D. A. TSENOV ACADEMY OF ECONOMICS – SVISHTOV

DEPARTMENT OF STATISTICS AND APPLIED MATHEMATICS

Plamena Yordanova Koleva

STATISTICAL STUDY OF TOURISM IN BULGARIA

AUTHOR'S SUMMARY

Dissertation for the award of the educational and scientific degree
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"Statistics and Demography"

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Assoc. Prof. Plamen Petkov, PhD

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The dissertation is 204 pages long, of which 162 are the main text. Structurally, it includes Abbreviations and Acronyms, an Introduction, an Exposition in three chapters, a Conclusion, a List of references – 154 sources (90 in Cyrillic and 64 in Latin), 22 Appendices and a Declaration of originality. The main text includes 32 figures and 13 tables.

The final meeting of the scientific jury for the defense of the dissertation will be held on April 25, 2024 at 11:00 a.m. in the Conference Hall of the Rectorate of the "D. A. Tsenov" Academy of Economics - Svishtov.

The materials for the defense are available to those interested in the "Doctoral Studies and Academic Development" Office of the "D. A. Tsenov" Academy of Economics - Svishtov.

I. GENERAL CHARACTERISTICS OF THE DISSERTATION

1. Relevance of the topic

Tourism is an industry of great importance for the development of any national or world economy. From a statistical point of view, it can be presented as an activity of travelers to a given destination outside their usual environment for a period of less than a year. One of the most significant and long-term trends accompanying the formation and development of the world economy is the constantly growing influence of tourism both in a global perspective and on the economies of individual countries and regions. Tourism is becoming an independent sphere of any national economy, the main activity of which is related to satisfying specific needs of the population.

The relevance of the study is determined by the fact that for a qualitative empirical analysis of tourism data and the establishment of scientifically based regularities, it is necessary to use appropriate statistical and econometric methods and models, and the results obtained and the generated conclusions and conclusions can serve in the development of strategic decisions for the development of the industry.It is also necessary to conduct a comprehensive study of the effects of the Global Crisis and the COVID-19 pandemic on Bulgarian tourism and in particular on visits of foreign tourists to Bulgaria. In parallel, it is useful to track and assess with appropriate tools the seasonality of tourist trips to Bulgaria. This requires the application of an integrated approach, in which it is necessary to lay the foundation on the use of modern statistical methods and techniques for collecting, processing and analyzing official data sets. All this determines the importance of the scientific topic, its purpose, tasks and structure of the dissertation from a theoretical-methodological and practical-applied point of view.

2. Object and subject of the study

The object of the study is the visits of foreign tourists to the Republic of Bulgaria.

The subject of the study is the status and patterns in the dynamics and structure of visits by foreign tourists.

3. Purpose and objectives of the study

The aim of the dissertation is to study the status, dynamics, seasonality and structural changes of inbound tourism in Bulgaria for the period from 2008 to 2024. The present work is of a theoretical, methodological and applied nature. The

theoretical aspects are associated with tracing the chronology in the legislative and regulatory regulation of tourism statistics at the global, European and national levels. From a methodological point of view, the main information sources and indicators that characterize incoming tourist flows are presented, as well as statistical and econometric methods and models suitable for analyzing dynamics, characterizing seasonal fluctuations, and measuring structural changes. The applied aspect is associated with the application of the considered statistical and econometric methods and models for assessing the status, dynamics, seasonality and structural differences that have occurred with regard to inbound tourism.

Achieving the goal is associated with the implementation of the following specific research **tasks**:

- retrospective presentation of global and European experience in organizing tourism statistics;
- presentation of methodological guides and sources of information for statistical research on tourism;
- performing a comparative analysis of international tourism in Bulgaria and a group of European countries by key indicators;
- monitoring the status, dynamics, seasonality and structural differences in foreign tourist visits;
- developing short-term forecasts of foreign tourist visits using selected models characterizing the development trend and seasonal fluctuations.

4. Research thesis

The research thesis of the dissertation is that through the application of appropriate statistical and econometric methods for studying the dynamics, seasonality and structural changes in terms of inbound tourism indicators, objectively formed regularities can be established, which allow the development trend to be correctly modeled and short-term forecasts to be developed for assessing the future development of key inbound tourism indicators.

5. Information provision

To conduct the study, official information from the National Statistical Institute, the World Travel and Tourism Council and the World Tourism Organization was used, as well as scientific publications - monographs, articles and studies in the specialized literature on the topic of the dissertation. Program, strategic and methodological documents regulating the normative functioning of tourism statistics in Bulgaria, in the countries of the European Union and in a global perspective were studied.

6. Research methodology

To outline the problems of inbound tourism in Bulgaria, statistical data have been analyzed both at the European and global levels, as well as at the national level, a number of statistical and econometric analyses have been applied through computer data processing, time series analysis and forecasting techniques have been applied, as well as graphical and tabular methods for data presentation. For the calculations related to the application of statistical and econometric methods, the software products MS Excel and Gretl have been used.

7. Research constraints

The dissertation focuses on the problems that are directly related to the above-mentioned goals and objectives. The emphasis is on inbound tourism due to Bulgaria's strong position in the international tourism market according to the indicator "relative share of GDP of inbound tourism revenues". The scope of the study does not include trips of Bulgarian citizens abroad (outbound tourism), trips of Bulgarian citizens in Bulgaria (domestic tourism), accommodation, tourism expenditures and final consumption expenditures of tourists, residents and non-residents of the country.

The time scope of the study in a dynamic aspect focuses on the period from 2008 to 2024, using annual and monthly data on foreign visits to Bulgaria. The choice is predetermined by the information available in the Infostat system of the National Statistical Institute, which is conditioned by the fact that in the harmonization of tourism research with global standards, the NSI uses 2008 as the base year.

The author expresses his gratitude to the scientific supervisor for the support provided in writing the dissertation, to the colleagues from the Department of Mathematics and Statistics for the suggestions, critical remarks and consultations, and to the D. A. Tsenov Academician for the technical assistance and the training opportunity provided.

II. STRUCTURE AND CONTENT OF THE DISSERTATION

The dissertation is 204 pages long, of which 162 are the main text. Structurally, it includes abbreviations and acronyms, an introduction, an exposition in three chapters, a conclusion, a list of references – 154 sources (90 in Cyrillic and 64 in Latin), 22 appendices and a declaration of originality. The main text includes 32 figures and 13 tables.

The structure of the dissertation is as follows:

Abbreviations and acronyms used

Introduction

CHAPTER ONE. Tourism as an object of statistical research

1.1. Analysis of European and global experience in organizing statistical tourism surveys

1.2. Methodological guides in the field of tourism statistics, developed by the United Nations World Tourism Organization

1.3. Methodological guides in the field of tourism statistics in the European Union countries

1.4. Conceptual foundations of tourism statistical research

1.5. Tourism in Bulgaria - an overview of contemporary empirical research

CHAPTER TWO. Informational and methodological aspects of tourism research

2.1. Information provision for the statistical survey of tourism in Bulgaria

2.2. Methods and models for studying the dynamics of processes in tourism

2.3. Statistical methods for characterizing seasonality in tourism processes

2.4. Statistical methods for measuring and assessing the intensity of structural changes in tourism

CHAPTER THREE. Statistical analysis of foreign visits to Bulgaria

3.1. Comparative analysis of international tourism in Bulgaria and a group of European countries

3.2. Statistical analysis of the dynamics of incoming tourist visits

3.3. Statistical analysis of seasonal fluctuations in incoming tourist visits

3.4. Statistical analysis of structural changes in incoming tourist visits

Conclusion

Declaration of originality

References

Applications

III. SHORT SUMMARY OF THE DISSERTATION THESIS

INTRODUCTION

The introduction of the dissertation work justifies the relevance of the problem and the motives for its research. The object and subject of the research are determined and the scientific goal and the main tasks arising from it are defined. The structure and research thesis of the dissertation work are outlined and the limiting conditions are described, indicating the main information sources relied on in the research.

CHAPTER ONE
TOURISM AS AN OBJECT OF STATISTICAL RESEARCH

This chapter traces in chronological terms the European and global experience in organizing the statistical survey of tourism, presents the methodological guidelines for organizing tourism statistics in a global and European aspect, and examines the basic concepts that have become established in statistical practice. In order to provide an appropriate basis for the empirical analysis of inbound tourism in Bulgaria, a review of contemporary empirical research is made.

In **paragraph 1.1** The emergence of tourism statistics is examined in a retrospective aspect, presenting the stages in the creation of official tourism statistics. The emergence of tourism statistics in 1852 is associated with Switzerland, and at the end of the 19th century, the first statistical observation in tourism was conducted in Austria (Alexandrova, Soboleva, Tsapuk, & Novikov, 2014, p. 20). At the beginning of the 20th century, Austrian scientists led by Engelmann also conducted the first targeted studies on tourism topics, in which statistical analysis based on statistical information on tourism prevailed. Regular reporting of tourist flows in European countries began in the late 1920s. During this stage, tourism research focused entirely on foreign tourists, and domestic tourism was completely ignored.

The industrial revolution also gave rise to the need for recreational tourism and tourism related to rest and recovery of vital forces. However, the analysis of tourism still lacks both a unified system for organizing and monitoring tourism and a regulated methodology for collecting and processing statistical information, which also causes the insufficient completeness and accuracy of the results obtained, as well as incomparability between the units, objects and time of the observations conducted.

Interest in tourism in terms of developing concepts and definitions arose somewhat later in the 20th century (UN, UNWTO, 2010). The beginning was given in 1937, when the Council of the League of Nations proposed the use of a definition of "international tourist" for statistical purposes. Later in 1950, the International Union of Official Tourism Organizations (IUOTO) adopted minor corrections to the definition. Finally, in 1953, the United Nations Statistical Commission defined the concept of

“international visitor”. In 1963, in Rome, the United Nations Conference on International Travel and Tourism recommended the use of definitions of the terms “visitor”, “tourist” and “excursionist”. These definitions were approved by the United Nations Statistical Commission in 1976.

In the 1980s, the importance of tourism and its interdependence with other economic and social activities increased. The United Nations World Tourism Organization (UNWTO or now UN Tourism), in close cooperation with the United Nations Statistical Division, initiated a process to revise the definitions and classifications used in tourism statistics, resulting in two main directions. In the **first direction**, modifications are made to the definitions and classifications used in tourism research in order to achieve harmonization and comparability with those of other national and international statistical systems. The **second direction** is directly related to the development of an algorithm for the inclusion of tourism in the analytical framework of national accounts. The International Conference on Travel and Tourism Statistics held in Ottawa in June 1991 discussed the experience of Canada and France in this area and discussed the Manual on Economic Accounts of Tourism, developed by the Organization for Economic Co-operation and Development (OECD). Adapted statistical definitions for domestic and international tourism are proposed and a new classification of tourism activities is adopted, linked to other international statistical standards and recommendations such as the balance of payments, the System of National Accounts 1993 and the Recommendations on Statistics of International Migration. In 1993, the Recommendations on Tourism Statistics, adopted by the Commission and published in 1994, constitute the first international official document defining the foundations of a system of tourism statistics in terms of concepts, definitions, classifications and indicators.

Similar initiatives are also being implemented in other world and European organizations. In the 1980s, the OECD launched activities to establish links with the analytical framework of national accounts, and in 1991 it moved on to collecting and analyzing data among the organization's member countries and implementing a policy for economic accounts in tourism. In 1997, the OECD Tourism Committee also implemented the first proposal for a tourism satellite account for OECD countries. Eurostat develops programs and conducts a number of studies in the field of tourism statistics in the European Union. In 1995, a directive of the Council of the European Union was adopted, related to the collection of statistical information in the field of tourism, which aims to harmonize and improve the statistical data prepared by the Member States. This is also the first legal step towards the creation of an integrated information system for tourism demand and supply. In 2001 The Tourism Satellite Accounts (TSA): A Recommended Methodological Framework (UN, UNWTO, OECD, Eurostat, 2010) developed by UNWTO (UN Tourism from 2024), OECD and

Eurostat were published. The conceptual framework of the tourism satellite accounts is based on a direct structural link of the definitions and concepts of tourism with those used in the 1993 System of National Accounts and in the fifth edition of the IMF Balance of Payments Manual.

In **paragraph 1.2** Methodological guidelines in the field of tourism statistics, developed by the United Nations World Tourism Organization, are presented. The International Recommendations on Tourism Statistics (UN, UNWTO, 2010) and the related Compilation Manual (UN, UNWTO, 2016), as well as the Tourism Satellite Accounts (UN, UNWTO, OECD, Eurostat, 2010) are reviewed.

International recommendations for tourism statistics (**IRTS 2008)** have been prepared by the World Tourism Organization (UNWTO) in close collaboration with the United Nations Statistics Division, the International Labour Organization (ILO) and other members of the Inter-Agency Coordination Group on Tourism Statistics established in 2004 – the United Nations Statistics Division, the Organisation for Economic Co-operation and Development, Eurostat, the International Monetary Fund and the World Trade Organization. The Recommendations on International Tourism represent the efforts of UNWTO and the United Nations Statistics Division to provide countries with a methodological and operational basis for tourism statistics in an integrated manner, with the main objective of improving the coherence of tourism statistics with other official statistics and further developing tourism satellite accounts. The main objective of the International Recommendations is to present a system of related definitions, concepts, classifications and indicators that facilitate the link between the conceptual frameworks of the system of national accounts, tourism satellite accounts, balance of payments and labour statistics. General guidance is provided regarding data sources and data compilation methods, which are included in the specific compilation manual.

The Compilation Guide to the International Recommendations for Tourism Statistics (IRTS 2008: CG) provides guidance on how to submit information to UNWTO that is suitable for inclusion in the Compendium of Tourism Statistics as the most comprehensive international statistical database on tourism, thereby achieving international comparability and a better understanding of tourism worldwide. It discusses new data sources and opportunities for the application of statistical methods that can be adapted in a timely manner to changing circumstances. It includes comments and explanations of the various concepts introduced and used in IRTS 2008, examines the problems underlying these recommendations, provides guidance on how to compile the recommended variables and aggregates, and includes examples of good practices in specific countries that have addressed specific problems.

The recommended methodological framework for the 2008 Tourism Satellite Accounts (TSA: RMF 2008) provides conceptual consistency with the System of

National Accounts 2008 (SNA 2008) and the Balance of Payments and International Investment Position Manual (BPM6). The methodology provides an additional resource for linking tourism statistics with the standard tables of the SNA 2008. Tourism satellite accounts, on the one hand, are a statistical tool that complements the concepts, definitions, aggregates and classifications presented in the International Recommendations for Tourism Statistics 2008 and formulates them in analytical tables that provide elements for comparing estimates between regions, countries or groups of countries. On the other hand, they provide guidance to countries in the further development of their tourism statistical systems, the main objective being the establishment of national tourism satellite accounts.

In **a paragraph 1.3** the methodological guides in the field of tourism statistics in the European Union countries are presented. **The European Community methodology for tourism statistics** (Eurostat – DG XXIII, 1998) is the result of fruitful cooperation with the OECD and the WTO. It takes into account the Recommendations on Tourism Statistics, prepared by the World Tourism Organization and adopted by the United Nations Statistical Commission at its twenty-seventh session in 1993. In developing tourism statistics, the participants in the tourism process are presented as visitors (tourism demand) and direct suppliers (tourism supply). The interrelationship between the factors influencing tourism, the impact of tourism, demand and supply is presented schematically using 5 main parts: main external factors influencing tourism demand; the different consumer markets in tourism from the point of view of existing statistics, which in turn are divided into same-day visits and visits involving at least one overnight stay; the impact of tourism demand (different segments), expressed through economic and social indicators and those related to the environmental impact of tourism; tourism policy in various aspects, implemented by government organizations, which affects both tourism supply and demand; relationship between demand and supply in different markets from a marketing perspective (product strategy, pricing, channels and promotion solutions).

With the Methodological Guide for Design and Research of Inbound Tourism (European Commission, Eurostat, 2000) it supports the collection and processing of comparable statistics on inbound tourism, consistent with the Community methodology for tourism statistics and Council Directive 95/57 (Official Journal L291, 1995) on tourism statistics. It provides comprehensive guidelines for the collection of statistics on inbound tourism in both quantitative and qualitative terms. It covers visitor flows, visitor and trip characteristics, consumer behaviour, type of area (closed or open) and recommends an appropriate system of surveys, depending on the needs of the researchers.

By Regulation (EU) No. 692/2011 (Official Journal of the European Union, L 192/17, 2011) European statistics on tourism are established. A common framework

for the systematic development, production and dissemination of European statistics on tourism is established. Each Member State should collect, produce, process and transmit harmonised statistical data on the demand for and supply of tourism services. Basic concepts such as reference period, reference year, statistical classification of economic activities for the needs of tourism, classification of territorial units for the preparation of regional statistics, usual environment, tourism, local tourism, inbound tourism, outbound tourism, national tourism, domestic tourism, tourist accommodation, non-rental accommodation, same-day visits are defined.

In **the Methodological Guide for Tourism Statistics**, version 3.1 (Eurostat, 2014) contains recommended guidelines for the implementation of Regulation No 692/2011 on European tourism statistics. It has been developed in line with international guidelines implemented in the International Recommendations for Tourism Statistics (IRTS 2008) and its compilation manual (IRTS 2008: CG), the recommended methodological framework for tourism satellite accounts (TSA:RMF 2008), the Balance of Payments and International Investment Position Manual (IMF, 2009) and the Manual on Statistics of International Trade in Services 2010 (DESA, 2011). Its main objective is to support the authorities collecting tourism statistics in the EU and in third countries and to promote harmonisation through the use of common standards.

In **paragraph 1.4** the conceptual foundations of statistical research on tourism are presented. **Tourism** is understood as the activity of people who travel to and stay in places outside their usual environment for not more than one consecutive year for recreation, business and other purposes. With regard to the reference country, the three main **forms of tourism** are domestic, inbound and outbound. **Domestic tourism** includes travel activities within the country carried out by tourists who are residents of the reference country but outside their usual environment. **Inbound tourism includes** visits by non-residents within the reference country. **Outbound tourism** refers to the travel activities of residents outside the country in which they live.

After combining the forms of tourism, three **categories of tourism are distinguished:** internal, national and international. **Internal tourism** includes both inbound and outbound tourism. This refers to all activities of domestic and foreign visitors within the reference country as part of domestic or international trips. **National tourism** includes travel by residents within the country and outbound tourist trips, i.e. all activities of local residents related to domestic or international travel are taken into account. **International tourism** includes inbound and outbound tourism, i.e. it covers the travel activities of residents outside their country of permanent residence and the activities of foreign visitors to the territory of the reference country, carried out as inbound trips. The relationships between the forms and categories of tourism can be presented with the help of Fig. 1.

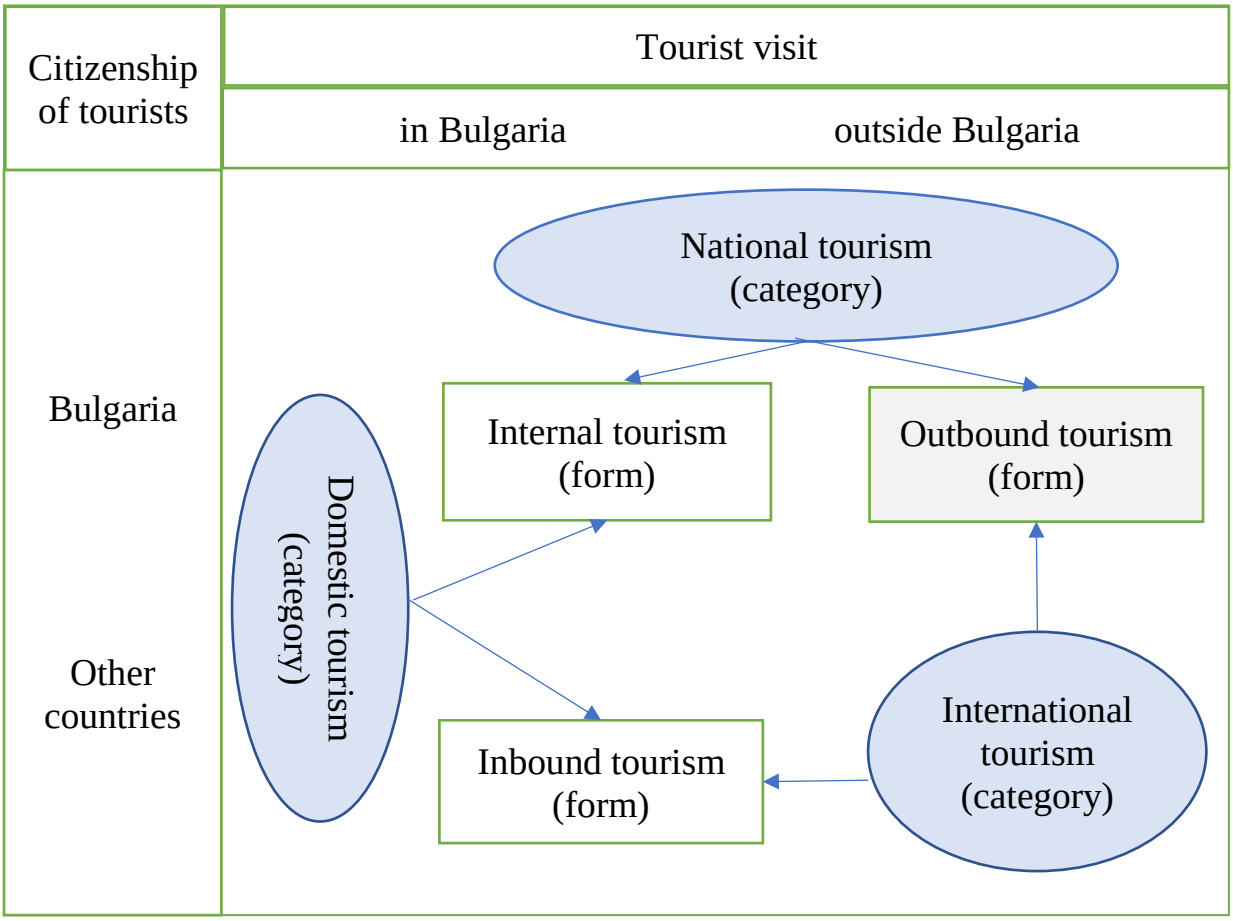

Fig. 1. Forms and categories of tourism
Source: Adapted from (Kazandzhieva, 2022)

Tourist travel is any personal or professional trip of persons outside their place of residence for a period of up to one year, where the purpose is not to perform an activity for remuneration. **Personal travel** includes vacation, visits to cultural events, sports, medical treatment, education, religious events, visiting relatives and friends, and others, professional ones refer to business trips, participation in conferences, congresses, concluding deals, and more. **A visitor** is any person who arrives in a place other than his usual environment for a period of up to one year and the visit is not related to the performance of an activity for remuneration. A person's usual environment includes both the places located near his home and the places frequently visited by him.

The **total contribution** of tourism to GDP is calculated as the sum of the contributions of the direct, indirect and induced effect (contribution). **The direct contribution** represents that part of GDP that is created entirely in tourism and

transport, and this includes the economic activities of hotels, travel agencies, transport and tour operator companies, as well as those carried out by the restaurant industry and other activities related to serving tourists. **Indirect contributions** are associated with sector activities and are a function of three factors - capital investments in tourism, government (public) spending to support the tourism sector, and supply chain activities through which tourism sector enterprises resort to purchasing local goods or services. The **induced contribution** is measured by the expenditures incurred by individuals who are directly or indirectly employed in the tourism sector.

In **paragraph 1.5** presents an overview of contemporary empirical research on tourism in Bulgarian literature. Scientific publications – monographs, studies, articles and reports of well-known established specialists in tourism economics, as well as analysts and statisticians, covering national and global problems occurring in the field of tourism, are examined. The characteristic includes publications by Bulgarian authors, such as V. Yaneva, E. Velikova, S. Rakadzhiyska, M. Asenova, P. Evrev, E. Dogramadzhieva, V. Kazandzhieva, S. Ivanov, Z. Karadzhova, V. Marinov, A. Naydenov, D. Varadzhakov, P. Petkov, M. Shopova, M. Bozhinova, L. Ilieva, P. Ivanova, L. Todorova and others.

The number of studies conducted regarding tourism in Bulgaria is significant. The publications are systematically presented and presented in seven areas: local and domestic tourism; sea, mountain and metropolitan tourism; traditional and new forms of tourism; national tourism in an international context; inbound tourism; outbound tourism; typical problems in the tourism sector. Thematic conferences dedicated to tourism in general and Bulgarian tourism in particular are also presented.

Despite numerous national publications on the topic, the use of statistical and econometric approaches in the analysis of ongoing processes in tourism is an exception in the scientific literature. The application of statistical and econometric and mathematical methods and models for deriving dependencies and analyzing empirical results is common practice in foreign tourism research, while in Bulgaria their application is partially represented. The correct use of statistical and econometric methods of analysis leads to obtaining results and to formulating conclusions and inferences that would be useful in developing strategic decisions for the development of the industry.

CHAPTER TWO
INFORMATIONAL AND METHODOLOGICAL ASPECTS OF TOURISM RESEARCH

The second chapter presents the information provision of the statistical survey of tourism in Bulgaria. The main essential characteristics of the statistical methods for the analysis of dynamic statistical series, of the methods for assessing seasonal fluctuations and of the methods for characterizing the dynamics of structural changes are examined.

In **paragraph 2.1.** the information provision of the statistical survey of tourism in Bulgaria is discussed. The methodologies applied by the National Statistical Institute in the survey of tourism are fully harmonized with the European legislation in the field of tourism statistics and with the recommendations of the World Tourism Organization. The proposed standard definitions recommended by the World Tourism Organization have also been adopted.

By **monitoring the visits of foreigners to Bulgaria and the travels of Bulgarian citizens abroad** (NSI, n. d.). Information is obtained on the number of visits by foreigners to Bulgaria, as well as on the trips made by Bulgarian citizens outside the country by purpose of travel and by country. **Information is obtained** on the number of visits by foreigners to Bulgaria, as well as on the trips made by Bulgarian citizens outside the country by purpose of travel and by country. The **main motives** for visiting are divided into four main groups: excursion, rest or entertainment (visits to cultural or historical landmarks, sports events, etc.); visiting (with relatives or acquaintances); business purpose (business trips, participation in conferences, congresses and symposiums, etc.); other reasons for visiting. When determining the country from which tourists come, their citizenship is used. The accommodation observation (NSI, n.d.) provides a variety of information on the activities of accommodation establishments in Bulgaria. Data are collected by type of accommodation establishments, on the nights spent in them, on the number of people who stayed overnight, on the income from overnight stays, etc. In order to obtain the indicator for the number of beds in overnight establishments in operation, the number of beds is monitored for each day of the reporting period, regardless of whether they were occupied or not. Income from overnight stays in accommodation establishments includes only the value of the nights paid by guests, without taking into account the value of additional services.

By monitoring tourist trips and tourism expenditure of the population (NSI, n.d.) the reasons for the population's tourist trips in the country and abroad and the expenses related to these trips are analyzed. Data is provided on the number of

tourists, the number of tourist trips in the country and abroad, as well as the expenses for the trips.

When reporting **tourism satellite accounts** in Bulgaria, aggregated data obtained from several main surveys are used - a report on the activity of accommodation facilities, a survey to study tourist trips of the population and a sample survey of Bulgarian and foreign citizens passing through border checkpoints, the country's balance of payments, national accounts, annual report on the activities of tour operators and travel agencies, a report on the activities of museums, etc. Tourism satellite accounts include expenditures in current prices of residents (Bulgarian citizens) in the country, non-residents (foreign citizens) in the country and residents (Bulgarian citizens) abroad.

The selection of **inbound tourism indicators**, which are analyzed in the empirical part of this study, was made in accordance with the methodology for tourism statistics adopted by the NSI and unified with Eurostat and the UN World Tourism Organization. To track the dynamics and characterize the structural changes, annual data on the number of visits by foreigners to Bulgaria for the period from 2008 to 2023, available in the NSI Infostat information system, were used. In the analysis of seasonality, monthly data on visits for the period from January 2008 to October 2024 were used. In addition to the total number, visits are analyzed by motives and by group of countries, according to the Nomenclature on the countries for tourism statistics purposes. Ultimately, the analysis is carried out with respect to the following indicators: arrivals of visitors from abroad to Bulgaria (total); arrivals of visitors from abroad to Bulgaria holiday and recreation purpose; arrivals of visitors from abroad to Bulgaria by professional purpose; arrivals of visitors from abroad to Bulgaria by other purposes; arrivals of visitors from abroad to Bulgaria from the EU (total); arrivals of visitors from abroad to Bulgaria from the EU holiday and recreation purpose; arrivals of visitors from abroad to Bulgaria from the EU by professional purpose; arrivals of visitors from abroad to Bulgaria from the EU by other purposes; arrivals of visitors from abroad to Bulgaria from other European countries (total); arrivals of visitors from abroad to Bulgaria from other European countries holiday and recreation purpose; arrivals of visitors from abroad to Bulgaria from other European countries by professional purpose; arrivals of visitors from abroad to Bulgaria from other European countries for other purposes; arrivals of visitors from abroad to Bulgaria from other countries (total); arrivals of visitors from abroad to Bulgaria from other countries holiday and recreation purpose; arrivals of visitors from abroad to Bulgaria from other countries by professional purpose; arrivals of visitors from abroad to Bulgaria from other countries by other purposes; arrivals of visitors from abroad to Bulgaria from the rest of the world (total); arrivals of visitors from abroad to Bulgaria from the rest of the world holiday and recreation purpose; arrivals of visitors from abroad to Bulgaria from

the rest of the world by professional purpose; arrivals of visitors from abroad to Bulgaria from the rest of the world by other purposes.

In **paragraph 2.2**, the statistical toolkit for time series analysis is presented, with the emphasis of the presentation being placed on those statistical quantities and specific statistical methods whose cognitive capabilities make them suitable for characterizing changes in foreign tourist visits. The stages through which modeling and forecasting of the development trend usually goes are presented, namely:

1. Checking for the presence of a trend using appropriate criteria.
2. Modeling the development trend with relevant regression equations.
3. Choosing the most appropriate function for trend modeling.
4. Forecasting based on trend models.

The components of time series and the main methods for identifying the main component of development – the trend are described. The main drawback of the Spearman and Kendall rank correlation coefficients in time series analysis is indicated - they can only diagnose a monotonic trend, i.e. when there is only an increase or only a decrease in the time series, and in such cases the use of the first-order autocorrelation coefficient and the Box-Pierce and Ljung-Box Tests based on it is justified. The specifics of the test procedures in the analysis of short time series are presented, which is an important point in the processing of annual data on foreign tourist visits, due to the limited period of the study (2008–2023).

The presentation provides a synthesized characterization of the main trend models suitable for modeling the workforce: the polynomials of time from the first to the third order, the hyperbola and the semi-logarithmic function. The main criteria for choosing a trend function are indicated - the standard error of the model, the ordinary and adjusted coefficient of determination, the Fisher test and the information criteria, with a place devoted to the specifics of their application. The stages in implementing short-term forecasting based on the most suitable models for modeling the trend are clarified.

In **paragraph 2.3**, the main statistical methods for assessing the influence of individual components and in particular the seasonal component are discussed. They differ from each other in the number and sequence of stages by which the influence of individual components is determined and in the stage at which the decomposition of the individual influence of components is perceived as the most accurate (Labotsky, 2005, p. 50). The choice of the model describing the relationships between individual components (additive or multiplicative) is based on an analysis of the structure and value of the seasonal variation. When fluctuations have relatively constant amplitudes, the additive model is relied on, in which the values of the seasonal component remain constant in different cycles (months, quarters or seasons). When there is a change in

amplitudes (fluctuations increase or decrease over time), the multiplicative model is used.

Various methods are applied to decompose the time series into components in order to determine the individual influence of each component (Hyndman & Athanasopoulos, 2021). Among the most used are the classical method, X-11 ARIMA (and its variants X-12 ARIMA and X-13 ARIMA), TRAMO, SEATS, STL. Analyzing the strengths and weaknesses of the individual methods, starting from the nonlinear model of trends in incoming visits of foreign tourists, taking into account the serious impact of COVID-19 on the dynamics of the analyzed time series, it is justified that for the needs of analyzing seasonality in foreign tourist visits, the X13 ARIMA, TRAMO and SEATS methods, as well as combinations between them, would be most suitable. Supporting this solution is the possibility of using integrated modules in the Gretl environment, which apply algorithms for decomposing time series developed by banking institutions and statistical departments.

In **paragraph 2.4**, the methodological aspects of the statistical analysis of the structure of incoming visits of foreign tourists are presented, describing the content and possibilities for applying different methods. By presenting the statistical and analytical approach to the analysis of structural changes, the preference for the statistical approach to the analysis of the structure of incoming visits of tourists is justified. The two groups of indicators for the study of structural changes, differences and unevenness through the statistical approach are presented - individual and general. The individual measures include absolute increases and differences in relative shares, indices of relative shares and relative increases and differences in relative shares. Their clear, meaningful interpretation and easily applicable calculation procedures are indicated as advantages for their application.

The need for a comprehensive picture of structural changes in inbound tourist visits necessitates the use of summary measures. The index of differences, the linear and quadratic coefficients of absolute and relative structural changes, and the integral coefficient of structural changes are presented. The choice of the integral coefficient as a summary measure of structural changes in the study is justified both because of its sensitivity to small changes and differences and because it measures both absolute and relative structural changes.

CHAPTER THREE
STATISTICAL ANALYSIS OF VISITS BY FOREIGNERS TO BULGARIA

The third chapter is devoted to the modeling and forecasting of visits by foreign citizens to Bulgaria (inbound tourism) by motives of the visit and by groups of countries according to the Nomenclature on the countries for tourism statistics purposes, applied by the NSI. The dynamics of the individual types of visits of foreign tourists according to the motives for visiting by groups of countries are studied, using different models for determining the trend, as well as different methods for characterizing seasonality in relation to inbound tourism. The structural changes that have occurred in the dynamics of visits are monitored both between the individual groups of countries and within the groups.

In **paragraph 3.1**, a comparative analysis of international tourism in Bulgaria and a group of European countries was carried out. The tracking of the position of Bulgarian tourism on the international market is carried out on the basis of indicators for inbound and outbound tourism, as well as those related to the assessment of the contribution of tourism to the gross domestic product, calculated as a relative share. Four European countries were selected – Greece, Romania and Turkey as neighbors of Bulgaria, and Hungary, as a Central European, former socialist country. Greece, Romania and Turkey were selected, in addition to their geographical proximity to Bulgaria, and for the reason that these countries have the highest values of the indicators, both in terms of registered visits to Bulgaria by citizens from these countries and in terms of trips by Bulgarian citizens to them. Hungary, on the one hand, was selected due to similarity in territory and population, and on the other hand – due to the equal standard of living with Bulgaria. According to recent studies (Eurostat, 2024), in 2023 In terms of actual individual consumption per person, expressed in purchasing power standards, Bulgaria and Hungary share the last place among the European Union countries with 70% of the EU average. The comparative analysis aims to track how the state policy is implemented in terms of stimulating the development of the tourism sector.

The global crisis of 2008 negatively affected **visits by foreign tourists** only in Bulgaria and Romania, while there is no data for Greece. And if in Bulgaria the number of visits from 2008 was achieved already in 2011, then in Romania the recovery continued until 2015. The global crisis in Hungary and Turkey had almost no impact on tourist visits, as positive growth rates were recorded in all subsequent years.

The impact of the COVID-19 pandemic on all countries, without exception, is much stronger. In 2020, the decrease was most noticeable in Greece (by 78%) and Turkey (69%). The recovery is taking place at different speeds in individual countries,

with the fastest rates of reaching pre-pandemic levels in Turkey and Romania. In 2022, foreign tourist visits to Turkey were 0.7% less than in 2019, and in Romania - by 0.9%. The recovery is taking place the slowest in Hungary, where visits in 2022 were only 75.5% of those in 2019. In Bulgaria and Greece, visits in 2022 were 86.7% and 87.9%, respectively, of foreign tourist visits registered in 2019.

The global crisis of 2008 negatively affected **the trip abroad** of citizens from all the countries compared, except those from Turkey. The 2008 levels were reached the following year in Greece, while in the other countries, the recovery is much slower. In Hungary and Romania, the global crisis was overcome in 2015, and in Bulgaria – only in 2017.

The impact of the COVID-19 pandemic is most serious in Turkey and Greece, where in 2020 a decline in foreign travel was recorded by over 66% and 70% respectively. In 2022, the levels of travel from 2019 were not achieved in any country, with the slowest processes in Greece. There, foreign travel made up only 65% of travel in 2019, while the best indicators are for Turkey and Romania, where 75% were reached. In Bulgaria, the levels were reached at 74%, and in Hungary – at 72%.

The global crisis of 2008 negatively affected **international tourism revenue** in all the countries compared, without exception. Pre-pandemic levels were reached most quickly in Turkey and Greece, in 2011 and 2014, respectively. In the remaining countries, the recovery rates are much lower. The 2008 levels were reached in 2017 in Hungary and Romania and in 2018 in Bulgaria. This means that in these three countries, the exit from one crisis is followed by the entry into another, even more serious crisis, which is the pandemic.

The impact of the COVID-19 pandemic is most serious again in Greece and Turkey, where in 2020 a decline in receipts was recorded by 73% and 63% respectively. The recovery is proceeding at different speeds, with Turkey and Romania being the fastest in this case. In 2022, the 2019 levels in these countries were exceeded by 26% and 19% respectively. In the remaining three countries, the speed is much slower. In Greece and Hungary, receipts in 2022 are 87-88% of the 2019 receipts. Bulgaria remains at the tail end with levels of 77%.

The impact of the 2008 global crisis on the dynamics of **total contribution of tourism and travel to GDP** would be difficult to determine, since the curves characterizing the trends in the countries under consideration do not change their directions abruptly. If, however, one was to trace when the levels achieved in 2008 were restored, it could be concluded that the processes in Bulgaria and Romania were developing the slowest. At the end of the period (in 2019), in Bulgaria the share of total contributions was 82% of that achieved in 2008, and in Romania – 85%. However, the negative trend in Bulgaria cannot be blamed solely on the Global Crisis, since the decline began immediately after 2005.

The impact of the 2008 global crisis on the dynamics of **share of direct contribution from tourism and travel to GDP** it is also difficult to determine, since the curves characterizing the trends in the countries under consideration do not change their directions sharply again. The processes in Bulgaria and Romania are developing most negatively. At the end of the period (in 2019), the share of direct contributions in Bulgaria was 82% of that achieved in 2008, and in Romania the 2008 levels were exceeded in 2017. In Greece, Hungary and Turkey, compared to 2008, the share of direct contributions from tourism in 2019 increased by 61%, 24% and 14%, respectively.

It is also difficult to determine, since the curves characterizing the trends in the countries under consideration do not change their directions sharply again. The processes in Bulgaria and Romania are developing most negatively. At the end of the period (in 2019), the share of direct contributions in Bulgaria was 82% of that achieved in 2008, and in Romania the 2008 levels were exceeded in 2017. In Greece, Hungary and Turkey, compared to 2008, the share of direct contributions from tourism in 2019 increased by 61%, 24% and 14%, respectively.

During the period 2000-2014, **the share of inbound tourism revenues in GDP** Bulgaria's share is above the average share in the world, with the highest levels (over 10%) being registered in 2004 and 2005. Overall, the levels are higher than those in the countries being compared, with only Greece overtaking Bulgaria after 2014. The rise was followed by a sustained decline, as a result of which in 2015 the share in Bulgaria acquired lower dimensions than the share calculated as an average for all countries. The downward trend continued until the end of the period, with the levels remaining below the average levels. In Greece, the trend proceeded differently. At the beginning, the levels were much lower than those in Bulgaria, but they were higher than the average levels. Then, in the period from 2003 to 2012, the share of income was also lower than the average world levels. From 2014, the trend was upward and continued until 2019, reaching levels of 11.21%. In Hungary, like Greece in the period from 2000 to 2002, the percentage was higher than the average, but after that the levels remained well below the average, despite the increasing trend. In Romania and Turkey, the share of receipts from international tourism remained below the average, which means that the economies in these countries are developing even without a significant contribution from tourism. This is especially true for Romania, where receipts during the period did not exceed 2% as a share of GDP.

The results of the comparative analysis show that despite the many expectations and initiatives from national and local government bodies, Bulgarian tourism has been experiencing serious difficulties in recent years, which have been further exacerbated by the pandemic related to the spread of Covid-19. As a result of all this, Bulgaria is

starting to lose its positions in international markets, significantly lagging behind Hungary, Greece and Turkey, but still ahead of Romania.

In **paragraph 3.2**, a general description of the dynamics of the indicators is made. Annual indicators of inbound tourism for the period from 2008 to 2023 are analyzed. In addition to their total number, visits are analyzed by the purposes for visiting: excursion, holiday and recreation; visiting friends and relatives; professional purpose; other purposes for visiting. Since the tables with the results available in the INFOSTAT system of the NSI do not provide information on tourists whose purpose is visiting friends and relatives, indicators presented in four groups according to the motives for visiting are used here – total, holiday and recreation, by professional purpose and by other purposes. In each of the four groups, visits are summarized in five categories according to the citizenship of the visitors: total; European Union; other European countries; other countries; rest of the world. Ultimately, the analysis of the dynamics is carried out with respect to 20 indicators. The results of the visual analysis of the studied indicators determine the following more important conclusions:

- The global crisis of 2008 had a short-term negative impact, with a rapid recovery in the following indicators of inbound tourism: “total arrivals of visitors”, “arrivals of visitors holiday and recreation purpose”, “total arrivals of visitors by other purposes”, “arrivals of visitors from the EU by other purposes”, “total arrivals of visitors from other European countries”, “visits of citizens from other European countries for leisure and excursion”, “total number of visits of citizens from other countries”, “arrivals of visitors from other countries holiday and recreation purpose” and “arrivals of visitors from other countries by other purposes”.
- The global crisis has a long-term negative impact on the following indicators: “arrivals of visitors from the EU holiday and recreation purpose”, “total arrivals of visitors from the EU”, “arrivals of visitors from other European countries for other purposes”, “arrivals of visitors from other countries by professional purpose”.
- The global crisis has a positive impact on the following indicators: “total number of professional arrivals of visitors”, “professional arrivals of visitors from the EU”, “professional arrivals of visitors from other European countries” and the four groups of visits of citizens from the “rest of the world”.
- The COVID-19 pandemic is having a negative impact and by 2023 the pre-pandemic levels have not yet been reached for the indicators: “total arrivals of visitors holiday and recreation purpose”, “total arrivals of visitors by professional purpose”, “total arrivals of visitors from the EU”, “arrivals of visitors from the EU by professional purpose”, “arrivals of visitors from the EU by other purposes”, “arrivals of visitors from other European countries holiday and recreation purpose”, “total arrivals of visitors from other countries”, “arrivals of visitors from the rest of the world by professional purpose”, “arrivals of visitors from the rest of the world holiday and

recreation purpose" and "arrivals of visitors from the rest of the world by other purposes".

- The COVID-19 pandemic has a negative impact, but by 2023, pre-pandemic levels have been reached for the indicators: "total arrivals of visitors", "total arrivals of visitors by other purposes", "arrivals of visitors from the EU holiday and recreation purpose", "total arrivals of visitors from other European countries", "arrivals of visitors from other European countries by professional purpose", "arrivals of visitors from other European countries for other purposes", "total arrivals of visitors from the rest of the world", "arrivals of visitors from the rest of the world by professional purpose" and "arrivals of visitors from the rest of the world by other purposes".
- The COVID-19 pandemic does not have a negative impact only on the indicator "arrivals of visitors from other countries by other purposes ".

The identification of the development trend was carried out with Box-Pierce and Ljung-Box tests and with the first-order autocorrelation coefficient. After calculating the empirical characteristics and performing the statistical tests, it was found that a trend exists for 17 of the analyzed indicators. The diagnostic criteria showed that for the indicators "total arrivals of visitors", "arrivals of visitors holiday and recreation purpose" and "total arrivals of visitors from the EU" (Table 1).

In the three time series, successive increases and decreases are observed, which are random in nature and fluctuate around a constant value. In these time series, the trend is insignificant according to the Box-Pierce and Box-Lyung tests. Using the Box and Pierce test, a trend is identified only in 12 time series, while using the Box and Lyung test – in 13 indicators. Taking into account that in short time series, the Box-Pierce and Box-Lyung tests are shifted and preference should be given to the first-order autocorrelation coefficient (Ivanov, Kasabova, & Shopova, 2017, p. 78), all 17 time series are subjected to modeling, in which the presence of a trend is established using the first-order autocorrelation coefficient.

The construction and solution of the trend models of the main patterns in the development of the remaining series with an established statistically significant trend follows the general scheme of econometric modeling. A linear model (included as a basis for comparison), a parabola (allowing one change in direction), a cubic model (allowing two changes), a hyperbola and a semi-logarithmic model were tested. The sequential solution and diagnostic verification of the trend models established that only in two of all 17 time series the results are not encouraging. These are the models with which the trend of visits of tourists from other countries is assessed - in general and for the holiday and recreation purpose. In both cases, the semi-logarithmic function is chosen as the most suitable, but the variation explained by it amounts to 43.3% and 38.9%, respectively. Everywhere the trend towards both increase and

decrease is correctly presented. At the same time, the impact of the global pandemic has been adequately assessed, which in all models leads to a decrease in the number of visits.

Table 1

Identifying the development trend in indicators reflecting tourist visits to Bulgaria

Country of origin	Categories by purpose of visit	r_1	*BP*	*BL*	Conclusion
Total	Total	0,328	1,720	2,064	No trend
	Holiday and recreation	0,311	1,547	1,857	No trend
	Professional	**0,452**	3,269	**3,923**	There is a trend
	Others	**0,629**	**6,334**	**7,601**	There is a trend
European Union	Total	0,310	1,533	1,840	No trend
	Holiday and recreation	**0,403**	2,595	3,114	There is a trend*
	Professional	**0,412**	2,712	3,254	There is a trend*
	Others	**0,648**	**6,721**	**8,065**	There is a trend
Other European countries	Total	**0,561**	**5,039**	**6,047**	There is a trend
	Holiday and recreation	**0,648**	**6,711**	**8,053**	There is a trend
	Professional	**0,942**	**14,187**	**17,025**	There is a trend
	Others	**0,790**	**9,979**	**11,974**	There is a trend
Other countries	Total	**0,385**	2,373	2,847	There is a trend*
	Holiday and recreation	**0,394**	2,479	2,975	There is a trend*
	Professional	**0,651**	**6,771**	**8,125**	There is a trend
	Others	**0,930**	**13,839**	**16,607**	There is a trend
Rest of the world	Total	**0,530**	**4,499**	**5,399**	There is a trend
	Holiday and recreation	**0,602**	**5,798**	**6,958**	There is a trend
	Professional	**0,827**	**10,941**	**13,129**	There is a trend
	Others	**0,738**	**8,709**	**10,451**	There is a trend

Note: The notations in the table are as follows: r1 denotes the first-order autocorrelation coefficient, BP denotes the Box and Pierce test, and BL denotes the Box and Ljung test.

Significant estimates at a significance level of $\alpha = 0.05$ are marked in bold.

* indicates situations in which the trend is accepted with certain conditions.

Source: Author's calculations.

In seven of the time series, the second-degree polynomial is applied as the most appropriate model (total number of visits by foreign tourists for professional purposes, total number of visits by foreign citizens for other purposes, number of visits by tourists from the EU for professional purposes, number of visits by tourists from other European countries for holiday and recreation, number of visits by tourists from other European countries for profesional purposes, number of visits by tourists from the rest of the world (total), number of visits by tourists from the rest of the world for leisure purposes), and in five – the third-degree polynomial (number of visits by tourists from the EU for other purposes, number of visits by tourists from other European countries for other purposes, number of visits by tourists from other countries for other purposes, number of visits by tourists from the rest of the world for professional purposes,

number of visits by tourists from the rest of the world for other purposes). The semi-logarithmic function is used three times.

For **forecasting** purposes two scenarios have been applied – pessimistic and optimistic. In *the pessimistic scenario* the impact of COVID-19 is considered, and the models discussed above are used in calculating the forecast values, with the inclusion of a dummy variable for 2020. In *the optimistic option* the impact of the crisis related to the Covid pandemic is not considered, and the forecast values are calculated using models without the inclusion of a dummy variable for 2020. In six of the time series, the second-degree polynomial is applied as the most appropriate model without including a dummy variable to reflect the impact of COVID-19 (number of visits by tourists from the EU for professional purposes, number of visits by tourists from the EU for other purposes, number of visits by tourists from other European countries for holiday and recreation purpose, number of visits by tourists from other European countries for professional purposes, number of visits by tourists from the rest of the world for recreation purposes, number of visits by tourists from the rest of the world for professional purposes), and in five – the semi-logarithmic function (number of visits by tourists from the EU for holiday and recreation, total number of visits by tourists from other countries), number of visits by tourists from other countries for holiday and recreation purpose, number of visits by tourists from other countries for professional purposes, total number of visits by tourists from the rest of the world). The third degree polynomial (number of visits by tourists from other European countries for other purposes, number of visits by tourists from other countries for other purposes, number of visits by tourists from the rest of the world for other purposes) is used three times, the linear function (total number of visits by foreign citizens for other purposes, total number of visits by tourists from other European countries – twice, and the hyperbola (total number of visits by foreign tourists for professional purposes) – once.

The calculation of the forecasts is carried out with the assumption that the effects of the global pandemic will subside and the dynamics of inbound tourism will return to its trend from the pre-pandemic period. In case of violation of this assumption, it is possible that the calculated forecasts may deviate significantly from the actual values. Taking into account the fact that the cubic and parabolic functions are difficult to apply for forecasting, because there is usually no appropriate economic interpretation of their parameters and they can lead to negative forecast values for the estimates of the forecasted values or, at best, to forecasts that rarely match reality, the presented results should be considered only as an outline of the most general future trends in the development of the time series, which represent the visits of foreign citizens to Bulgaria. The results of the short-term forecasting with a forecast horizon of

three years with the application of an optimistic and pessimistic scenario are the following:

- An **increase** is expected in the following groups: “total number of visits for professional purposes”, “total number of visits by citizens from other European countries”, “visits by citizens from other European countries for professional purposes”, “visits by citizens from other European countries for other purposes”, “total number of visits by citizens from other countries”, “visits by citizens from other countries for holiday and recreation purposes”, “visits by citizens from other countries for other purposes” and “visits by citizens from the rest of the world for other purposes”.
- A **decrease** is expected in the following groups: "total number of visits for professional purposes", "visits of EU citizens for professional purposes", "visits of EU citizens for leisure and excursion", "visits of EU citizens for other purposes", "visits of citizens from other European countries for holiday and recreation", "visits of citizens from the rest of the world for holiday and recreation".
- **Different** forecasts with the two options have been achieved in terms of the total number of visits by citizens from the rest of the world and visits from the rest of the world for professional purposes. With an optimistic option, an increase is predicted in the first case, and an increase in the second case. With a pessimistic scenario, the forecasts are opposite, towards a decrease and towards an increase, respectively.

In **paragraph 3.3**, in order to determine the individual influence of the individual components of the analyzed time series and to isolate the influence of the seasonal component, the X-13 ARIMA-SEATS and TRAMO/SEATS methods are applied, which can be added as modules in the Gretl for Windows environment. By studying the dynamics of realized visits of foreign citizens to Bulgaria, both the influence of seasonal factors and those determining the general development trend are diagnosed and isolated. Monthly data are used, referring to the period from January 2008 to October 2024, which were obtained using the INFOSTAT system of the National Statistical Institute. With the help of the applied methods, forecasts with a horizon of two or three years for the future values of visits are calculated. The main results of the analysis of seasonality with both approaches are as follows:

- When seasonally adjusting and decomposing the time series into component parts with the X13 ARIMA-SEATS and TRAMO/SEATS methods, similar results are obtained, but with the coefficients of determination being better with X13 ARIMA-SEATS, the results are characterized as better when analyzing the following indicators: "total number of visits" (in terms of trend modeling), "total number of visits from other European countries" (in terms of seasonally adjusted data), "total number of visits for holiday and recreation purposes" (trend and seasonal adjustment) and "total number of visits for professional purposes" (trend).

- When seasonally adjusting and decomposing the time series into component parts with the TRAMO/SEATS method, the results are better when analyzing the following indicators: "total number of visits" (seasonal adjustment), "total number of visits from other European countries" (trend), "total number of visits for professional purposes" (seasonal adjustment), "total number of visits by EU citizens" (trend and seasonal adjustment), "total number of visits for other purposes" (trend and seasonal adjustment), "total number of visits by citizens from other countries" (trend and seasonal adjustment) and "total number of visits by citizens from the rest of the world" (trend and seasonal adjustment).
- For all indicators, seasonal adjustment and time series component decomposition methods predict an increase in the next two (with TRAMO/SEATS) or three (with X13 ARIMA-SEATS) years.
- The time series forecasting assumes two peaks per year in the total number of business visits only. The strongest months are expected to be May and October, and the weakest are February and August.
- August is expected to be the strongest month for: total number of visits by foreign tourists, visits by tourists from the EU, visits by tourists from other European countries, visits by tourists from other countries, visits by tourists from the rest of the world, visits by tourists for holiday and recreation purposes and visits by tourists for other purposes. February is expected to be the weakest for visits by tourists from other European countries, November for visits for holiday and recreaton purposes, February and November for total visits, visits from other countries and visits for other purposes, and the period from November to April for visits from the rest of the world and visits from the EU.

In **paragraph 3.4**, changes in the structure of incoming visits are analyzed both in terms of the motives for the visit and in terms of the countries from which the tourists come. Emphasis is placed on the diversity within the individual groups of countries, according to the Nomenclature on the countries for tourism statistics purposes – European Union, other European countries, other countries and rest of the world. In order to track the change in these structures in terms of the number of visits by foreigners to Bulgaria, annual data covering the period from 2008 to 2023 are analyzed. To track the structural changes that have occurred, a methodology is used that relies on the application of the integral coefficient for structural changes, and the analysis is based on official data on visits by foreigners to Bulgaria, obtained from the INFOSTAT system on the website of the National Statistical Institute. The results of the analysis can be summarized as follows:

- During the analyzed period, significant structural changes occurred both in terms of the purposes of visits and in terms of the regional dimensions of the

nationality of incoming tourists. The intensity of changes was the highest in visits for the purpose of holiday and recreation, and the lowest and with relative constancy of the ongoing processes – in visits for other purposes. These trends are observed both in terms of the total number of visits by country according to the Nomenclature on the countries for tourism statistics purposes, and in terms of intra-group structural differences in individual groups of countries, especially among the countries of the European Union and among other European countries.

- The most intense structural changes in the total number of visits are characterized by visits related to holidays and recreations. The main reasons for this are the reductions in the relative share of visits by tourists from the EU at the expense of the increase in the shares of the other groups according to the Nomenclature, but the most serious is the increase in visits by tourists from other European countries.
- The most intensive structural changes in terms of visits by tourists from the EU are visits for holiday and recreation purposes. The main reasons are the increase in the relative shares of visitors from Poland, Romania and the UK, at the expense of the decrease in holidaymakers from Germany and Greece.
- The most intensive structural changes in terms of visits by tourists from other European countries are holiday visits and recreation. The main reasons are the increase in the shares of holidaymakers from Ukraine and Turkey at the expense of the decrease in visitors from Russia.
- The most intense structural changes in terms of tourist visits from other countries are business visits. The main reasons are the increase in visits from the USA at the expense of the decrease in visits from Israel.

Conclusion

The conclusion summarizes the main results of the theoretical and empirical study of inbound tourism in Bulgaria in accordance with the defined goal, objectives and research thesis. The established patterns show that the current state, legislative regulation and the dynamics of the economic activities carried out by tourism in Bulgaria require a change in both the guidelines of the state government in terms of stimulating and promoting Bulgarian tourism, and in the priorities of society, expressed in supporting national tourism by choosing Bulgaria as the main destination for excursions and vacations, for personal and professional trips, for cultural, entertainment, wellness, etc. traditional and non-traditional types of tourism. This is achievable, but for this purpose, the appropriate socio-economic, natural-climatic and conjunctural conditions must be optimally used in combination with the results of scientific and practical-applied research.

IV. REFERENCE TO THE MORE SIGNIFICANT CONTRIBUTIONS DEVELOPED IN THE DISSERTATION

In this dissertation work, the following more important points can be highlighted **contributing moments** of a scientific and applied nature:

1. On the basis of a critical review of scientific publications in which empirical studies of tourism in Bulgaria have been carried out, it has been found that the use of statistical and econometric approaches in the analysis of ongoing processes in tourism is an exception in the scientific literature. On this basis, the relevance of the statistical research related to the use of appropriate statistical-econometric methods and models to establish regularities that will support the development of strategic decisions for the development of the industry is justified.

2. A retrospective analysis of the stages through which tourism statistics have been institutionally regulated globally and in Europe has been carried out. It is concluded that the provision of reliable statistical information for the implementation of complex and effective comparative tourism research in Bulgaria is possible through the harmonization of national tourism monitoring guidelines with a number of international and European organizations such as the UN World Tourism Organization, OECD and Eurostat.

3. The choice of the countries Hungary, Greece, Turkey and Romania is justified, with which a comparative analysis of Bulgaria has been carried out, according to indicators of inbound tourism, as well as those related to the assessment of the contribution of tourism to the gross domestic product and the place of Bulgaria on international markets has been established.

4. Using appropriate statistical and econometric methods, the dynamics and trends of the absolute indicators for the characterization of the number of visits of foreign tourists to Bulgaria are studied. By decomposing the time series of monthly data into component parts, the seasonality of foreign tourist arrivals in Bulgaria is investigated. Specific regularities in the structural dynamics of foreign tourists' visits by main country groups and by motives of the visits are identified.

5. Based on the identified patterns in the trend and seasonality of the indicators analysed, short-term forecasts with a two- or three-year horizon were developed and their confidence intervals established.

D E C L A R T I O N

for originality

by Plamena Yordanova Koleva,
full-time PhD student
Department of Statistics and Applied Mathematics
at the D. A. Tsenov Academy of Economics - Svishtov

I declare that the presented dissertation on the topic "Statistical study of tourism in Bulgaria" for the award of the educational and scientific degree "Doctor" in the scientific specialty "Statistics and Demography" is an original author's work. It contains results obtained during scientific research conducted by me. The results that have been obtained, described and/or published by other scientists are duly cited in the text and included in the bibliography.

This dissertation has not been applied for the acquisition of a scientific degree at another higher school or scientific institute.

31.01.2025. Declarant: (signed)
Svishtov /Plamena Koleva/

LIST OF PUBLICATIONS ON THE TOPIC OF THE DISSERTATION THESIS

I. Articles

1. **Koleva, P.** (2023). Statistical analysis of the dynamics of inbound tourism in Bulgaria. Annual Almanac "Research of PhD Students", book 18, volume XV, 2022, pp. 396-410. Svishtov, D. A. Tsenov Academy of Economics, ISSN 1313-6542.
2. **Koleva, P.** (2024). Normative regulation of tourism statistics. Annual Almanac "Research of PhD Students", book 19, volume XVI, 2023, pp. 445-463. Svishtov, D. A. Tsenov Academy of Economics, ISSN 1313-6542.

II. Reports

1. Petkov, P. **& Koleva, P.** (2023). Statistical analysis of structural changes and differences in visits of foreigners to Bulgaria. Jubilee international scientific and practical conference "Challenges to finance and economic accountability in the conditions of multiple crises. Svishtov, 09-10.11.2023, p. 561-567, ISBN 978-954-23-2427-0.
2. Petkov, P. **& Koleva, P.** (2024). Statistical analysis of seasonal fluctuations in visits of Bulgarian citizens abroad. International scientific conference on "Problems and challenges facing economic science and education in the 21st century", dedicated to 80 years of the Union of Scientists in Bulgaria. Svishtov, 22.11. 2024, p.247-256, ISBN 978-954-23-2522-2.