

REVIEW

for the acquisition of the educational and scientific degree "Doctor" in scientific specialty „Statistics and demography”

Reviewer: Assoc. prof. Margarita Stefanova Shopova, PhD, scientific specialty „Statistics and demography”, “D. A. Tsenov” Academy of Economics – Svishtov.

Author of the dissertation: Plamena Yordanova Koleva, PhD candidate in doctoral program „Statistics and demography”, Department of Statistics and Applied Mathematics, “D. A. Tsenov” Academy of Economics – Svishtov.

Title of the dissertation: "Statistical study of tourism in Bulgaria"

Grounds for writing the review: Order №126/11.02.2025 of the Rector of “D. A. Tsenov” Academy of Economics – Svishtov, the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for the implementation of ZRASRB in “D. A. Tsenov” Academy of Economics – Svishtov, and the decision from the meeting of the scientific jury held on 14.02.2025.

I. General presentation of the dissertation

In terms of format and volume, the submitted dissertation complies with the requirements of Article 27, Paragraph 2 of the Regulations for the implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria. The dissertation comprises a Title page (1 page), Table of contents (2 pages), Abbreviations and acronyms (2 pages), Introduction (9 pages), Exposition in three chapters (141 pages); Conclusion – summary of the obtained results (7 pages); Declaration of originality (1 page); Bibliography (16 pages), Appendices (25 pages). The total volume of the dissertation is 204 pages. The author’s theses and analyses are supported in the main text with 13 tables and 31 figures. The reference list contains 154 titles, of which 84 in Cyrillic and 49 in Latin are scientific publications, 3 in Cyrillic and 8 in Latin are methodological documents, 3 in Cyrillic and 8 in Latin are normative documents. In 22

appendices in tabular form, the data used for the conducted statistical analysis (18 appendices) and the obtained results (4 appendices) are presented.

II. Assessment of the dissertation format and content

In today's global world, tourism occupies an important place in the economies of countries and has a strong impact on their upward development. The problems of the sector are constantly in the focus of programme documents, various forums and discussions related to the long-term development of Bulgaria. Although topics related to tourism are the subject of a number of scientific publications, it is rare to find studies based on statistical and econometric approaches. Their use is a prerequisite for conducting a thorough analysis of empirical data and obtaining objective conclusions. The necessity of applying appropriate statistical-econometric methods in the analysis of the ongoing processes in tourism determines the relevance of the research.

In the **introduction** of the dissertation the object and subject of the research are correctly defined, the aim is clearly formulated. The **object** of the research is the visits of foreign tourists to the Republic of Bulgaria, and the **subject** of the research - the state and patterns in their dynamics and structure. The **aim** of the dissertation is to study the state, dynamics, seasonality and structural changes of inbound tourism in Bulgaria for the period from 2008 to 2024.

The formulated five **tasks** of the research correspond to the content of the dissertation. The **research thesis** that "through the application of appropriate statistical and econometric methods for the study of the dynamics, seasonality and structural changes in terms of indicators of inbound tourism can be established objectively formed patterns that allow to correctly model the trend and to develop short-term forecasts for the assessment of future development of key indicators of inbound tourism" is proven based on the results of the analysis. The **information base** of the study is formed by official documentary sources and statistical data. The **research methods** used are indicated – both universal scientific and specific statistical methods. The **research constraints** accurately outline the scope of the study, its time limits are well justified.

Chapter One is *theoretical* in nature and forms the basis for the study of the problem in the following chapters. In the **first paragraph**, a retrospective analysis of

tourism statistical research at the global and European level is carried out. The emergence and development of tourism statistics, the development of basic concepts and definitions and the creation of tourism economic accounts are examined. The *second and third paragraphs* present the methodological guidelines developed by the United Nations World Tourism Organisation and the European Union, respectively, which are the basis for conducting tourism statistics research. The documents are listed in chronological order, the main purpose of each is emphasised and the content of their main structural parts is discussed. The *fourth paragraph* can be seen as the theoretical basis of the study. It includes the main definitions used in tourism statistics, a classification of tourist trips by forms and categories of tourism is made. The review of empirical studies of tourism in Bulgaria, carried out in the *fifth paragraph*, shows a good knowledge of the scientific works, the results obtained in them, as well as understudied problem areas, among which is the application of statistical-econometric and mathematical methods and models for deriving dependencies and analysis of empirical results.

The **second chapter** is *methodological*. It presents the information base of the study and various statistical methods for analysing tourism related data. The *first paragraph* presents the surveys conducted by the National Statistical Institute, which are the source of the data for the statistical study of tourism in Bulgaria. For each of them the main objective, the object of observation, the indicators for which the data are collected are indicated. Furthermore, the choice is justified and the indicators for characterising inbound tourism are listed, the empirical analysis of which is carried out in the third chapter of the doctoral thesis. In the *second paragraph*, the stages of time series modeling and forecasting are discussed and the relevant formulas are presented. Since tourism processes are seasonal in nature and data with a periodicity of one or three months are available, the discussion of statistical and econometric methods for seasonality analysis in the *third paragraph* is quite relevant. After presenting the problems inherent in the application of the classical method, methods based on decomposing the time series into components in order to determine the individual impact of each are discussed. The strengths and weaknesses of these methods are analysed and the choice of some of them to perform the empirical analysis is justified in

the third chapter . The statistical approach to the study and assessment of structural dynamics in tourism is presented in the *fourth paragraph*. Individual and summary measures of structural change are discussed, as are criteria for preferring one or the other in a particular study.

The **third chapter** is empirical in nature. The *first paragraph* presents Bulgaria's position among a selected group of countries in terms of various indicators characterizing international tourism. A descriptive comparative analysis of the dynamics of six indicators is carried out for the period 1995-2019, four of which are related to the financial contribution of tourism to the economy of the respective country. In the remaining paragraphs, based on official statistics, a statistical analysis of inbound tourism in Bulgaria is carried out by means of time series analysis. The indicator used is that of tourist arrivals in Bulgaria. It has been analysed according to two attributes: motives of travel in 4 groups and nationality of visitors in 4 groups. In the *second paragraph*, the dynamics of the indicator is examined. Plots of the examined time series are used for visual inspection of the presence of a trend. Strictly following the time series modeling procedure, five types of models were tested: first, second and third degree polynomial, hyperbola and semi-logarithmic function. The most appropriate models characterizing the trend of the investigated time series were derived and used for the development of short-term forecasts for a 3-year period under pessimistic and optimistic scenarios. In the *third paragraph*, the seasonal fluctuations of inbound tourist arrivals in Bulgaria are investigated using monthly data using the X13 ARIMA-SEATS and TRAMO/SEATS methods. For each attribute, the trend components, random deviations and seasonally adjusted values for the indicator obtained with the two methods are presented. Monthly forecasts are developed with a 3-year horizon using the X13 ARIMA-SEATS method and with a 2-year horizon using the TRAMO/SEATS method. In the *fourth paragraph*, an analysis of changes in the structures of visits of foreign tourists formed by the the visitors' nationality is carried out. Each of these is examined both overall and according to the different motivations of the visits. The intensity of the structural changes is assessed by the integral coefficient.

The main results of the research carried out in the thesis are summarized in the **conclusion**.

In the dissertation a topical problem is investigated, the solution of which needs an objective analysis with the use of accurate methods, such as statistical-econometric methods. The thesis is of sufficient length, has a clear structure and follows the logic of a complex scientific study. There is a balance in the size of the individual chapters. The exposition is built in a logical sequence that allows to develop the research ideas, to prove the author's hypotheses and to achieve the relevant contributions. The number of cited literature sources, the balance between Bulgarian and foreign publications and the good structuring of the literature review show a thorough knowledge of contemporary scientific developments on the topic. The diagrams and tables used are in sufficient quantity and adequately illustrate the exposition and important conclusions. They are compiled according to the rules in statistical theory. The formulated conclusions at the end of each chapter reinforce the impression of a clear thought and plan for carrying out the research and are seen as a transition to the next exposition. The presentation of the baseline data and intermediate results in the appendices lightens the perception of the main text and the results of the analysis. The expression of the author's opinion is clear, without falling into unnecessary criticism. Scientific ethics have been respected, literature sources have been cited correctly. A scientific style has been used in the presentation and a very good linguistic culture has been shown.

A total of 4 papers have been published on the topic of the dissertation in non-peer-reviewed journals and in peer-reviewed proceedings, including 2 independent papers and 2 papers co-authored with the supervisor. These publications have been presented by the PhD student in 4 scientific forums, which is a reason to assume that the results of the research have been popularized. The PhD student's participation in three public lectures and one round table contributed to their competence and awareness. 30 publication points were recorded. Together with the dissertation, the minimum national requirements according to Article 2b of the Law on the Development of Academic Staff in the Republic of Bulgaria have been fulfilled.

The author's summary is 34 pages long. Structurally, it contains the necessary elements. Its content accurately and fully reflects the dissertation work and the main contributions of the author.

III. Scientific and scientific-applied contributions of the dissertation

The dissertation submitted for review is of a theoretical-applied nature. The contributions correctly elaborated by the PhD candidate can be divided into two groups.

1. Theoretical-methodological contributions:

- A systematic critical review of the scientific publications related to different aspects of tourism in Bulgaria has been carried out, as a result of which the use of statistical and econometric approaches in the analysis of tourism processes has been highlighted as an underdeveloped problem area in research;
- The institutional regulation and methodological provision of tourism statistics, carried out at the global and European level, have been studied; the stages in their development have been traced; the need to harmonize tourism monitoring in Bulgaria with the rules applied by the UN World Tourism Organization, OECD and Eurostat has been highlighted.

2. Practical-applied contributions:

- Bulgaria's place on the international tourism market is determined as a result of a comparative analysis with 4 neighbouring European countries in terms of inbound tourism indicators and by assessing the contribution of tourism to the gross domestic product of the respective country;
- Through the application of statistical and econometric methods, patterns in the dynamics, seasonality and structural changes of foreign tourist arrivals by major country groups and by motives of the visits have been identified, and trend models have been built to reflect the impact of the 2008 global crisis and the impact of the Covid-19 pandemic on inbound tourism in Bulgaria;
- Using trend and seasonality models, and applying optimistic and pessimistic scenarios, short-term forecasts of the state of inbound tourism in Bulgaria are developed.

It is my opinion that the contributions thus formulated represent an enrichment to a certain extent of the theory and practice on the thesis topic.

IV. Critical notes, questions, and recommendations on the dissertation

In accordance with the aim and objectives of the research, I do not find any shortcomings in the dissertation submitted for review. I would like to make the

following comment on the presentation: the listing of the breakdown of all indicators in paragraph 2.1 limits the overall perception that the indicator under study is "Visits of foreign tourists to Bulgaria", and the statistical analysis is carried out on complex groupings on the attributes "Motives for visit" and "Nationality of visitors".

My question is related to the obtained trend models in section 3.2: Since time (the temporal variable) has so little influence on the dynamics of the respective indicator, what other factors, according to the author, would have an influence?

I would recommend that the PhD student focus on publishing the results of their research on demographic processes in specialized scientific journals indexed in the world databases Scopus and Web of Science.

The comments and recommendations made do not diminish the value of the submitted dissertation and would be useful for future research of the PhD student.

V. Overall conclusion and opinion

The reviewed dissertation entitled "Statistical Study of Tourism in Bulgaria", developed by PhD student Plamena Yordanova Koleva, represents a comprehensive and complete independent scientific research of a theoretical-applied nature. I believe that the set aim and tasks have been achieved, and the obtained results allow for the corresponding scientific and applied contributions to be drawn.

Conclusion. I express a positive assessment of the dissertation and *recommend* to the esteemed members of the scientific jury to vote "in favour" *of awarding Plamena Yordanova Koleva the educational and scientific degree of "Doctor"* in the field of higher education 3 Social, economic, and legal sciences, professional direction 3.8 "Economics", scientific specialty "Statistics and demography".

Date: 11.03.2025,
Svishtov

Reviewer: 
(Assoc. prof. Margarita Shopova, PhD)