FORECASTING OF THE VOLUME OF THE SPA AND WELLNESS TOURISM RECEIPTS IN THE SOUTH-WEST BULGARIA

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ABSTRACT

The present paper regards the application of some forecasting methods in regards to the SPA and Wellness tourism in South-West Bulgaria such as: the linear trend forecasting, the double exponential forecasting (the Holt's method), the ARIMA method, the naïve method and the indexed naïve method. Specially designed model for estimation of the weight coefficient needed for determining the size of the sector of the SPA and Wellness tourism in the time series of the available data and in the forecast values is being presented. Future and past predictions have been achieved based on statistical records of a time series of 18-year periods.

The present paper regards also several major problems in the application of the univariate forecasting methods for the purpose of the long-run forecasting of the volume of the tourism receives and especially the ones in the sub-sector of the SPA and Wellness tourism in South-West Bulgaria. These problems include as: (i) the problem of finding of a suitable general indicator; (ii) Determining the time series pattern, or the so-called "forecast profile" and selecting and using of suitable forecasting techniques; (iii) Calculating of short-run and long-run forecasts; (iv) comparing of the results of the forecast techniques on the basis of the errors in the forecasts; (v) Estimating the size of the SPA and Wellness tourism in South-West Bulgaria in certain terms, so that the forecast(s) of the above-mentioned general indicator could be particularized especially for regarded sub-sector and region. The results from the different forecasting methods and techniques are being presented and conclusions are drawn on the reliability of the achieved forecasts.

Keywords: SPA and Wellness Tourism, Exponential Forecasting, Economic Cycles, South-West Bulgaria.

JEL Classification: Z32, Z33

1. INTRODUCTION

In the past eighteen years the Bulgarian tourism industry reached a stage of a bubbling increase, which was followed by the negative impact of the world financial and economic crisis combined with the Russian-Ukrainian conflict since 2014, the aftermath of the war in Syria and Iraq and the consequent deterioration of the Russian-Turkish business relations. In 2015 Bulgaria scored an overall increase in the total number of the tourism arrivals and yet the values of the indicators the "number of the foreign visitors with recreation and

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holiday aims" (the oldest one in the country) and the volume of tourism receipts (in Euros) were down with approximately 5 percent. Nevertheless, in these very same eighteen years, form 1998 to 2015, Bulgaria did succeeded to capitalize the good results achieved in certain subsectors of its tourism industry, such as the spa and well industry, and has recently lined up in the top three suppliers of spa and wellness services in Europe, alongside with France and Romania.

The fluctuations on the international tourism markets emitting tourists to Bulgaria, which were felt as a disturbing aftermath of the economic crisis, still provoke hesitations in the investment decisions of a significant part of the investors in the Bulgarian tourism industry (banks, investment funds, and holding companies). Further to this the significant decrease in the number of the Russian and Ukrainian tourists in 2014 led to a 30 to 50% in the occupancy rate of the Bulgarian Black sea summer hotels. Despite the expectation of a "back-wave" for the summer season of 2006, the fear that this decrease may spread over also to the winter and the spa and well subsectors of the Bulgarian tourism industry has been bringing additional uncertainty in the investors' decisions for past two years. This uncertainty and the fear of possible negative outcomes could be diminished to some extent if there are convincing and comparatively true long-run forecasts for what is to happen in the coming 10 to 15 years. And this refers also to the best performing sub-sectors of the Bulgarian tourism, i.e. the spa and wellness tourism.

2. OBJECTIVES

The task of creating a forecast model for the long-run development of the spa and wellness subsector of the tourism industry in Bulgaria meets with the solving of five major problems:

i) The problem of finding of a suitable general indicator;
ii) Determining the time series pattern, or the so-called "forecast profile" (Gardner, 1987, pp.174-175) (Hyndman *et al.*, 2008, pp.11-23) and selecting and using of suitable forecasting techniques;
iii) Calculating of short-run and long-run forecasts;
iv) Comparing of the results of the forecast techniques on the basis of the errors in the forecasts;
v) Estimating the size of the spa and wellness tourism in South-West Bulgaria in certain terms, so that the forecast(s) of the above-mentioned general indicator could be particularized especially for regarded sub-sector and region of the country.

3. A LITERATURE REVIEW ON THE TOPIC

The development and usage of the univariate and particularly of the exponential forecasting methods dates back from the works of R. G. Brown in the 1940's the results of which were published in 1959. These were further developed and expanded by C. C. Holt in 1957 and Peter Winters in 1960. In 1960s Pegles (1969) developed the first taxonomy for the classification of the available at that time exponential smoothing forecasting methods. In the 1980's Gardner (Gardner, 1985; 1987) presented some interesting techniques aimed at smoothing of the error residuals in the achieved forecasts. Gardner (1985) and Taylor (2003) also further expanded the opportunities for classifying the exponential smoothing forecasting methods according to so-called "forecasting profiles" or "forecasting patterns" (See also point 4).

The problem of the initialization of variables that are to be used in the exponential smoothing equations was also regarded by a numerous authors such as Ledolter and Abraham

(1984) and Hyndman (2014). In 2002 Hyndman, Koehler, Snyder, Grose, and later in 2008 Hyndman, Koehler, Ord and Snyder published there works on the usage of the so-called state-space approach in exponential smoothing.

In the years, the capacity of the univariative and particularly of the exponential forecasting methods to produce reliable forecast was further explored also by other researchers such Ledolter and Abraham (1984), Gardner and McKenzie (1985; 1988), Chatfield and Yar (1988), Hamilton (1994), Tashman and Kruk (1996), Delurgio (1998), Williams and Miller (1999), Tsay (2005) and many others.

In Bulgaria, up to the 1990's only a small portion of the univariate forecasting methods (actually the simplest ones) and the exponential smoothing methods were virtually unknown due to the weak English language skills of the researchers and the preference given in the field of forecasting to the multivariate forecasting methods and mainly the usage of French and Swedish econometric models. In 1996 Sirakov published a book named "Conjuncture and Forecasting of International Markets" in which an application of the Brown's single exponential smoothing was made in regards to the Bulgarian export of textile production equipment and machinery for the African countries and mainly in Nigeria. This application was however very narrow in scope. An Internet publication that that tried to make the exponential forecasting smoothing methods more popular in Bulgaria was made in 2007 by Ivanov form the New Bulgarian University as a part of his lecture course materials on business processes forecasting. Another try for a more explicit explanation and usage of the exponential forecasting methods and namely the Halt and Halt-Winters method was made in another book published in Bulgarian language by Mishev and Goev, i.e. "Statistical analysis of time series" (2012). Even here, however, the theoretical presentation of the regarded method was limited and narrowed to the practical application of several software packages. In the field of the Bulgarian tourism, the publish studies in the application of the exponential smoothing methods are also limited to some few papers dealing with the application of the Halt and Halt-Winters method for forecasting of the number of tourism arrivals in certain areas and in the country as a whole. Among them, the topic of forecasting of the tourism receipts was regarded by Dimitrov *et al.* (2015). And the topic of forecasting of the spa and wellness tourism development in Bulgaria was a subject also of two publications by Dimitrov (2012 and by Dimitrov and Stoyanova (2015).

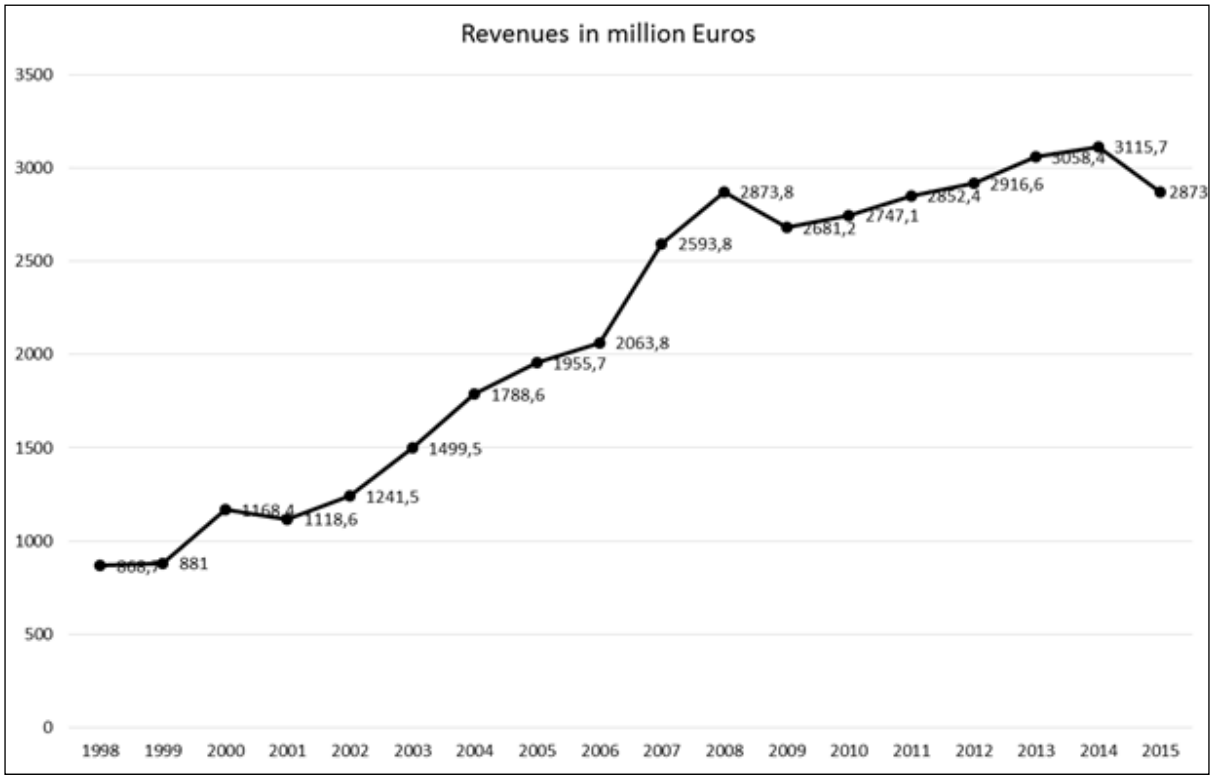
4. METHODOLOGY

With regards to the first problem set in the previous point of the present paper, the difficulties in finding of a general suitable indicator, on the basis of which to make the forecast, come mainly from the reliability and the sustainability of the existing data for the separate types of indicators for tourism demand, especially in terms of time. A greater part of the existing indicators are inconsistent in time and they lack enough data which would allow the building of sufficiently long time series (Dimitrov, 2010; Stankova, 2010; Filipova; 2010). Here one could refer to certain indicators such as the "number of the tourism arrivals" or the "volume of the tourism receipts", which was calculated for different periods of time in different currencies – non-denominated Bulgarian leva, US dollars, German marks and Euros. In the end of 1990s the Republic of Bulgaria adopted the UNWTO definition of these very same indicators and continued collecting statistical data up the scope of these definitions. Taking into account the annual data available for the indicator "volume of the tourism receipts", one can build a time series of 18 time periods (Figure 1) – from 1998 to the last year with recorded value 2015.

A more detailed visual review of the regarded times series on the basis of the fluctuations maxima and minima shows out that there are two types of cycles inherent in the time series, namely: (i) the Kitchin cycles of 3 to 5 years (Kitchin, 1923) and (ii) the Juglar cycles of 7 to 11 years (Juglar, 1862).

The second problem of determining the times series pattern, or the so-called times series' "forecast profile" is evoked by the necessity to choose, when making a reasonable and objective forecast, the best applicable forecasting method or the best applicable set of forecasting methods.

Figure 1. The volume of Bulgaria's tourism receipts for the period 1998 - 2015



Source: authors' own calculations based on data provided by the Bulgarian Ministry of Tourism and the Bulgarian National Statistical Institute

The problem of determining the times series pattern is usually solved by the comparing the graphical form of the times series in regard with a pre-set classification of diagrams or a table classification with a mathematical or symbol notations of the time series types of development curves. As Hyndman, Koehler, Ord and Snyder point out (Hyndman *et al.*, 2008, pp. 11-12), this classifications originated with Pegles' taxonomy (Pegles, 1969, pp. 311-315). This was later extended by Gardner (Gardner, 1985, pp. 1-28) and modified by Hyndman *et al.* (2008) and extended by Taylor (Taylor, 2003, pp. 715-725) giving a classification set of fifteen forecast profiles (forecast patterns) and the corresponding to them methods (Table 1).

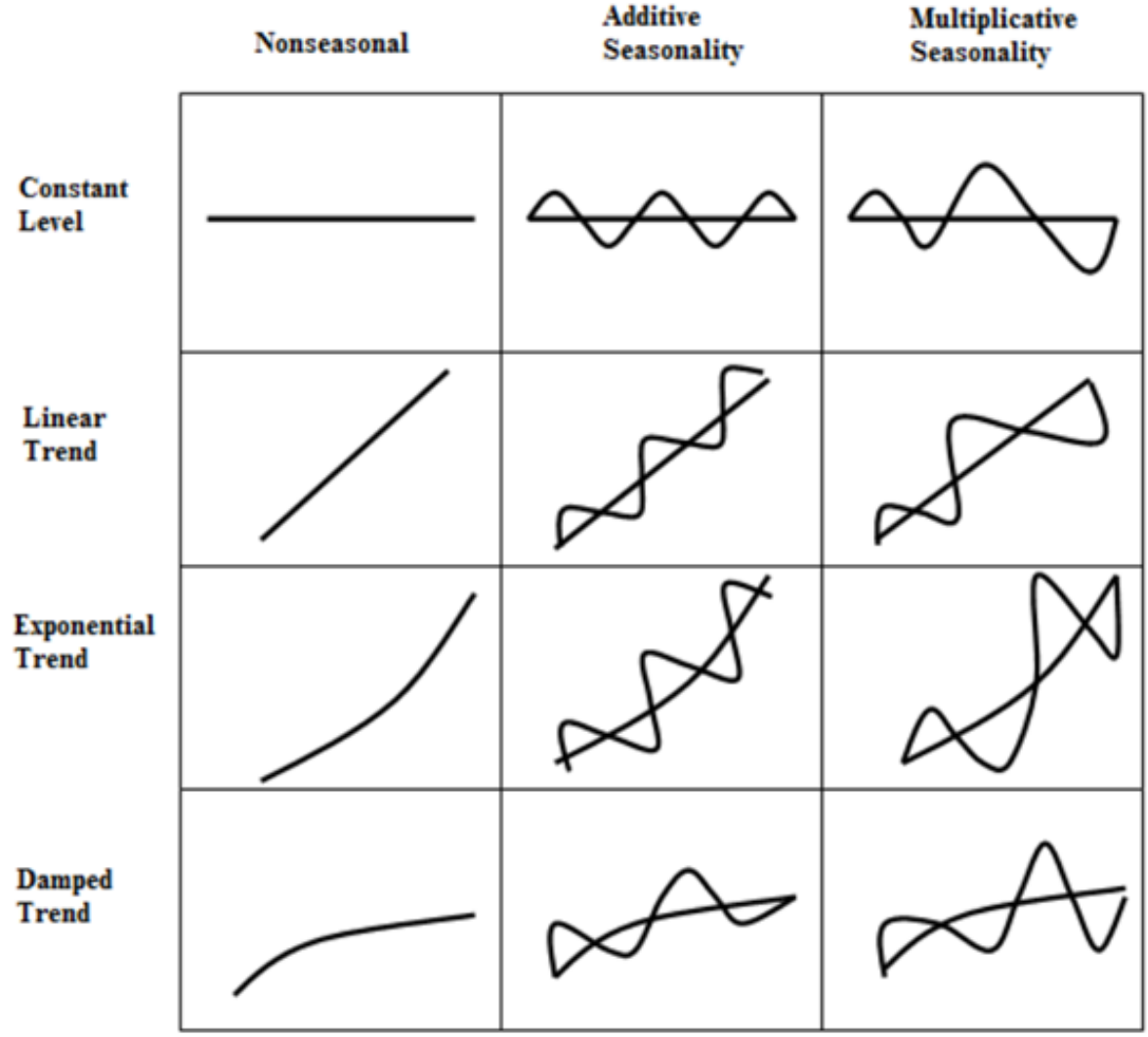
Table 1. Classification of forecasting profiles / forecasting methods by R. Hyndman

Trend component	**Seasonal component**		
	N (None)	**A** (Additive)	**M** (Multiplicative)

N (None)	**N,N**	**N,A**	**N,M**
A (Additive)	**A,N**	**A,A**	**A,M**
Ad (Additive damped)	**Ad,N**	**Ad,A**	**Ad,M**
M (Multiplicative)	**M,N**	**M,A**	**M,M**
Md (Multiplicative damped)	**Md,N**	**Md,A**	**Md,M**

Source: Hyndman *et al.* (2008), p.12

Figure 2. Time series forecast profiles proposed by Gardner (1987)



Source: Gardner, E. S. (Jun.). (1987), pp.174-175

A simple visual comparison of the times series of the volume of tourism receipts for the time period 1998 – 2015 with the Gardner's and with Hyndman *et al.* and Taylor's classification shows out that the very same time series can be associated with a forecasting pattern (forecasting profiles) called the "linear trend, non-seasonal" profile (the "A, N" pattern).

The finding that the time series of the of the volume of tourism receipts for the time period 1998 – 2015 correspond to a single group of forecasting profiles (forecasting patterns) provides a solution to the second part of the above mentioned second problem, the one of selecting and using of suitable forecasting techniques (methods). As both Gardner and

Hyndman *et al.* point out the "linear trend, non-seasonal" profile (the "A, N" pattern) corresponds to the method of the double exponentials smoothing in the presence of linear trend and in the absence of seasonality, known as the Holt method. For comparison reasons, the naïve method, the indexed naïve method, the linear trend forecasting method and the ARIMA method were also added and regarded as forecasting techniques.

Having in mind the above-explained methodological considerations, one can proceed further with the mathematical notation of the Holt method:

- The smoothing of **the level (the base) – "L"**:

(1) $$L_t = \alpha Y_t + (1-\alpha)(L_{t-1} + T_{t-1}) \qquad 0 \leq \alpha \leq 1$$

- The smoothing of **the trend – "T"**:

(2) $$T_t = \beta(L_t - L_{t-1}) + (1-\beta)T_{t-1} \qquad 0 \leq \beta \leq 1$$

- The achieving of **the final forecast "Ft+m"** for **"t+m" periods ahead in the future:**

(3) $$F_{t+m} = L_t + mT_t,$$

Where:

„***α***" and „β" are the smoothing constants for the level and the trend respectfully which could take values between 0 and 1.

Respectfully, the mathematical notation of **the linear trend forecasting method** is as follows:

(4) $$Y(t) = b_0 + b_1(t),$$

Where:

$Y_{(t)}$ is the trend value of the forecasted indicator "as a linear function of time measured in years and in this case the forecast is achieved as Ft=Y(t);

b_0 – the value of the interception (segment) point between the line (the trend line) and the ordinate (the Y-axis) of the coordinate system;

b_1 – the value of the angle coefficient of the line (trend line);

t – time in terms of years.

Using the available regarded the time series and the least squares method, the values for the constant (b_0) and the angle coefficient (b_1) can be further calculated and thus the trend equation (4) can be transformed in a more precise and ready to use manner (Figure 3), as follows:

(5) $$F(t) = Y(t) = - 293815{,}978 + 147{,}492\ (t)$$

Where:

t is time in terms of years.

The **naïve forecasting method** has a formal mathematical notation, as well:

(6) $$F(t+1) = Y(t),$$

Where:
$F(t+1)$ is the forecast value for the future period "$t+1$" and
$Y(t)$ is the last recorded value in the time series.

The mathematical notation of the **indexed naïve method** adds and index value to equation (5) in following manner:

(7) $$F(t+1) = I.Y(t),$$

Where:
$F(t+1)$ is the forecast value for the future period "$t+1$";
$Y(t)$ is the last recorded value in the time series; and
I is the index value of increase of the last recorded value in comparison to the previous one and it is calculate by the following simple formula:

(8) $$I = \left[1 + \left(\frac{Y_{(t)} - Y_{(t-1)}}{Y_{(t-1)}}\right)\right],$$

Where:
Y(t) is the last recorded value in the time series in time period "t";
Y(t-1) is the previous recorded value in time period the time series.

As for the mathematical notation of the **ARIMA** method, the present paper shall provide the simple but clear explanations provided by Prof. Robert F. Nau (2016) and his colleagues from the Fuqua School of Business of the Duke University, NC, as follows:

"A non-seasonal ARIMA model is classified as an "ARIMA (p,d,q)" model, where:

- **p** is the number of autoregressive terms,
- **d** is the number of non-seasonal differences needed for stationarity, and
- **q** is the number of lagged forecast errors in the prediction equation.

The forecasting equation is constructed as follows. First, let y denote the d^{th} difference of Y, which means:

If d=0: $y_t = Y_t$

If d=1: $y_t = Y_t - Y_{t-1}$

If d=2: $y_t = (Y_t - Y_{t-1}) - (Y_{t-1} - Y_{t-2}) = Y_t - 2Y_{t-1} + Y_{t-2}$

Note that the second difference of Y (the d=2 case) is not the difference from 2 periods ago. Rather, it is the *first-difference-of-the-first difference*, which is the discrete analog of a second derivative, i.e., the local acceleration of the series rather than its local trend.

In terms of y, the general forecasting equation is:

(9) $$\hat{y}_t = \mu + \phi_1 y_{t-1} + \ldots + \phi_p y_{t-p} - \theta_1 e_{t-1} - \ldots - \theta_q e_{t-q}$$ ".

And as the present study uses the ARIMA (0,1,0) model, the prediction equation for this model, according to Robert F. Nau, can be written as:

(10) $$\hat{Y}_t - Y_{t-1} = \mu ,$$

or equivalently:

(11) $$\hat{Y}_t = \mu + Y_{t-1}.$$

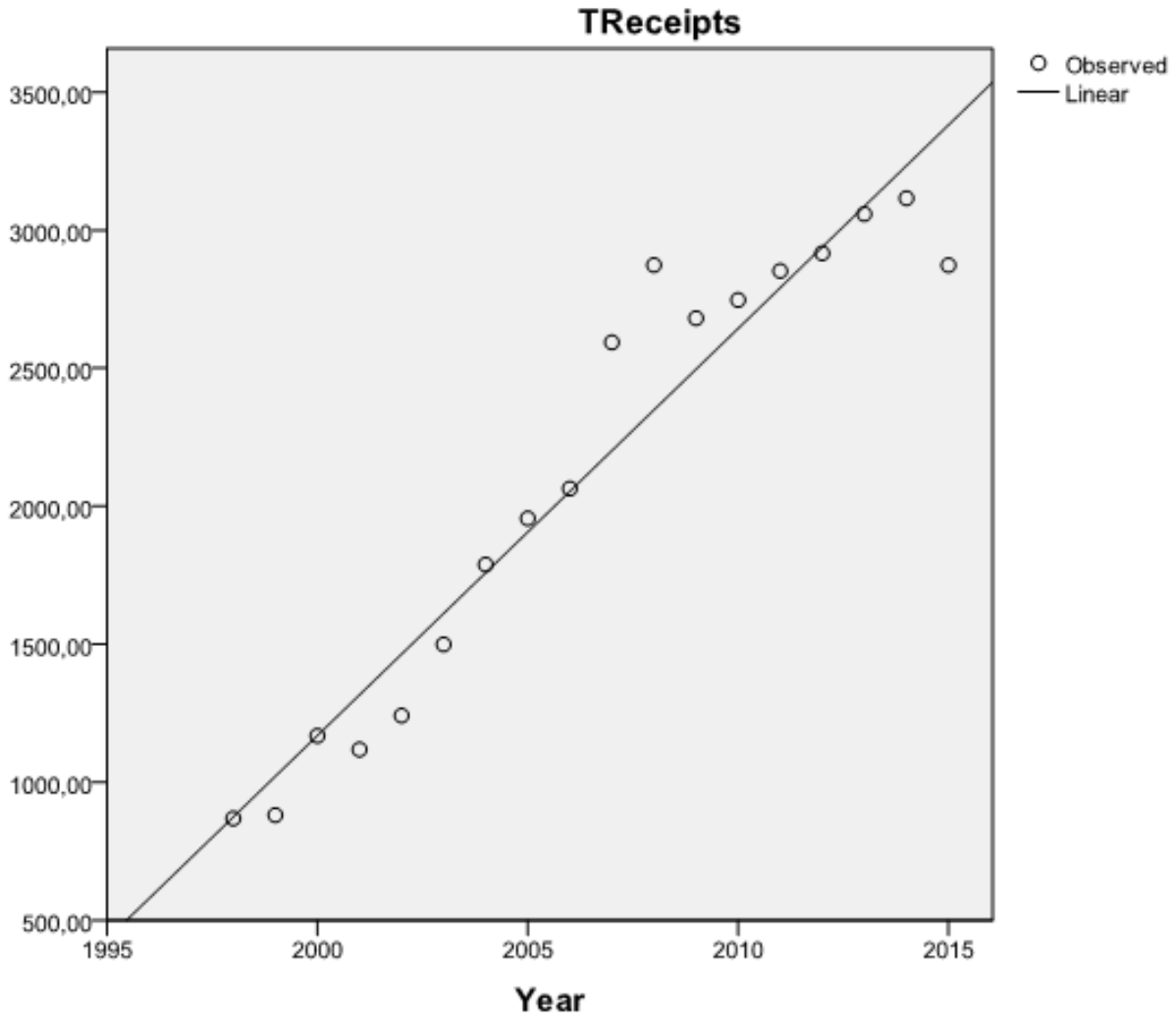
Figure 3. Linear trend estimation for the tourism receipts in Bulgaria achieved through SPSS ® by the use of the least squares method

Model Summary and Parameter Estimates

Dependent Variable:TReceipts

Equation	Model Summary					Parameter Estimates	
	R Square	F	df1	df2	Sig.	Constant	b1
Linear	,923	192,508	1	16	,000	-293815,978	147,492

The independent variable is Year.

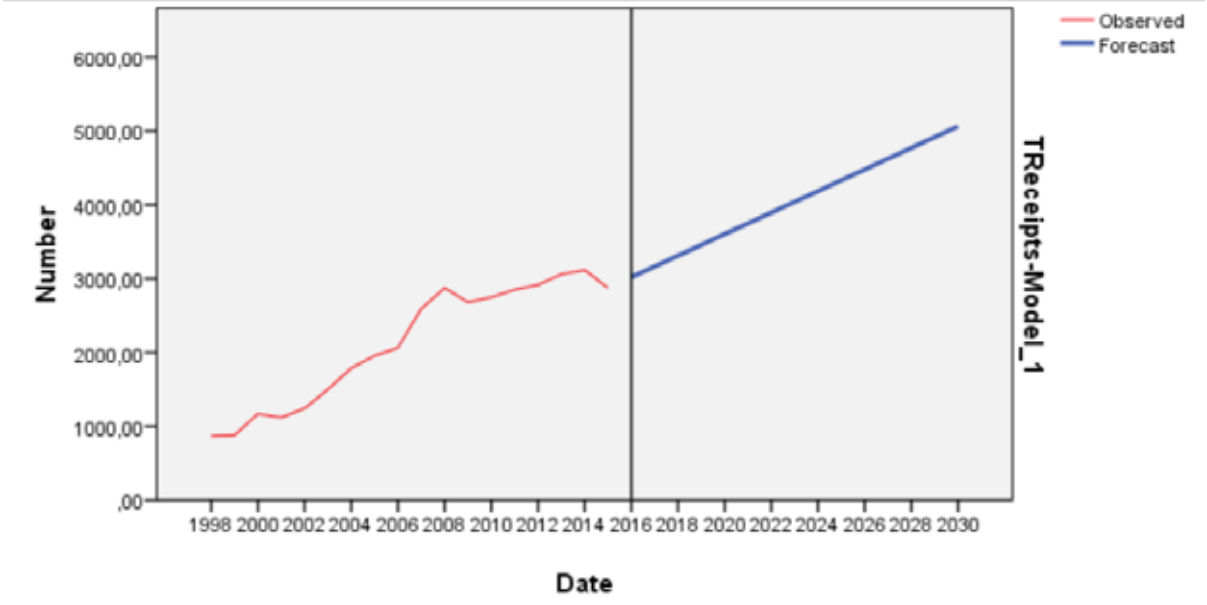


Source: authors' own calculations based on data provided by the Bulgarian Ministry of Tourism and the Bulgarian National Statistical Institute

Figure 4. Plotting of the forecast calculations achieved through SPSS ® by the use of the Holt exponential forecasting method for a linear trend

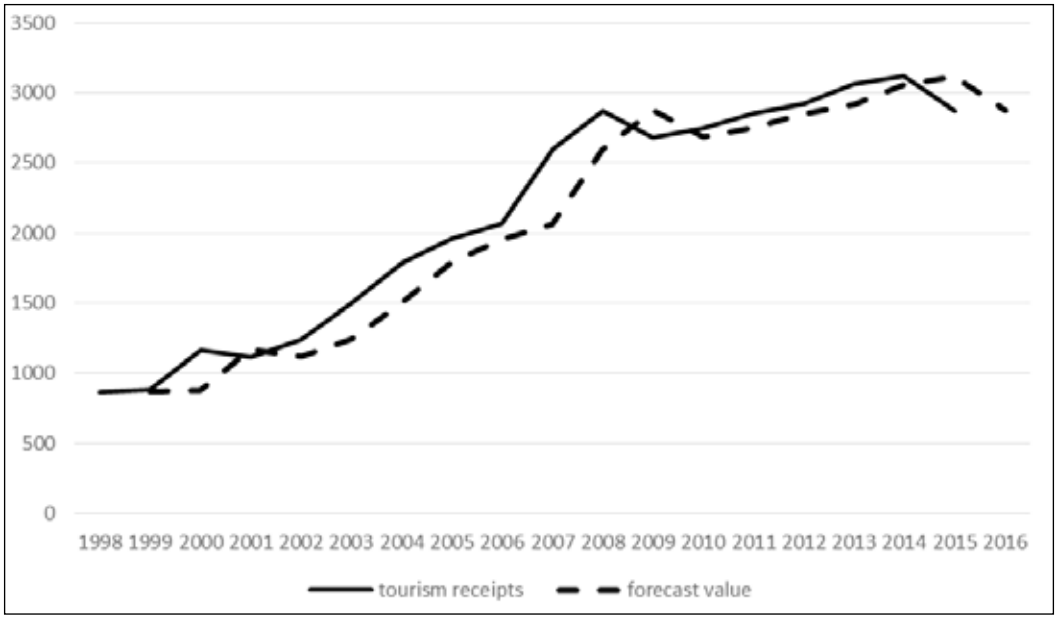
Exponential Smoothing Model Parameters

Model			Estimate	SE	t	Sig.
TReceipts-Model_1	No Transformation	Alpha (Level)	1,000	,290	3,452	,003
		Gamma (Trend)	,001	,076	,017	,987



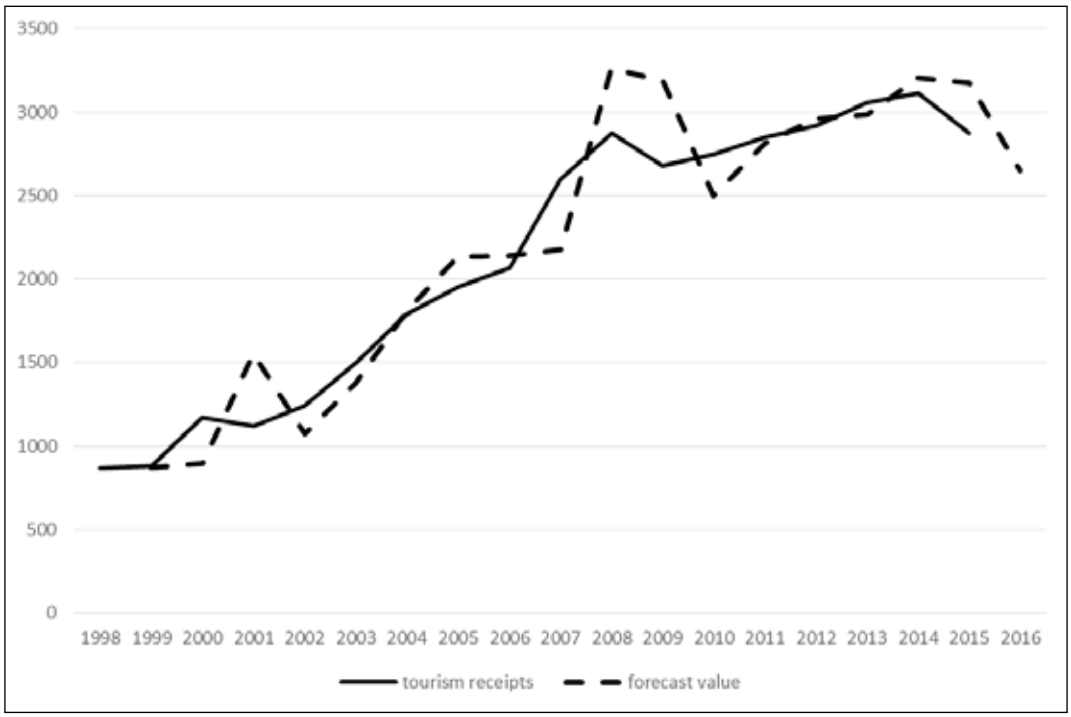
Source: authors' own calculations based on data provided by the Bulgarian Ministry of Tourism and the Bulgarian National Statistical Institute

Figure 5. Plotting of the recorded values and the forecast results by achieved by the use of the naïve method



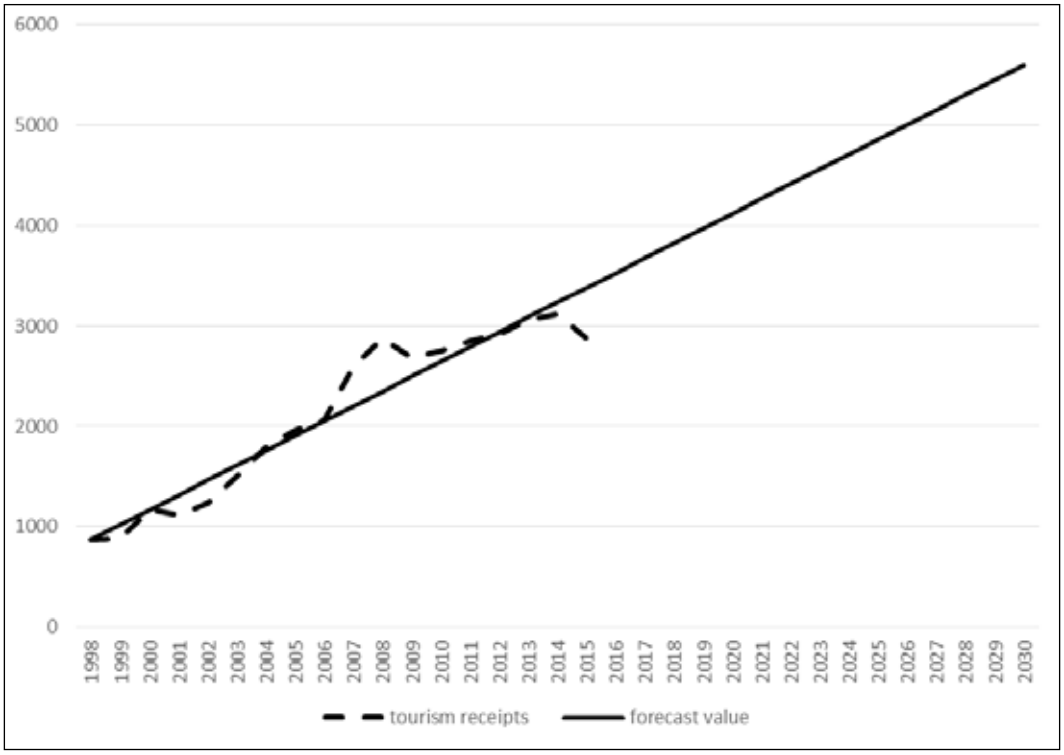
Source: authors' own calculations based on data provided by the Bulgarian Ministry of Tourism and the Bulgarian National Statistical Institute

Figure 6. Plotting of the recorded values and the forecast results by achieved by the use of the indexed naïve method



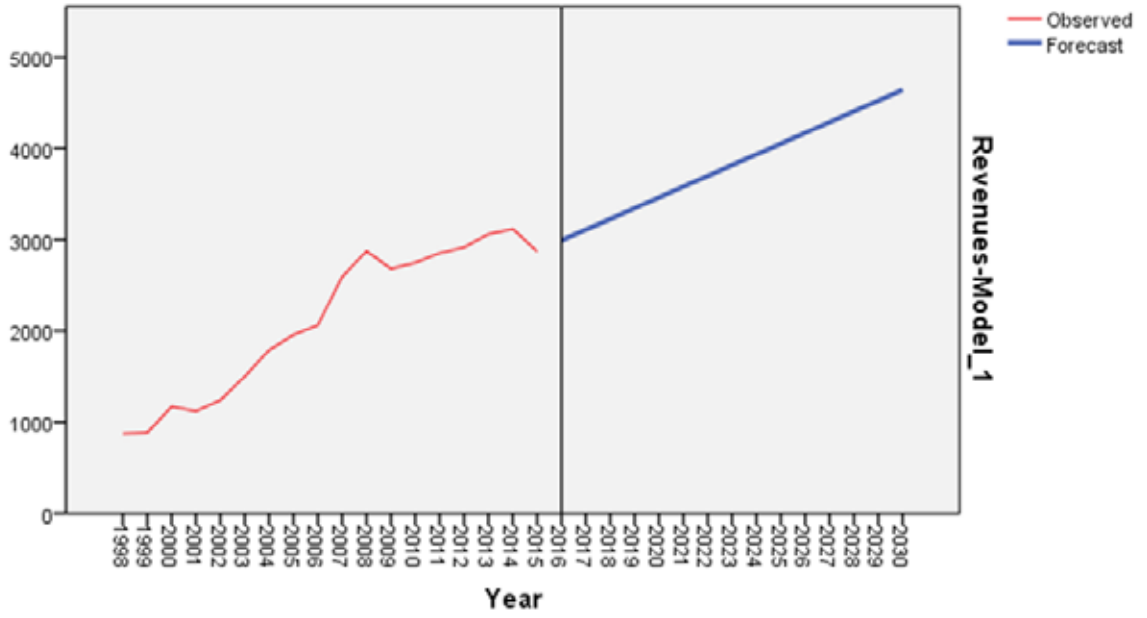
Source: authors' own calculations based on data provided by the Bulgarian Ministry of Tourism and the Bulgarian National Statistical Institute

Figure 7. Plotting of the recorded values and the forecast results by achieved by the use of the liner trend method



Source: authors' own calculations based on data provided by the Bulgarian Ministry of Tourism and the Bulgarian National Statistical Institute

Figure 8. Plotting of the forecast calculations achieved through SPSS ® by the use of ARIMA method, (0,1,0) model



Source: authors' own calculations based on data provided by the Bulgarian Ministry of Tourism and the Bulgarian National Statistical Institute

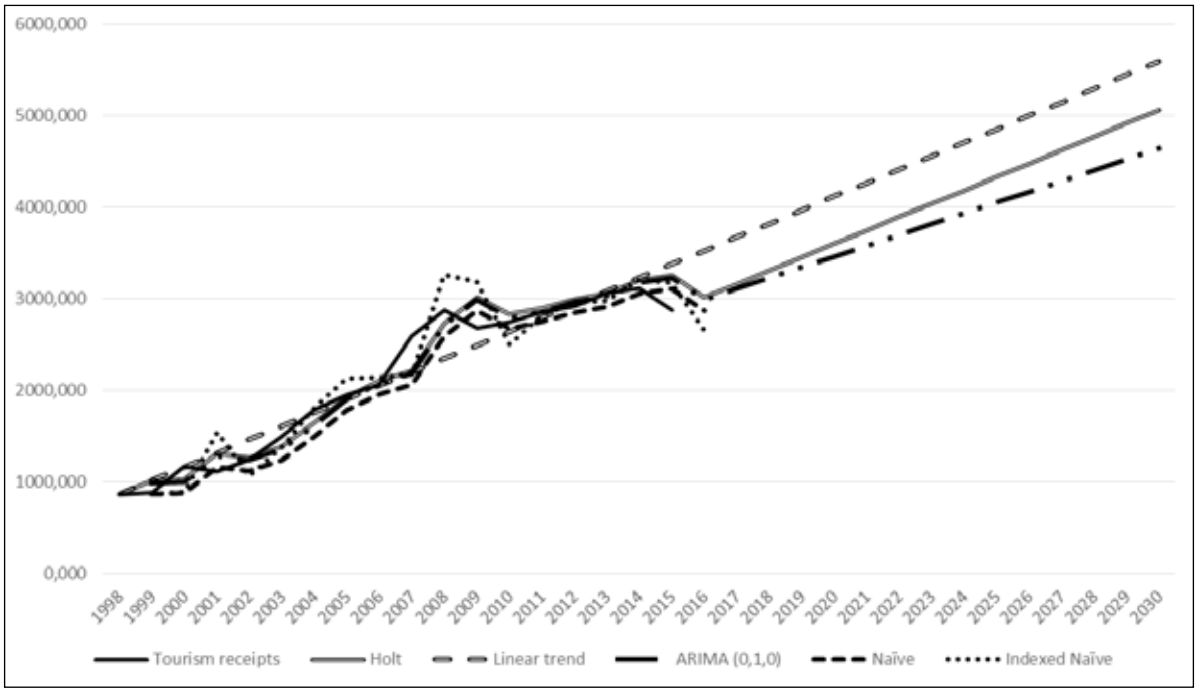
Table 2. The forecasts produced by the four forecasting methods (in million Euros)

Year	Tourism receipts	Holt	Linear trend	ARIMA (0,1,0)	Naïve	Indexed Naïve
1998	868,700	868,700	873,038			
1999	881,000	1015,380	1020,530	987,000	868,700	868,700
2000	1168,400	1027,510	1168,022	999,000	881,000	893,474
2001	1118,600	1315,090	1315,514	1286,000	1168,400	1549,556
2002	1241,500	1265,040	1463,006	1237,000	1118,600	1070,923
2003	1499,500	1387,910	1610,498	1359,000	1241,500	1377,903
2004	1788,600	1646,050	1757,990	1617,000	1499,500	1811,116
2005	1955,700	1935,330	1905,482	1907,000	1788,600	2133,438
2006	2063,800	2102,460	2052,974	2074,000	1955,700	2138,411
2007	2593,800	2210,510	2200,466	2182,000	2063,800	2177,875
2008	2873,800	2740,990	2347,958	2712,000	2593,800	3259,908
2009	2681,200	3021,170	2495,450	2992,000	2873,800	3184,026
2010	2747,100	2828,130	2642,942	2799,000	2681,200	2501,508
2011	2852,400	2893,930	2790,434	2865,000	2747,100	2814,620
2012	2916,600	2999,180	2937,926	2970,000	2852,400	2961,736
2013	3058,400	3063,270	3085,418	3035,000	2916,600	2982,245
2014	3115,700	3205,060	3232,910	3176,000	3058,400	3207,094
2015	2873,000	3262,250	3380,402	3234,000	3115,700	3174,074
2016		3019,050	3527,894	2991,000	2873,000	2649,205

2017		3165,110	3675,386	3109,000		
2018		3311,160	3822,878	3227,000		
2019		3457,210	3970,370	3345,000		
2020		3603,260	4117,862	3463,000		
2021		3749,310	4265,354	3580,000		
2022		3895,370	4412,846	3698,000		
2023		4041,420	4560,338	3816,000		
2024		4187,470	4707,830	3934,000		
2025		4333,520	4855,322	4052,000		
2026		4479,570	5002,814	4170,000		
2027		4625,620	5150,306	4288,000		
2028		4771,680	5297,798	4406,000		
2029		4917,730	5445,290	4524,000		
2030		5063,780	5592,782	4641,000		

Source: authors' own calculations based on data provided by the Bulgarian Ministry of Tourism and the Bulgarian National Statistical Institute

Figure 9. Plotting of the past and future produced by the four forecasting methods



Source: authors' own calculations based on data provided by the Bulgarian Ministry of Tourism and the Bulgarian National Statistical Institute

Table 3 – Error measurement and comparison of the four methods by means of MAPE

Error measurement	Holt	Linear trend	Naïve	Indexed Naïve	ARIMA (0,1,0)
MAPE	6,722	0,078184188	0,08710075	0,103060675	6,844

Source: authors' own calculations based on data provided by the Bulgarian Ministry of Tourism and the Bulgarian National Statistical Institute

5. THE EMPIRICAL COMPONENT: CALCULATING AND COMPARING THE FORECAST RESULTS

In order to provide a solution for the third and the fourth problems set for solving in the following paper, i.e. "(iii) Calculating of short-run and long-run forecasts" (up to year 2030)"; and "(iv) Comparing of the results of the forecast techniques on the basis of the errors in the forecasts", the SPSS 18.0 ® software package was used for calculating the forecasts by the use of the Holt method and the ARIMA method alongside with MS Excel calculation tables for the use of the naïve and the naïve indexed method.

The forecast results from the use of the above-described forecasting methods are presented in Figures 3, 4, 5 and 6 and in Table 2. And Table 3 provides information on the error measurement and comparison of the four methods by means of the indicator "Mean Absolute Percentage of Error" (MAPE). Thus, it becomes clear that the method with the lowest value of MAPE is the linear trend method followed by the naïve and the indexed naïve methods. However, these two methods are not applicable for producing of long-term forecasts. This finding is also visually confirmed by Figure 7 which represents the plotting of the past and future produced by the four forecasting methods.

Based on the results in Table 2 and 3 and Figures from 3 to 9, one can outline three major types of long-term forecasts for the volume of tourism receipts for 2030, as follows:

- **A pessimistic forecast (the forecast with the lowest value)** – calculated by the ARIMA method in random walk model of (0,1,0):

4 641 000 000 Euros tourism receipts;

- **An optimistic forecast (the forecast with highest forecast value and the lowest value of MAPE)** – calculated by the linear trend method, as follows:

5 592 782 000 Euros tourism receipts;

- **A "gray" forecast (with neither optimistic, nor pessimistic forecast value)** – calculated by the Holt method of double exponential smoothing forecasting in the presence of linear trend, with main parameters $\alpha=1.000$ and $\beta=0.001$:

5 063 780 000 Euros tourism receipts.

All these forecasts, as well as the forecasts presented in Table 2 and Figure 7, have one major disadvantage – they are produced for the general indicator "volume of tourism receipts", which means that it refers to the whole of Bulgarian tourism industry and not to the sub-sector of spa and wellness tourism and the part of which belongs to the region of South-West Bulgaria, or the so-called "Yugozapaden" (BG41) region according to the Eurostat Agency NUTS 2 classification of regions. In order to overcome this disadvantage and solve problem (v) "Estimating the size of the spa and wellness tourism in South-West Bulgaria in certain terms, so that the forecast(s) of the above-mentioned general indicator could be particularized especially for regarded sub-sector and region of the country", a certain modification is needed.

One way of doing so is by the use of a weight coefficient, or a set of wait coefficients which shall indicate the share of the foreign visitors with intention to practice spa and wellness tourism in the South-West Bulgaria (the Yugozapaden region). For the needs of the presented hereby study, a set of two coefficient shall be employed: one for indicating the share of the spa and wellness tourism in Bulgaria's overall tourism, and the second is for indicating the share of the tourism in the South-West Bulgaria.

Neither the Bulgarian National Statistical Institute (NSI), nor the Bulgarian Ministry of Tourism, nor any other Bulgarian government institution keeps a regular statistical record of the foreign visitors with spa and wellness tourism aims. The pe is a claim in the "Strategy for Sustainable Development of Tourism in Bulgaria 2014 – 2030" (the Bulgarian official national tourism strategy) (2014) that the share of the spa and wellness tourism is 6.5%, but as no source was indicated for this claim, it may be considered that this figure was taken by random from one of the existing eight consequent surveys on the foreign visitors in Bulgaria. These very same surveys, conducted by three different market research companies in Bulgaria, comprise data for most of the tourism seasons from the winter of 2007 to the spring of 2010. The eight surveys, though based on samples of approximately 3000 foreign citizens visiting Bulgaria, provide information for the percentage shares of the foreign visitors practicing spa and wellness activities in the months of the winter, spring, summer and/or autumn tourism seasons. Based on this information, a model for calculating the Kswt (the coefficient of the share of foreign visitors with spa and wellness aims) can be built (Table 4).

Table 4. Kswt calculation model

Balneo, Spa and Wellness tourism, agregate percentage shares:									
Calculation periods / Tourism subtypes	Year 2007		Year 2008		Year 2009			Year 2010	
	Winter 2007	Summer 2007	Winter 2008	Summer 2008	Winter 2009	Summer 2009	Autumn 2009	Spring 2010	
SPA	n.a.	n.a.	18,50	25,10	n.a.	n.a.	32,00	31,00	Average % share for the observed period - Kswt
Wellness	n.a.	n.a.	6,50	14,30	n.a.	n.a.	n.a.	n.a.	
Balneological tourism	n.a.	n.a.	4,90	4,60	n.a.	n.a.	n.a.	n.a.	
Total:	12,80	30,80	29,90	44,00	26,60	14,60	32,00	31,00	
Annual average:		21,80		36,95			24,40	31,00	28,54

Source: authors' own calculations based on data provided by the Bulgarian Ministry of Tourism and the Bulgarian National Statistical Institute

As for the calculation of the coefficient indicating the share of the tourism in the South-West Bulgaria, a more simplified approach can be applied. The Bulgarian National Statistical Institute keeps data on the receipts received from foreign visitors for their night stays in the separate regions of the country. In this regards, for 2015 the volume of receipts from foreign visitors for night stays in the South-West Bulgaria (the Yugozapaden region) was 125 749 764 BGN (64 294 833.39 Euro), and the volume of the total receipts from foreign visitors' night stays for the whole country was 728 046 828 BGN (or 372 345 332.17 Euro). Thus, just by simple division of this two figures produces **a coefficient of 0.1727 or 17.27%**, which can be considered as **"Kyur" coefficient for share of the tourism in the region of South-West Bulgaria, or the Yougozapaden region**.

The model, presented in Table 4, have of course many weak points. The first consideration in this regard is the fact that the coefficient Kswt is calculated on the assumption that it will remain constant in value throughout all the forecast periods. The only reason for accepting of such a rough assumption is the scarcity of statistical records on which to build a separate model for the development of the coefficient in the course of time. The second week point is that the coefficient Kswt is calculated on the basis of data received from sample surveys,

which on the other hand are conducted by different companies and thus there are: (i) probability errors in the data collected; and (ii) some, though not quite big, differences in the size of the samples and in the methodologies of surveys. The third week point comes in the fact that due to the already mentioned lack of previous data only four consequent years have been used for the calculation of the coefficient Kswt. Despite all these weak points, the model for calculating of Kswt helps to overcome the entire lack of regular statistic data for the ecotourism in Bulgaria.

Having calculated the values of Kswt and Kyur and the data in Table 2 and Figure 7, the forecasts of the volume of the spa and wellness tourism receipts in Bulgaria for 2030 can be easily made. What is necessary is just to multiply the already presented pessimistic, optimistic and "gray" forecasts for the general indicator "volume of tourism receipts" by the decimal value of Kswt, i.e. 0.2854 and the decimal value of Kyur, i.e. 0.1727 respectfully. However, as the optimistic forecast coincides with the forecast with the lowest value of MAPE, the further calculations can be narrowed simply to the optimistic forecast, as follows:

- **The optimistic forecast (the forecast with highest forecast value and the lowest value of MAPE)** – calculated by the linear trend method is multiplied by the decimal value of Kswt, i.e. 0.2854 and the decimal value of Kyur, i.e. 0.1727, as follows:

5 592 782 000 Euros tourism receipts x Kswt x Kyur = 5 592 782 000 x 0.2854 x 0.1727 = 275 660 283.03 Euros.

6. CONCLUSIONS

The presented forecast for the volume of the spa and wellness tourism receipts in the region of South-West Bulgaria, or the so-called Yugozapaden region, suggest that: (i) there is a positive trend of increase in the volume of the tourism receipts in Bulgaria; (ii) by 2030 the value of this indicator for South-West Bulgaria may reach or vary around the value of 275,660,283.03 Euros. This provides ground for a steady positive investment policy by both the private investors and the banking sector in the region. If, however, the assumption of the Bulgarian Ministry of Tourism for the share of 6.5% of the Bulgarian spa and wellness tourism in the overall size of the Bulgarian tourism industry is right, these figures may appear four to five times smaller. Another methodological concern which should be kept in mind is the fact that the forecast horizon of 14 years is reached on calculations based on time series of just 18 years. Nevertheless, there are facts that stand firmly in support of the achieved forecasts, such as: (i) alike all other regions in Bulgaria most of the spa and wellness hotels in region of the South-West Bulgaria have a have on its disposal hot water mineral springs and thus a direct access and use of hot water mineral waters; (ii) the most of the five and four star hotels in the region do poses a spa and wellness section; (ii) the region has one of the biggest international resorts for the use of hot water mineral springs in the country, the town of Sandanski; and (iv) the region successfully combines the ski and spa and spa and wellness tourism market segment so that most of the international winter ski tourists are often the ones who also practice spa and wellness tourism.

REFERENCES

Brown, R. G. (1959). *Statistical Forecasting for Inventory Control*. McGraw-Hill. New York.

Chatfield, C. & Yar, M. (1988). Holt-Winters forecasting: Some practical issues. *The Statistician*. 37: 129-140.

DeLurgio, S. A. (1998). *Forecasting Principles and Applications*. Irwin/McGraw-Hill. Pennsylvania State University.

Dimitrov, P. (2010). Short-run forecasting of tourism arrivals in separate sectors of Bulgarian tourism industry. In: *Proceedings Book - International Scientific Conference "Alternatives for Development of the Modern Tourism.* 378-389.

Dimitrov, P. (2012). Long-term Forecasting of the Spa and Wellness sub sector of the Bulgarian Tourism Industry. *Tourism Management Studies.* 7: 140-148.

Dimitrov, P., Kalinova, M., Gantchev, G. & Nikolov, C. (2015). Exponential forecasting of the monthly volume of the tourism receipts in Bulgaria. *Tourism Management Studies.* 11(1): 104-110.

Filipova, M. (2010). Peculiarities of Project Planning in Tourism. Perspectives of Innovations Economics and Business /PIEB. *International Cross- Industry Research Journal.* 4(1): 57-59.

Gardner, E.S. & McKenzie, E. (1985). Forecasting trends in time series, *Management Science.* 31: 1237-1246.

Gardner, E.S. & McKenzie, E. (1988). Model identification in exponential smoothing, *Journal of the Operational Research Society.* 39: 863-867.

Gardner, E. S. (1985). Exponential Smoothing: the state of the art. *Journal of Forecasting.* 4: 1-28.

Gardner, E. S. (1987). Chapter 11: Smoothing methods for short-term planning and control. In: S. Makridakis and S. C. Wheelright (eds.), *The Handbook of forecasting – A Manager's Guide*, 2nd ed., 174-175. John Wiley & Sons. New York.

Hamilton, J .D. (1994). *Time Series Analysis*. Princeton University Press. Princeton, NJ.

Holt, C. C. (1957). *Forecasting trends and seasonals by exponentially weighted averages*. O.N.R. Memorandum 52/1957. Carnegie Institute of Technology.

Hyndman, R. J., Koehler, A.B., Ord, J.K. & Snyder, R.D. (2008). *Forecasting with Exponential Smoothing – The State Space Approach*. Springer. Berlin.

Hyndman, R. J. (2014). *Initializing the Holt-Winters method. In Hyndsight – A blog by R. J. Hyndeman*. Retrieved June 07, 2016, from: http://robjhyndman.com/hyndsight/hw-initialization/.

Ivanov, M. (2007). *A try and conclusions from the forecasting of the business processes with the help of time series* (a MS PowerPoint presentation in Bulgarian language). Retrieved June 07, 2016, from: http://www.nbu.bg/PUBLIC/IMAGES/File/departments/informatics/Izsledvania/Martin_Ivanov_prolet_2007.pdf.

Juglar, C. (1862). *Des Crises commerciales et leur retour périodique en France, en Angleterre, et aux Etats-Unis*. Guillaumin. Paris. Retrieved from: http://gallica.bnf.fr/ark:/12148/bpt6k1060720

Kitchin J. (1923). *The Review of Economics and Statistics.* 5(1): 10-16. Retrieved June 30, 2013, from: http://www.jstor.org/stable/1927031

NATIONAL STATISTICAL INSTITUTE (2013a). *Statistical Yearbooks of the People's Republic of Bulgaria for the period 1964-1989.* Retrieved June 15, 2013, from: http://www.nsi.bg

NATIONAL STATISTICAL INSTITUTE (2013b). *Statistical Yearbooks of the Republic of Bulgaria for the period 1990-1999.* Retrieved June 15, 2013, from: http://www.nsi.bg

Nau, R. (2016). *Introduction to ARIMA: nonseasonal models*. Retrieved March 21, 2016, from: http://people.duke.edu/~rnau/411arim.htm

NOEMA Global Dynamics (2008). *A Survey on the tourists in Bulgaria, Summer 2008.* Sofia, Bulgaria: The State Tourism Agency of the Republic of Bulgaria (at present part of the Ministry of Tourism).

Ledolter, J. & Abraham, B. (1984). Some comments on the initialization of exponential smoothing. *Journal of Forecasting*. 3: 79-84.

MINISTRY OF ECONOMY, ENERGY AND TOURISM (2011). *Surveys and Analyses 2010. The foreign and the Bulgarian Tourists in Bulgaria – General Observations and Attitudes*. Retrieved June 29, 2012, from: http://www.mi.government.bg/files/useruploads/files/turism_-_statistika_i_analizi/prouchvania_proekti/prouchvane_chujdenci_bulgarians_20092010_obshtinabljudenia.pdf

MINISTRY OF TOURISM (2014). *Strategy for Sustainable Development of Tourism in Bulgaria 2014 – 2030*. Retrieved March 21, 2016, from: http://www.tourism.government.bg/sites/tourism.government.bg/files/uploads/strategy-policy/strategy_2014-2030_13_05_2014-sled_ms_26_05_2014.pdf

Mishev, G. & Goev, V. (2012). *Statistical Analysis of Time Series*. Avangard-Prima Publishing House. Sofia, Bulgaria.

Pegles, C. C. (1969). Exponential forecasting: some new variations. *Management Science.* 15(5): 311-315.

Sirakov, S. (1996). *Conjuncture and Forecasting of International Markets.* Stoilov Publishing House. Sofia, Bulgaria.

Stankova, M. (2010). The Tourism Regions in Bulgaria - Concepts and Challenge. *Journal of Tourism & Hospitality Management*. 16(1): 109-118.

Taylor, J. W. (2003). Exponential Smoothing with a damped multiplicative trend. *International Journal of Forecasting.* 19: 715-725.

Tashman, L. J. & Kruk, J. M. (1996). The use of protocols to select exponential smoothing procedures: a reconsideration of forecasting competitions. *International Journal of Forecasting.* 12: 235-253.

Tsay, R. S. (2005). *Analysis of Financial Time Series*. John Wiley & Sons. New York.

Williams, D. W. & Miller, D. (1999). Level-adjusted exponential smoothing for modeling planned discontinuities. *International Journal of Forecasting.* 15: 273-289.