_ψ^2 , rather than σ_κ^2 . Note that in the limiting case, as $\rho \rightarrow 1$, (6) reduces to the deterministic but stationary cycle (Harvey, 1995).

Procedure

We begin by estimating equation 1 excluding any explanatory variables and with the trend, seasonal and cycle components modelled as specified by equations 2, 4 and 6 respectively. Following Harvey, we referred to this as the Basic Structural Model (BSM). The data is of quarterly frequency and spans from 1968 to 1997, that is, 1968:1 to 1997:4. The estimation period is 1968:1 - 1995:4, with the last two years reserved for out-of-sample forecasting. The initial BSM is estimated, respecified and estimated if necessary, until the components remaining are significant as indicated by the hyperparameter estimates and the final state vector. The emphasis is on a parsimonious model. In cases where more than one model survives, we use the Akaike Information Criterion (AIC) and the Bayes Information Criterion (BIC) to conclude the selection process. The model is then subjected to a battery of standard diagnostic tests, these include, the Box-Ljung statistic (Q-statistic) and Durbin-Waston (DW) for autocorrelation in the residuals, and tests for heteroscedasticity and normality (see Harvey, 1989, pp 273-281, for further exposition). All these are output results of the estimation procedure and allow us to choose a data consistent model.

The strength of any forecasting model lies in its predictive powers. A well-fitted model does not necessarily translate into a good forecasting model. First we use the period 1993:1 - 1995:4 to produce one-step-ahead in-sample predictions which are compared with the actual values. The main criterion being the root mean square error (RMSE), where we check that the error lies within the prediction interval set at two RMSEs. An inspection of a plot of the actual and fitted values gives an indication as to the extent to which the model is picking up the turning points. We also checked whether the cumulative sum of standardised prediction errors (CUSUM) lies within its bounds. Another test statistic used here is the Chow test which checks for model consistency over that period. Once the model is well-behaved with the in-sample predictions, we then produce out-of-sample forecast for the period 1996:1 - 1997:4. The procedure here is to extrapolate over the two-year period not allowing for any updating. Again the criteria are as before.

The next phase of our analysis is to re-estimate the model and include the explanatory variable of equation 1. This is referred to in the results section as the General Structural Model (GSM). The above procedures of model selection, estimation and testing remain the same but a bit more is done in terms of forecasting. Here we allow the explanatory variables to increase or decrease by a percentage point or two and analyse the behaviour of our forecast.

5. Results

In this section we present the results pertaining to the US market in great detail, and the results for the other three markets but only in areas where these results differed significantly from the US's. All the results are summarised in the appendix in Table 2 for the BSM and in Table 3 for the GSM.

Arrivals from the US

The hyperparameter estimates indicate that the individual components of the BSM are indeed stochastic. The model exhibits some worrying autocorrelation in the disturbances and an inspection of the correlogram of the residuals show this up at lags 9 and 15 and again at lag 21. We thought of including lagged arrivals as an independent variable but for forecasting purposes this would restrict us to one-step-ahead predictions or to conditional forecasts based on replacing the lagged variable with its predictions. Since the amount of autocorrelation is small, we decided to go for the freedom in forecasting. The model passed the other diagnostic tests although the normality statistic is a bit high. Figure 2 contains a plot of the individual components. The first graph shows the trend; there is a dramatic downturn in US arrivals around 1987 reflecting a shift in marketing efforts and economic recession in that economy¹. This is confirmed in the third graph which shows the annualised growth rate of the trend. There is an upturn in the trend around 1992, this again we know to be promotional efforts in that market. The growth rate at the end of the period is 2.4% per annum. The graph in the lower right corner shows the seasonal component in terms of the multiplicative effect on the

trend. Tourist arrival is on average 15.4% above its underlying trend in winter, falls below in spring, and some growth in summer which reaches a level about 2% higher than its trend in autumn. All this is consistent with observations of tourism behaviour.

The BSM performed well with in-sample one-step-ahead predictions (Figure 3). The graph top right shows that the fitted values followed the actual data quite closely, only in 1994:2 and 1994:3 were there some deviation but still within the prediction interval as shown in the bottom left graph. The Chow test statistic which take the value 0.7056 is also satisfactory.

Figure 4 shows the out-of-sample forecast for arrivals based on the fitted BSM. The first graph show the forecasts when we project on the trend alone, allowing for seasonality give us the forecasts shown in the bottom left graph. The final graph presents this with a band of one RMSE on either side. The smallest percentage forecast error was in the first quarter of 1994 and the largest for 1996 was 9.2% in quarter 3 and this increased to 17.9% in quarter 3 for 1997. This reflects the greater uncertainty as we increase the forecast period and indicates that in practice we will need to update the model consistently as new data becomes available.

For our GSM, the elasticity of demand with respect to real GDP in the US is the only significant explanatory variable. It indicates that a one percentage point increase in real income in that country would result in a 2.26% increase in tourist arrivals from that market. The model performed good in the diagnostic test as before and the normality statistic has improved tremendously, but there is still some autocorrelation.

The prediction errors from the in-sample prediction for the GSM were on average smaller than those of the BSM, and in some cases were half in size. There was no significant difference in the two models for out-of-sample forecasting. Simulations based on 1% faster growth rate in the GDP of the US and, as an alternative, a 1% slower growth rate, confirmed the significant effect of real GDP on tourist arrivals. The growth of arrivals accelerates or decelerates in line with the changes in real GDP.

¹See the Barbados Economic review (Publication of CBB) for further details on the behaviour of tourism during the periods mentioned here.

Arrivals from the UK

The hyperparameter estimates indicate that both the slope and irregular component were non-stochastic. The re-estimated contained a stochastic level, a stochastic seasonal, 2 stochastic cycles and a fixed slope. The model converged after only three iterations. The Q-statistic, which is based on the first 13 residual autocorrelation and tested against a chi-square of 6 degrees of freedom, took on a value of 16.23 with a p value of 0.012 indicated some degree of correlation. An investigation of the correlogram show up spikes at lags 9, 15 and 17.

The plot of the indicates an almost perfect 7 year cycle. The other cycle has a period of 1.73 years, but is the more prominent one accounting for approximately 1.48% of the trend, whereas the seven-year cycle only account for 0.47% of the trend. The winter season declining drastically for most of the sample period with an upturn around 1991 while the reversed occurred in the summer season. The shift can be attributed to an influx of cricket fans for the now earlier games, cheaper airfares, more charters and intensified marketing. The end of period analysis indicates that on average arrivals from UK in the winter is 14% below the underlying trend and in summer 14.2% above, while the other two seasons are roughly in line with the trend.

The BSM passed both the in-sample and out-of-sample forecasts test with the out-of-sample forecast errors all lying within 1 RMSE.

Again, the only remaining significant explanatory variable in the GSM was real income in the UK with a coefficient of 1.51, while the unobserved components were the seasonal and an AR(1) component. Except for the normality test which was a bit low (1.891), the model did well with the diagnostic tests. Figure 5 indicates that the income variable and tourist arrivals variable for the UK are both trending upwards (top graphs). But closer inspection shows that the two series have similar patterns with the arrivals series containing more variation which can be interpreted as seasonality. The corresponding variables for the US do not exhibit the same pattern. It is therefore no surprise that the estimates of the standard deviations of the disturbances driving the level and slope are non-zero. The inclusion of GDP is taking the effect

of the trend component. The rho coefficient on the AR term is 0.998. Its inclusion indicates that the model is nonstationary and could have been estimated in first differences, but this plays a less prominent role in structural time series modelling (see Harvey et al, 1995).

The GSM did well in both the in-sample and out-of-sample forecasts. Under GDP simulations the pattern of expansion remained the same as in the US market.

Arrivals from Canada

The BSM contained stochastic trend, seasonal and irregular components. It fitted the data well and passed all the diagnostic tests. Seasonality plays a dominant role in explaining Canadian arrivals with a seasonal χ^2 value of 175.53 on 3 df and a p value of 0.00. On average arrivals are 70% and 21% above the underlying trend in winter and autumn respectively and 25% and 33% below in spring and summer. Canadian tourist travel to get away from the cold.

The components of the BSM remained significant in the GSM. The real income elasticity of demand is 3.13. The relative price of tourism is marginally significant with a low elasticity of -0.18. We did forecast simulations based on 1, 2 and 3% growth and decline in the price of tourism relative to all other prices. Higher relative prices slowed the growth in arrivals and a more attractive price of tourism accelerates the growth. Unlike GDP, unfavourable prices did not cause a decline, it only slows down the growth. Maybe there exist a threshold on prices after which arrivals would decline. We would need to do some simulations at higher growth rates to confirm this.

Other Arrivals

The BSM fitted here is the same as in the Canadian market. For the GSM, since most 'other visitors' come from Europe, we assume that the growth performance of the European source countries converges on German growth. The real GDP of Germany is therefore used as a proxy. The elasticity of demand with respect to this variable is significant at the 5% level with a value of 0.96. Relative prices also have a significant effect with an elasticity of -0.3. The

estimated standard deviation of the level is zero hence a fixed level is specified. The model still contained some autocorrelation (Q-statistic value of 9.799 for first 9 lags and tested at 6 df).

The in-sample predictions were good, keeping in line with our previous models. But the out-of-sample forecast was somewhat off, lying outside the prediction interval for 5 of the 8 quarters. The out-of-sample forecast for the BSM out performed those of the GSM.

6. Concluding Remarks

We have been able to build reliable forecasting models for tourist arrivals to Barbados from its major markets. By employing Structural Time Series Modelling we have been able to capture most of the information that is normally left in the residuals of the common tourism demand regression. But, unlike the Dharmaratne study, we have been able to do so with components which have direct interpretations and which can give the planner further insights into the tourism behaviour. Furthermore, the methodology allowed these components to vary over time. This has proven particularly important in terms of seasonality which is a dominant feature in the data and has been treated unsatisfactorily in previous models. We have also obtained improved results from the explanatory variables included. In particular, the sign on the coefficient of the relative price variable turned up correct.

There is further research to be done in modelling the explanatory variables. It is rather strange that most studies focus on demand rather than supply. However, to get a richer forecast model we ought to consider the supply of tourism services. Demand studies have taken the price of tourism as given, but it is expected that prices response to market conditions. Hence, further insight can be gain by modelling the price of tourism as responding to supply conditions such as labour cost, interest rates and occupancy rates. This can be done by setting up a pair of seemingly unrelated time series equations (Harvey, 1995) where both price and arrivals are modelled.

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Appendix

Table 1 Studies of Tourism Demand for the Caribbean

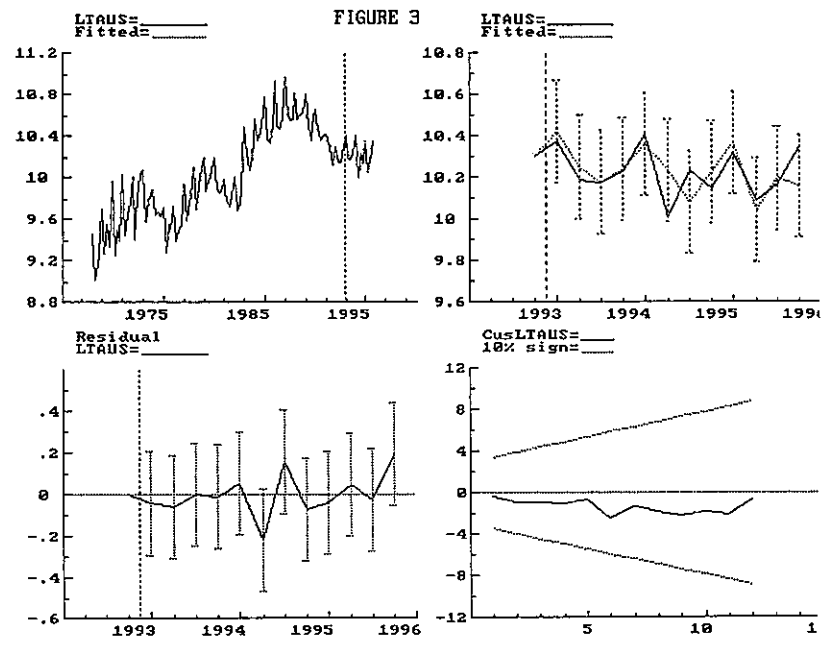
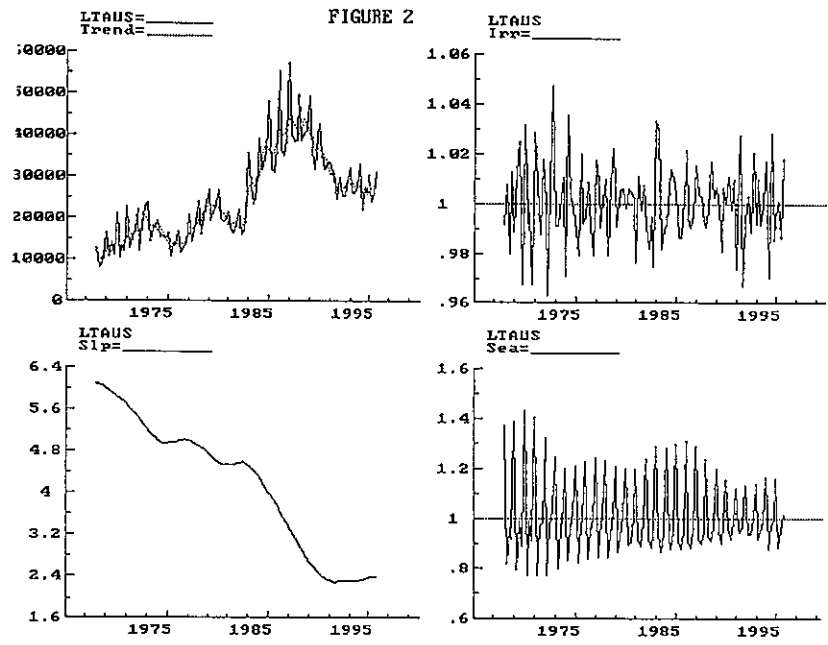
Author(s)	Variable(s)	Methodology	Results
Clarke et al (1986)	hotel rates, airfares, real GDP - source country, govt grants for promotion.	Regression Analysis, Annual (1956-1983), Arrivals from US, UK & Canada to Barbados.	real GDP significant in all cases, airfares - significant for UK only.
Rosensweig (1988)	relative prices of destinations	Regression Analysis, Annual (1964-83), Estimates US and world demand for Caribbean tourism services relative to tourism services in Mexico and Europe.	The Caribbean elasticities are very high, 1.33 for visitors from the US and 2.45 for visitors from around the world.
Belchere (1988)	US real GDP at state levels	Regression Analysis, Annual (1960-1985), US demand for tourism services in the Bahamas.	All income elasticities are significant
Metzgen-Quemarez (1990)	US real GDP, travel prices, prices of non-Caribbean destinations,	Regression Analysis, Annual (1964-84), US demand for tourism services the Bahamas, Jamaica and the Netherlands Antilles.	real GDP always influential. travel prices and competitors' price are usually significant but they do not have the expected sign.
Carey (1991)	income in source country, promotional expenditure,	Panel Data Analysis, 138 Quarterly observations, Arrivals for Aruba, Bahamas, Dominica, St. Lucia and St. Vincent.	income is always significant, promotional expenditure is significant for 3 of the five destinations.
IMF study (1992)	relative prices of destinations, GNP/ capita - source country, cost of travel (proxied by the price of oil),	Regression Analysis, Annual (1963-90), Arrivals from France, Germany, UK, US and Canada to the Netherlands Antilles, the Bahamas, Barbados, Trinidad & Tobago, and Jamaica.	relative price are significant the Netherlands Antilles and the Bahamas but they have the wrong sign. GNP is always significant.

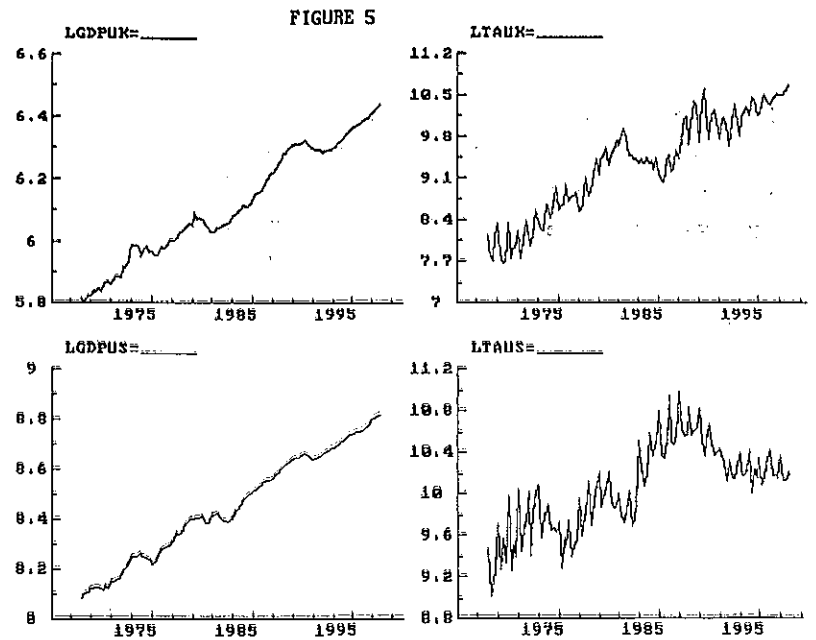
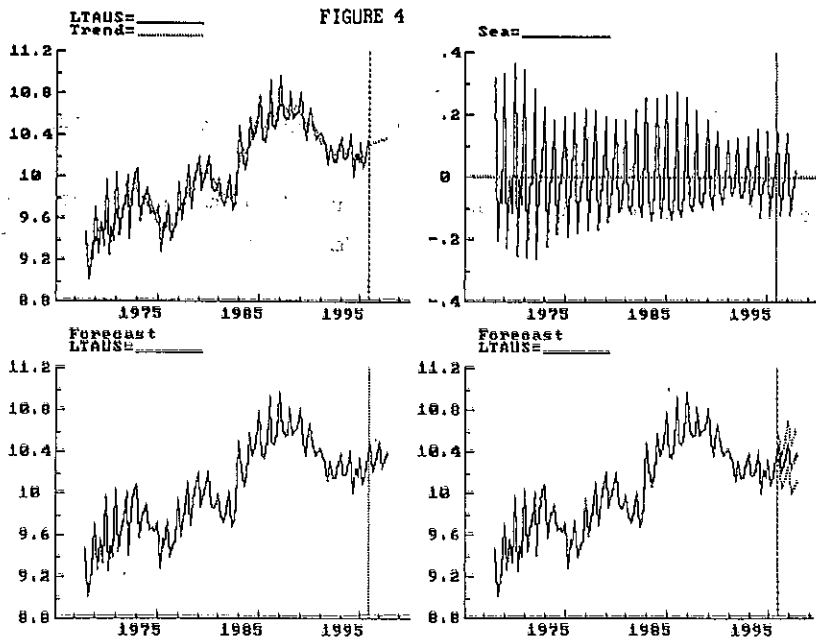
Table 2 BSM

Hyperparameters	US		UK		CANADA		OTHER	
	SD	q-ratio	SD	q-ratio	SD	q-ratio	SD	q-ratio
(level) q_{η}	0.079	1.0000	0.098	1.0000	0.0719	1.0000	0.0483	1.0000
(slope) q_{ξ}	0.001	0.0199			0.0045	0.0639	0.0035	0.0744
(Season) q_{ω}	0.013	0.01716	0.027	0.2833	0.0198	0.2765	0.0122	0.2540
(Cycle) q_{ψ} 1			0.032	0.3317				
2			0.002	0.0160				
3								
Coefficients	Value	t-value	Value	t-value	Value	t-value	Value	t-value
Level	10.313	204.48	10.415	138.55	9.4521	190.72	10.541	251.26
Slope	0.0059	0.5261	0.0278	2.4329	0.0015	0.8853	0.0086	0.6449
Season 1	0.0069	1.9512	-0.033	-0.542	0.2304	5.7223	0.0324	1.0851
Season 2	0.095	2.2099	-0.142	-2.213	0.4738	0.0484	-0.0729	-2.2945
Season 3	-0.048	-1.729	0.0092	0.218	-0.059	-1.9117	-0.0605	-2.5062
Diagnostic Tests								
Normality	3.182		0.82624		3.231		1.040	
H(35)	2.047		1.239		0.82644		1.093	
DW	2.047		1.850		1.849		1.867	
Q-Statistic	21.00	Q(9,7)	16.23	Q(13,6)	5.180	Q(9,6)	9.89	Q(9,6)
Rs ²	0.27043		0.46546		0.38911		0.49888	
Rd ²	0.781077		0.5606*		0.96394		0.860912	

Table 3 GSM

Hyperparameters	US		UK		CANADA		OTHER	
	SD	q-ratio	SD	q-ratio	SD	q-ratio	SD	q-ratio
(level) q_{η}	0.050	0.7281			0.0578	0.7220		
(slope) q_{ξ}					0.0032	0.0554	0.0247	0.4980
(Season) q_{ω}	0.0122	0.1765	0.0303	0.2677	0.0187	0.3242	0.0127	0.2564
(Cycle) q_{ψ} 1								
2								
3								
Coefficients	Value	t-value	Value	t-value	Value	t-value	Value	t-value
Level	-9.47	-1.729			-8.58	-1.9142	2.344	1.784
Slope					-0.017	-0.722	0.037	1.332
Season 1	0.077	2.2441	-0.04	-1.678	0.2303	5.5987	0.033	1.1076
Season 2	0.081	2.2702	-0.137	-2.135	0.4696	11.049	-0.075	-2.2389
Season 3	-0.042	-1.662	0.007	0.1743	-0.0551	-1.746	0.0598	-2.238
lnGDP	2.268	3.2346	1.512	5.0505	3.1342	3.3893	0.9681	2.2898
ln(P _{tour} /P _i)					-0.1841	-1.734	-0.3131	-0.164
ln(P _{tour} /P _{com})								
Diagnostic Tests								
Normality	2.985		1.891		2.748		1.242	
H(35)	0.58009		1.126		0.79596		0.93281	
DW	1.920		1.822		1.839		1.930	
Q-Statistic	17.28		12.78		7.364		9.799	
Rs ²	0.33042	Q(9,7)	0.42219	Q(9,7)	0.45936	Q(9,6)	0.52231	Q(9,6)
Rd ²	0.799078		0.528998		0.968091		0.867665	





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