How to cite: Petrevska, B. (2011). Economic Planning of Tourism Demand in Macedonia, *Economic Development*, 3/2010, 133-145.

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Economic planning of tourism demand in Macedonia

Abstract

The concept of economic planning of tourism development could not be applied if forecasting of tourism demand is neglected. The importance of application of quantitative forecasting methods is enormous when dealing with projection of future tourism trends. In that respect, the method of exponential smoothing is applied through the following variants: Double Exponential Smoothing (DES) and the Holt -Winters Smoothing (HWS). The forecast evaluation emphasizes that the DES model is more accurate and thus recommends for forecasting the number of foreign tourists in Macedonia in the period 2009 - 2014.

Furthermore, the paper identifies the lack of global concept for tourism development in Macedonia and recommends application of tourism planning as a key factor for enhancement of tourism sector.

Key words: economic planning, tourism, tourism demand, forecasting, Macedonia.

1. Introduction

The variety of changes in the surrounding initiated creation of new ambient and challenges in front of all parties involved in the tourism policy of Macedonia. Consequently, the issue of defining innovative presumptions and general directions for tourism development in future has been raised. In this regard the necessity of implementing a brand new approach in the tourism activity has been introduced in order to provoke maximal contribution to the economic development of Macedonia.

Thus it means application of the economic planning concept and creation of competitive tourism product. In that direction, it is necessary to define the advantages, as well as the obstacles in tourism development of Macedonia. Considerable attention may be dedicated to tourism demand, with an emphasis on necessity for accurate forecast. Simultaneously, the possibility of applying quantitative methods and models for forecasting has exceptional significance for forecasting future tourism demand in Macedonia. From this reason, from the variety of quantitative methods, the paper addresses the possibility, but at the same time, the precondition of practical appliance of certain models of exponential smoothing method when dealing the issue of forecasting tourism demand in Macedonia.

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2. Obstacles in tourism demand forecasting

Having in mind that the tourism demand includes all industries of the national economy, and is not based only on one element, clearly indicates vast obstacles present in the attempt of tourism demand estimations. Namely, all difficulties during determination of tourism demand quantity and thus to tourism industry quantity, consequently reflect on the tourism demand forecasting.

In that respect, it may be noted that measuring the tourism immensity and measuring the tourism participation in the GDP, is two different values which need to be treated separately. At the same time, tourism extension may be foreseen in best manner by measuring an effective tourism demand, while the contribution of tourism within the national economy of a country, may be perceived by the tourism participation in the GDP.

In the process estimating tourism demand, many obstacles and difficulties with various character and nature are present. The most recent ones are:

- *Lack of historical data* – most forecasting methods require a minimum of five or ten years of data for forecasting, even much more. Unavailability of statistical data for vast independent variables is top problem while predicting tourism demand.
- *Tourism demand can be volatile* – Visitor volumes fluctuate with the seasons and over annual periods, and often produce wide variations. The more volatility there is in an activity, the more difficult it is to discern patterns that can help in forecasting futures.
- *Wide choice of forecast variables* – for ex: number of tourists arrivals, number of nights spent, tourism consumption etc., which usage differs according to the forecasting model.

Undoubtedly, forecasting tourism demand is a complex process based on applying variety of forecasting methods and models. Furthermore, it should be pointed out that often in a forecasting process certain events and impacts cannot be predicted: financial crises, terrorist attacks, war conflicts and crisis, epidemics etc. Consequently, the expected results are not precise, which on the other hand, leads to inappropriate application of tourism development economic planning process, in general.

In forecasting tourism demand, it is expected that the final model chosen for forecasting will produce projections that are as precise as possible. However, it is not always the case due to following reasons: data limitations, measurement errors, unclear picture of the system of tourism demand etc. Even when an ideal forecasting model can be identified, it can only serve as an approximation for complex tourists' behavior, for it is possible that tourists' decisions change reflecting the changes in preferences, motivation or economic shocks. Hence, the planner should always be prepared to make a revision on the previously identified and defined model, to the newly created changes. Obviously the further in time the forecasts are made, the more likely it is that the prediction will be wrong. Nevertheless, evidence suggests that forecasts based on expert judgment are seldom accurate. Indeed, there is a very large body of research suggesting that experts in various areas rarely generate better predictions than non-experts who have received some training, and that the predictions of experts are completely outperformed by those made by simple statistical models.[1]

[1] Hall, Michael C.: The Future of Tourism Research, in: Tourism Research Methods: Integrating Theory with Practice, CABI Publishing, 2005, p. 222.

3. Importance of tourism demand forecasting

Due to the extensive competition and constant changes in the tourists' demands, it is not possible to act in successful manner without defining the goals and objectives on clear basis i.e. without tourism demand forecasting. We should always have in mind the complexity of the procedure and that the tourism researchers and practitioners are interested in it for the following reasons:[2]

First, tourism demand is the foundation on which all tourism-related business decisions ultimately rest. Companies, such as airlines, tour operators, hotels, cruise ship lines, and recreation facility providers are interested in the demand for their products by tourists. The success of many businesses depends largely or totally on the state of tourism demand, and ultimate management failure is quite often due to the failure to meet market demand. Because of the key role of demand as a determinant for business profitability, estimations of expected future demand constitute a very important element in all planning activities. It is clear that accurate tourism demand forecasting is essential for efficient planning by tourism-related businesses, particularly given the perishable nature of the tourism product.

Second, tourism investment, especially investment in destination infrastructures, such as airports, highways and rail links, requires long-term financial commitments and the sunk costs can be very high if the investment projects fail to fulfill their design capacities. Therefore, the prediction of long-term demand for tourism-related infrastructure often forms an important part of project appraisal.

Third, government macroeconomic policies largely depend on the relative importance of individual sectors within a destination. Hence, accurate forecasts of demand in the tourism sector of the economy will help governments in formulating and implementing appropriate medium- to long-term tourism strategies.

The above noted clearly indicates the importance of tourism demand forecasting in a line of resulting with realistic and proven grounds for establishing and applying tourism development policy. Namely, "to make a comeback to the tourism market where you have once been is by all means extremely hard work, much harder than the first market entrance to which you were anonymous."[3]

Hence, tourism demand forecasting can be helpful to economic planners in reducing the risk of decisions regarding the future. In that respect, they can use demand forecasts to: [4]

- predict the economic, social/cultural, environmental consequences of visitors;
- assess the potential impact of regulatory policies, such as price regulation and environmental quality controls;
- project tourism public revenues for the budgeting process;
- ensure adequate capacity and infrastructure, including airports and airways, bridges and highways, and energy and water treatment utilities.

In short, sound tourism demand forecasting can reduce the risks in the decision-making process as well as the costs of attracting and serving the travelling public. In addition, it is undoubtedly that the tourism demand is the basic indicator for the success of the tourism destination in attracting tourists. Therefore, all planning activities are focused on enlargement or control over the tourism demand. Thus, it is essential to introduce all affecting components and factors in order to identify and forecast tourism demand in the most appropriate manner.

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[2] Song, Haiyan and Lindsay Turner: Tourism Demand Forecasting, in: International Handbook on the Economics of Tourism, Edward Elgar Publishing Ltd., 2006, p. 89.

[3] Borkovic-Vrtiprah, Vesna and Mihovil Racic: Forecasting tourism in Croatia with selected forecasting models, Hotel in tourism destination, Book I, Opatija, 1998, p. 426.

[4] Frechtling, Douglas C., Forecasting Tourism Demand: Methods and Strategies, Butterworth-Heinemann, 2001, p. 10.

4. Selecting methods and models for tourism demand forecasting

Selecting an appropriate method and model for forecasting tourism demand, is a very complex issue, primarily because the ability to forecast the future cannot be assessed until it really happens and until there is sufficient time to measure it. Consequently, in the preparatory phase for selecting forecasting method and model, it is necessary to gain starting information regarding their relevance. In that line, certain evaluation criteria are used in order to eliminate the inappropriate ones and to select potential starting methods, as well as to identify an adequate model for the forecasting process.

In that respect, a *forecasting method* refers to simply a systematic way of organizing information from the past to infer the occurrence of an event in the future. 'Systematic' means following a distinct set of procedures in a prescribed sequence. On the other hand, a *forecasting model* is one expression of a forecasting method. More specifically, it is a simplified representation of reality, comprising a set of relationships, historical information on these relationships, and procedures to project these relationships into the future.[5]

Consequently, after selecting a forecasting method, it is the common practice to test several models incorporating the assumptions of the given method in order to find the most accurate one.

The literature review is full of different classifications when dealing the issue of methods for tourism demand forecasting. Moreover, as commonly accepted classification of tourism demand forecasting methods is: the group of quantitative methods and the group of qualitative ones. Quantitative methods are based on mathematical and statistical rules, while qualitative methods are also called judgmental methods. Namely, past information about the forecast variable is organized by experts using their judgmental rather than mathematical rules. These are not necessarily cheaper or easier to apply than quantitative methods, but they have the advantage of not requiring historical data series.

Furthermore, in the frames of each of these groups of forecasting methods, there is a vast number of changeable alternatives representing forecasting models. The most satisfactory and successful methods are those which involve both, a detailed and rigorous analysis of past experience and a study of present consumer attitudes combined with the intuitive insight of expert opinion. However, such a comprehensive method is rarely employed, but models from the first group of methods are mostly applied due to the possibility to produce more adequate and more realistic outcomes.

Which method will be used in tourism demand forecasting depends on the specific aim of the study, the financial means, the data available, the time period over which the forecast is to operate etc. Some models are more suitable for providing predictions of a general nature, whereas others can be used to analyse particular aspects of demand, such as the demand for package tours to a particular resort.[6]

5. Quantitative methods for tourism demand forecasting

Quantitative methods organize past information about a phenomenon by mathematical rules. These rules take advantage of underlying patterns and relationships in the data of interest to the forecaster. Objective numerical measurements consistent over some historical period are required in these methods. These methods also assume that at least some elements

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[5] Frechtling, Douglas C.: Forecasting Tourism Demand: Methods and Strategies, Butterworth - Heinemann, 2001, p. 21.

[6] Vanhove, Norbert: Tourism Planning: Economic Instruments - An Evaluation at the Project Level, Tourism Planning of the Eighties, Edition AIEST, Vol. 19, Berne, 1978, p. 30.

of past patterns will continue into the future.

There are two major subcategories of quantitative methods: extrapolative and causal.

(1) Extrapolative methods, also called 'time series methods', assume that the variable's past course is the key into predicting its future. Patterns in the data during the past are used to project or extrapolate future values. Causal relationships are ignored. These methods are particularly used for forecasting tourism demand of products/services with a relatively stable demand. Although, the influence of different factors on the tourism development movement is neglected, they produce relatively accurate results, especially on short-term evaluations.

(2) Causal methods attempt mathematically to simulate cause-and-effect relationships. Determining the causal variables (better called 'explanatory variables') that affect the forecast variable and the appropriate mathematical expression of this relationship is the central objective. These methods have the advantage over time series methods of explicitly portraying cause-and-effect relationships. This is crucial in certain forecasting situations, such as when management wants to know how much impact on demand an increased advertising budget will have. Likewise tourism policy forecasting requires causal models. However, these methods are more costly and time-consuming to construct than time series models, and are often considerably less accurate.

Tourism demand can be measured in a variety of units, including a national currency, arrivals, nights, days, distance travelled, passenger-seats occupied etc. Each of the various methods has its own strengths and weaknesses. Some are best when applying plenty of data to work with and it can present factors affecting tourism demand in the best manner. Others are superior when little is known about the past, or the future we are interested in is distant. Some forecasting methods take little time and knowledge, while others require a detailed understanding of their intricacies. There are numerous examples which indicate limited appliance of the forecasting methods and models and suggest precaution measures in interpretation of the final estimated values.

6. Forecasting tourism demand in Macedonia

We forecast the tourism demand in Macedonia, represented by the number of foreign tourists, for the period 2009-2014 employing the method of exponential smoothing. This method can be applied in many variants, but for the purposes of this research, the following two are used: the Double Exponential Smoothing (DES) and the Holt-Winters Smoothing (HWS). Both models can be used when dealing with short time series with linear trend and no seasonality. In that respect, we do the modelling with short time series with an upward trend in the period 2001-2008.

Table 1: Number of foreign tourists in Macedonia

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
Arrivals	224 016	98 946	122 861	157 692	165 306	197 216	202 357	230 080	254 957

Source: State Statistical Office, Statistical Yearbook of Republic of Macedonia, 2008 and State Statistical Office, Statistical Overview: Transport, Tourism and Other Services in Republic of Macedonia 2004-2008, 2009.

The DES model is actually an exponential smoothing of second order. This model is optimal for smoothing processes with linear trend. Similarly, it uses the same constant for smoothing the level and trend of the series, which is actually its basic characteristics, but also its weakest point. At the same time, it has to be pointed out that the model smoothes the oscillations in the series, enabling it to react on structural changes in the shortest possible time.

The equations for the DES model are:

Level: $L_t = \alpha A_t + (1 - \alpha)(L_{t-1} + b_{t-1})$ (1)

Trend: $b_t = \alpha (L_t - L_{t-1}) + (1 - \alpha) b_{t-1}$ (2)

Forecast: $F_{t+h} = L_t + hb_t$ (3)

It is commonly used that the constant has value of 0.2 or less. Despite the fact that the choice of the value of the constant is pretty much limited, it can be used in obtaining more accurate forecasting results. The calculations are:

Constanta value = 0.182

Trend = 22 636

The Holt-Winters model is very similar to DES model, since it can be applied in series with linear trend in the movement with no seasonality. The difference is that the HWS model is base on two smoothing constants, while the DES model uses only one because of its simplicity. But, on the other hand, due to the greater flexibility, the HWS model is considered as more accurate for forecasting.

The HWS model uses the following equations:

Level: $L_t = \alpha A_t + (1 - \alpha)(L_{t-1} + b_{t-1})$ (4)

Trend: $b_t = \beta (L_t - L_{t-1}) + (1 - \beta) b_{t-1}$ (5)

Forecast: $F_{t+h} = L_t + hb_t$ (6)

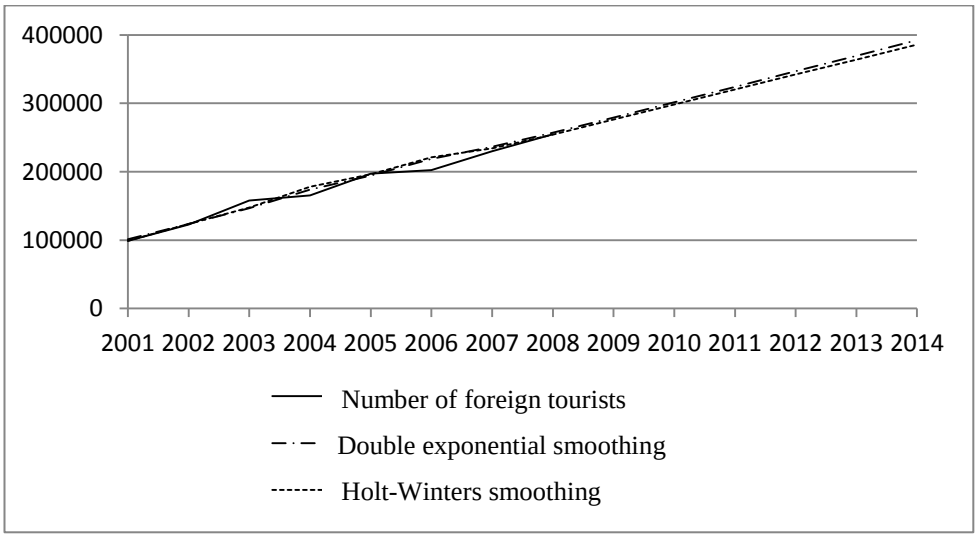
The calculations are:

First smoothing constant (α) = 0.48

Second smoothing constant (β) = 0.23

Trend = 21 887

Chart 1: Forecasting tourism demand in Macedonia



It is noticeable from Chart 1 that both forecasting models produce satisfactory results since they follow very closely the actual time series in the sample period.

Table 2: Forecasting tourism demand in Macedonia

Model	2009	2010	2011	2012	2013	2014
DES	278 927	301 565	324 203	346 840	369 478	392 116
HWS	276 374	298 261	320 148	342 035	363 922	385 809

From Table 2 it can be concluded that both models have similar forecasting results. According to DES model, the number of foreign tourists in Macedonia for the period 2009 – 2014 is projected to be within the interval of 279 000 – 390 000 tourists. Based on this model, the number of foreign tourists in the following six years will increase for 120 000.

The HWS model forecasts that the number of foreign tourists in the 6-year period will be within the interval of 276 000 – 386 000 tourists. So, based on this projection the number of foreign tourists in Macedonia will increase for 100 000.

Both models are very often used for tourism demand forecasting, mainly because of their accuracy and simplicity in the implementation procedure. Simultaneously, their advantage lies in the ability to follow the linear trend of the original time series as well as to be used in medium-run estimations. However, the biggest disadvantage is their inappropriateness in forecasting time series with seasonality components or without linear trend. In such cases, other models of exponential smoothing are used: simple exponential smoothing, Holt-Winters multiple smoothing (with three parameters) etc.

7. Evaluation of the models

Having in mind that the primary purpose of building a forecasting model is to clearly discern the future of a phenomenon, the most important criterion is how accurately a model does this, i.e. how closely the estimations provided by the model conform to the actual events being forecasted.

In that respect, in order to define which of two implemented models of the exponential smoothing method is more accurate in forecasting the tourism demand in Macedonia, the forecasts are evaluated by means of the standard indicators:

- Root Mean Squared Error (RMSE),
- Mean Absolute Error (MAE),
- Mean Absolute Percentage Error (MAPE) and
- Theil Inequality Coefficient (TIC).

The root mean squared error indicates the average forecasting error, which is calculated by taking the square of individual forecast errors in order to avoid the problem of offsetting positive and negative errors.

$$RMSE = \sqrt{\frac{1}{h}\sum_{t=T}^{T+h}(\hat{y}_t - y_t)^2}$$

Contrary to the RMSE, the mean absolute error resolves the problem of positive and negative errors by taking them in absolute value.

$$MAE = \frac{1}{h}\sum_{t=T}^{T+h}|\hat{y}_t - y_t|$$

The basic weakness of the above noted indicators is that they cannot be used in comparing errors in forecasting the time series expressed in different values. For that purpose, the mean absolute percentage error is used, which expresses the forecasting errors in percent of the values of the original series.

$$MAPE = \frac{1}{h}\sum_{t=T}^{T+h}\left|\frac{\hat{y}_t - y_t}{y_t}\right|$$

The Theil Inequality Coefficient can also be used for comparing errors in forecasting the time series expressed in different values. Specifically, this coefficient builds on the root means squared error and its value lies between 0 and 1.

$$TIC = \frac{\sqrt{\frac{1}{h}\sum(\hat{y}_t - y_t)^2}}{\sqrt{\frac{1}{h}\sum \hat{y}_t^2} + \sqrt{\frac{1}{h}\sum y_t^2}}$$

The calculated values of all mentioned indicators for evaluating the forecasting model accuracy are presented in Table 3.

Table 3: Evaluation of tourism demand forecasting in Macedonia

	Root Mean Squared Error	Mean Absolute Error	Mean Absolute Percentage Error	Theil Inequality Coefficient
DES	6 090.83	9 986.78	4.79	0.0134
HWS	9 920.87	13 150.95	5.94	0.0217

Comparing the values of calculated errors of DES and HWS model, it can easily be concluded that the DES model is more accurate model of exponential smoothing. Having in mind that the DES model is very simple for implementation, leads us to additional advantage for its choice as a leading model for forecasting tourism demand in Macedonia. According to DES model, the number of foreign tourists in Macedonia for the period 2009-2014 will be in the interval from 280 000 – 390 000 tourists. Put side by side to 2008 when 255 000 foreign tourists visited Macedonia, it means 10-50% expected increase. Furthermore, it should be pointed out that the anticipated values must be taken in consideration with a large doze of precaution, since the model does not indicate the reasons which affect the forecasted results. This is very important, as these indicators have great influence on identifying and implementing measures and activities in order to create appropriate tourism policy of the country.

8. Concluding remarks

The key to successful tourism development is in application of the concept of its planning. The economic development must not be the one and only priority country's goal, but should be complemented by other three main goals: satisfaction of tourists' needs; resource protection, as well as tourism integration within the socio-economic community development. The overall tourism planning policy should be equally oriented towards creation of quantity, but at the same time, towards improvement of quality as well. The resistance to introduction of economic planning concept is progressively disappearing, thus being more accepted and applied as guidelines for future tourism development.

Such complex concept cannot be implemented without predicting tourism demand. At the same time, many obstacles and difficulties occur during the process, such as: lack and data limitations; inconsistency and variable errors; application of large number of variables; lack of knowledge for tourism demand system etc.

Forecasting tourism demand is important since it is the base for: creating achievable

tourism policy; creating adequate regional development policy; formulating and implementing tourism strategy etc. Forecasting accuracy depends on characteristics of applied methods and models. The projected results from different models may be compared to the realistic data, thus ensuring retrospective measurement of accuracy of applied model.

The number of foreign tourists is the basic variable for forecasting tourism demand in Macedonia for the period 2009-2014. In this regard, a relatively simple qualitative model easy for practical usage, is applied. However, the model does not indicate the reasons which may affect the projected results, which on the other hand, have high influence on identifying measures and activities necessary for creating solid tourism policy.

There is a lack of global concept for tourism development in Macedonia, as well as adequate general economic policy, especially developmental policy for supplementary sectors necessary for tourism follow-up development. Herein, tourism in Macedonia should be observed in broad, macroeconomic frames as specific market segment whose dimensions and economic content comprehensively may be interpreted within the quantity and structure of tourism expenditure. That is possible only by creating analytical frame for identifying all tourism impacts, and thus, to define objectively its position within the global development strategy in Macedonia.

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