

CURRENT CHALLENGES IN TOURISM STATISTICS: TOURISM ECONOMIC IMPORTANCE MEASUREMENT

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Abstract

In order to understand the contribution of tourism to society and persuade governments and policy makers to take tourism seriously, measurement of its economic importance, its direct, indirect, and induced impact on jobs, GDP, trade, and investments on a global scale is needed. Tourism is nowadays characterised by availability of enormous information technologies and statistical software focusing on quantification of tourism impact; however quantitative research in tourism faces numerous inaccuracies. The aim of this paper is to monitor the current state of tourism statistics on the national and international level, its pros and cons and to propose and discuss new challenges of tourism quantification. The paper gives a valuable insight into the methodology of collecting and processing data, the documents of the Slovak Statistical Office, Tourism Satellite Account, manuals from the WTTC and UNWTO. It critically analyses these documents and gives recommendations for improving the exactness of the measurement.

Key words: *collecting data, tourism impacts, tourism statistics, exactness of measurement.*

1. Introduction

Tourism, in a statistical context, refers to the activity of visitors taking a trip to a destination outside their usual environment, for less than a year. It can be for any main purpose, including business, leisure or other personal reasons other than to be employed by a resident person, household or enterprise in the place visited.

Tourism is associated with several economic functions, in terms of its economic activity. In order to reach an important position in the economy of the destination, tourism must constantly respond to changing attributes of demand. Several indicators of tourism economic impact can be found in the literature. According to Vanhove (2005), Goeldner and Ritchie (2006), Palatková (2011) and Gúčík (2011), the most frequently used indicators are number of domestic and foreign visitors, visitor exports, government and domestic spending on tourism, direct and total contribution of tourism to gross domestic product (GDP) and employment and capital investments in tourism.

The economic effects of tourism can be divided into direct, indirect and induced (WTTC, 2014). Direct effects are generated by industries that deal directly with tourists, including hotels, travel agents, airlines and other passenger transport services, as well as the activities of restaurant and leisure industries that deal directly with tourists. Indirect effects can be characterized by an increase in sales in supplier industries. It is thus an expenditure which has been obtained primarily from visitors, but was used to purchase goods and services in other

sectors. Induced effect is created by spending of those who are directly or indirectly employed in tourism.

The aim of the paper is to monitor the current state of the tourism statistics on the national and international level, its pros and cons and to propose and discuss new challenges of tourism quantification. The paper helps to understand the inaccuracies in tourism statistics and gives a valuable insight into the methodology of collecting and processing data on the national and international level.

2. Literature Review

Tourism practitioners and academics have to constantly defend its meaning, economic importance, direct, indirect and induced impact on jobs, GDP, trade, and investment and persuade governments and policy makers to take tourism seriously. Therefore the measurement of its impact and its quantitative research is needed.

Measuring the economic impacts of tourism is not easy, because there are no tools to count the exact number of domestic and foreign visitors, tourists do not spend their money only in tourism businesses and the research faces numerous inaccuracies.

On the national level, the method for collecting and presenting tourism demand and its impact is called Tourism Satellite Account (TSA). It is based on principles and structure of the internationally adopted System of National Accounts (SNA). The TSA comprises a set of interrelated tables that show the size and distribution of the different forms of tourism impact on national economy (UNWTO, 2008). Due to lack of information and the increasing demand for regional tourism statistics regional TSA have been introduced in several countries. For example, Statistical office in Austria developed regional satellite accounts for three regions at NUTS 2 - Vienna, Upper Austria, Lower Austria, which help to more accurately quantify the effects of tourism on a regional scale (Laimer, 2012). Regional tourism satellite accounts were introduced also in Denmark in 2005 (Zhang and Billing, 2009). Frechtling (2010) points to the problems associated with creating these regional satellite accounts. One of the problems is the lack of a conceptual framework at the regional level comparable to the national accounts. He also shows the problem that not all tourism activities can be explored on a regional scale (e. g. export and import related to tourism).

However as Frechtling (2013) lately adds, TSA is not capable to generate all of the economic impact variables that policy-makers may need, therefore the macroeconomic models are used. These models may include (Neo)keynesian models (Cooper et al., 1993; Pao, 2005), Money Generation models (Steynes, 1999), Input-output model (Fletcher, 1989, West and Gamage, 2001; Cai et al., 2006), or Computable General Equilibrium model (Dweyer et al., 2004).

The (Neo)Keynesian models are based on disaggregation of gross domestic product on expenditure components of aggregate demand (Bod'á, 2006). Money generation model is a simple fill-in-form for generating economic impacts (Steynes, 1999). The average spending, number of visits and aggregate multipliers are entered on a simple worksheet. Total estimates of the sales, income, employment, and tax effects of visitor spending are generated as a result.

The input-output (I-O) model, is a mathematical model that describes the flow of money between sectors of regional or national economy. Input-output analysis is concerned with interrelations arising from production; the main function of inter-industry accounts is to trace the flow of goods and services from one production sector to another. The model presents the total amount of intermediate output required throughout the economy for any amount of final consumption of a given industry's output. The sum of these outputs throughout the economy over and above the direct output to meet tourism demand is called indirect effect of the demand and is one of two types of secondary impact. To analyse the implications of tourism

consumption in a country, the vector of tourism expenditure by industry is provided based on TSA tables (Frechtling, 2013). Moreover, various multipliers can be computed by dividing the total transactions, output, added value, income or employment generated by the initial amount of tourism demand (Shaffer et al., 2004).

Real world features demand and supply that affect the economic impacts of shocks to tourism expenditure can only properly be taken into account using Computable General Equilibrium models. CGE models have their historical origins in input-output methodology, but were developed to overcome the shortcomings of I-O models. Based on neoclassical economic theory, CGE models capture a wider set of economic impacts derived from a shock or the implementation of a specific policy reform. They allow for the inclusion of the constraints absent from I-O calculations and allow flexible prices and wages. They include more general specifications of the behaviour of consumers, producers, governments and investors than other types of models (Dixon and Rimmer, 2002; Blake et al, 2006).

3. Material and Methods

The aim of the paper is to monitor the current state of the tourism statistics on the national level and international, its pros and cons and to propose and discuss new challenges of tourism quantification. The article compares tools and models mostly used by national and international organizations, as well as their shortcomings. They include Tourism Satellite Accounts, Input-Output model and the Computable General Equilibrium models.

In order to meet the aim of the paper secondary data are used. These include information from Slovak Statistical office, internal data from destination management organization and data from World Travel and Tourism Council. The information were processed by content analysis, which uses secondary material to objective and systematic description of a given subject.

4. Results and Discussion

Tourism, as many other disciplines, relies heavily on data of all sorts and the quantitative treatment of collected data is in many ways very helpful not only for tourism academics, but also for the practitioners. There are three main users of these data. The first one is the public institutions such as decisive sphere and academic institutions, who use the data to conduct the research and influence the tourism policy. The second user of the data are destination management organizations, whose aim is to conduct marketing research and thus to focus on the right marketing segment. The third main user of tourism data are private institutions, such as accommodation and catering facilities, touroperators. They use the data in order to benchmark with their competitors a thus to reach a competitive position on tourism market. In order to collect and process tourism data several tools and economic models are used nowadays by many national and international institutions.

4.1. Data Collection and Tourism Statistics on National and International Level

Nowadays there are different methods of collecting data and various documents published about tourism statistics by national and international institutions. The national level is represented by national statistical offices, while on the international level the article focuses on the statistical office of the European Union – Eurostat and nongovernmental organizations – World Tourism Organization (UNWTO) and World Travel and Tourism Council (WTTC).

The data collection and tourism statistics on the national level in Slovakia is done by Slovak Statistical Office. It compiles the System of tourism statistics of the Slovak Republic,

which is in line with the Regulation 692/2011 of the EU concerning European statistics on tourism. This system consists of data gathered from accommodation facilities, touroperators, sample statistical questioning of households and foreign visitors.

Each public accommodation facility has a duty to provide monthly data on number of hosts, their length of stay and capacity of the facility. Moreover quarterly it provides information on revenues and number of employees, as well as their nominal wages. This kind of method does not take into account same-day visitors, and what is more, if a host is accommodated during his/ her trip in more accommodation facilities, each time he/ she is counted as a new visitor. Therefore the data are not accurate and the average length of stay is minimized.

The data from touroperators are aimed at inbound and outbound foreign tourism organized by Slovak touroperators. The data include number of visitors from foreign countries which trip was organized by Slovak incoming touroperator, as well as number of national visitors that booked their foreign trip in some touroperator. Moreover the touroperators provide information on their revenues and employees. The limitations of this kind of data collection includes the fact that only organized tourism is taken into account. Those visitors that organize their trip individually are not present in the data.

In order to minimize this limitation the sample statistical questioning is used. The questioning is quarterly focused on households and their number and characteristics of trips (e.g. motive, destination, length of stay, consumption) or is focused on foreign visitors. The questioning of foreign visitors is done on state border crossings where each quarter at least 1,400 visitors are examined, or is done by tourist information centers in destinations. However this kind of data collection is very time consuming and expensive. The presence of the Slovak Republic in the Schengen area allows the free movement of persons, which impede the questioning on national borders and minimize its effectiveness.

In addition to the Statistical office, the National Bank of Slovakia publishes the information about the impact of tourism on the balance of payment.

The tourism statistics conducted for the whole European Union is not only used to monitor the EU's tourism policies but also to monitor its regional and sustainable development policies. This legal basis requires EU Member States to provide a regular set of comparable tourism statistics based on the Regulation 692/2011. The information from national statistical offices relating to capacity and occupancy of tourist accommodation and statistics relating to tourism demand are proceed and published by the Eurostat. They are published in the databases or as a specific publications, e.g. Tourism Statistics Pocketbook, Panorama on Tourism, Eurostat Regional Yearbook. The data are also analysed by the sociodemographic characteristics of the tourist (sex, age, educational attainment level, household income and activity status). The published data from include:

- structural business statistics and short-term business statistics,
- data on employment in the tourism accommodation sector from the labour force survey, analysed by working time (full/part-time), working status, age, level of education, sex, permanency and seniority of work with the same employer (annual and quarterly data),
- data on personal travel receipts and expenditure from the balance of payments,
- transport statistics (for example, air passenger transport).

The World Tourism Organization (UNWTO) has implemented The Statistics and Tourism Satellite Account Programme, which is committed to developing tourism measurement for furthering knowledge of the sector, monitoring progress, evaluating impact, promoting results-focused management, and highlighting strategic issues for policy objectives. The programme works towards advancing the methodological frameworks for measuring tourism and expanding its analytical potential, designs practical guidance for their implementation in

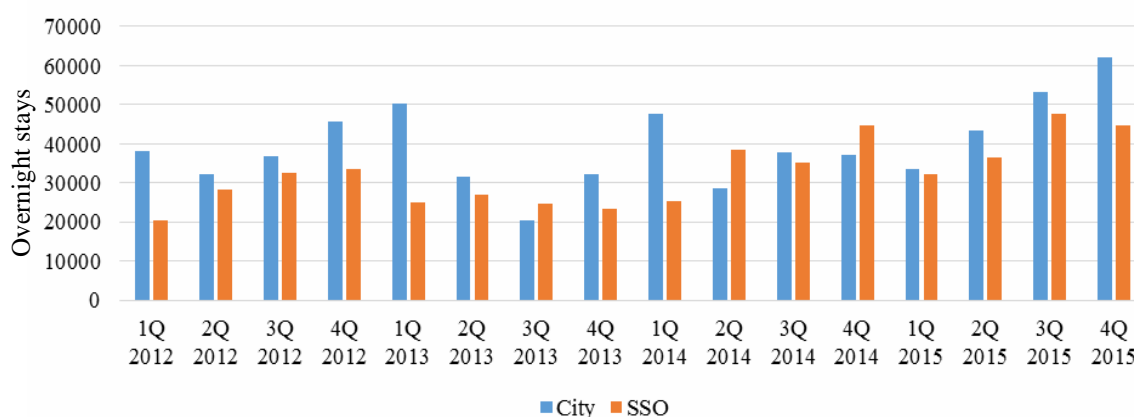
countries, supports statistical strengthening in countries through capacity building, and compiles and disseminates tourism statistics of countries all over the world. The statistical outputs are published in official documents, such as Tourism Highlights, Compendium of Tourism Statistics and Yearbook of Tourism statistics. The getting and processing of data is regulated by the manuals and directions explained in the guidebooks¹.

Because of its accessibility and clarity, the most popular and used tourism statistics is published by the World Travel and Tourism Council (WTTC). It is an unofficial Tourism Satellite Account, which is based on information from national accounts, macroeconomic research, forecasting and modelling, which is fundamentally different from the official accounts. It is available for everyone on the official webpage of WTTC, from where the creating and downloading of various data, tables and graphs is possible.

4.2. Economic Tools and Models Used for Tourism Research

All of the European Union countries have a duty to establish official tourism satellite account at national level according to the principles of UN Recommended Methodological Framework 2008. The World Tourism Organization (UNWTO) collects data on tourism and establishes programs to support tourism statistics on national level. National statistical offices use TSA to analyze the impacts of tourism on national economy. TSA is therefore the baseline for formulating tourism policy, regional development and marketing planning. The national data collection is based on the statistics of accommodation facilities, touroperators and sample statistical questioning. These data are published every year and are a base for the construction of Tourism Satellite Account, which however, is published with a three-year delay. Furthermore the data are not always accurate and comprehensive. It can be demonstrated on the example of Slovak Statistical Office and city Trnava, where there is a great discrepancy between the data on overnight stays from statistical office based on reports from accommodation facilities and own research of the city based on accommodation taxes (see Figure 1).

Figure 1: The comparison of number of overnight stays based on the data from Slovak Statistical Office (SSO) and data based on accommodation taxes from the city



Source: the authors based on Slovak Statistical Office and internal document of DMO Trnava.

The limits of TSA also includes the possibility to capture only direct impacts of tourism, the secondary effects are not captured. For estimating the secondary impacts it is important to

¹ Such as "Methodological notes to the tourism statistics database" published by the UNWTO and available at http://cf.cdn.unwto.org/sites/all/files/pdf/methodological_notes_2016_en.pdf (accessed 01-10-2016).

design and implement economic models. Several models can be used, however the most used in tourism praxis are the Input-Output model, Social Accounting Matrix or Computable General Equilibrium. Moreover the TSA is based on the ex post analysis, which creates the opportunities to other models to use ex ante analysis.

The Input-Output model was developed more than 70 years ago, but its usefulness for tourism statistics has been acknowledged only few years ago. It was developed to assess the secondary impact of shocks to a national economy. The I-O model is based on the Input-Output table constructed from the supply and use tables from a country's system of national accounts.

Based on the I-O model, unofficial TSA is produced by World Travel and Tourism Council (WTTC). When direct measurement is not possible, it uses the input-output model. It works with a sample of 181 countries and time series from the 1980's. Although the data are not comparable with official TSA (Table 1), they are useful to compare the economic impacts of tourism in several countries and to find out the change in some economic indicator.

Table 1: Comparison of Direct contribution of tourism to GDP of Slovakia measured by TSA and I-O model used by WTTC in %

Tool/ Year	2005	2006	2007	2008	2009	2010	2011	2012
TSA	3.29	3.04	3.08	2.97	2.66	2.53	2.65	2.96
I-O model	1.78	1.96	2.26	2.48	2.60	2.35	2.21	2.19

Source: Statistical Office of the Slovak Republic, WTTC.

Although the I-O model is capable of simulating the effects of the shock to an economy, this ability is not used in tourism statistics. For tourism statistics the ex post analysis of economic impacts is suitable, because it provides accurate estimation of tourism economic impacts. However the I-O model has also some limitations as it does not provide disaggregated information below the industry level. To overcome this limitation, Social Accounting Matrices should be used. Social Accounting Matrices (SAM) enriches the I-O analysis focusing on disaggregated information. The data are enriched also by survey information in order to produce information on income class, sex, type of visitor etc. Unfortunately there is no commonly recognized structure of SAM, therefore their limitation is limited international comparison of the indicators.

The last model used in macroeconomic tourism statistics is Computable General Equilibrium (CGE) model, which is based on SAM. This model produces ex ante analysis of how national economy can adjust to a shock, such as increased tourism expenditures caused by a major event, or higher tourism taxes, higher petroleum prices, higher wage rates in tourism sector etc. It assumes tourism market as competitive with freely moving of prices to equilibrate supply and demand, firms maximizing prices and consumer maximizing their utility. This model could have been used for example in Slovakia before the adoption of the currency Euro to measure the economic effects and also the effects on tourism. Or it is possible to use the model to predict how the Slovak ski destinations will react to the climatic changes. Moreover it can be used to persuade decisive sector to cut VAT rate on accommodation as in Slovakia is one of the highest in the EU. The similar situation was done in UK (Table 2).

The limitations of the model is the necessity of massive amount of input data that are difficult to collect. Moreover the model uses assumptions based on certain economists' view that can be disputable.

Table 2: The example on the use of CGE model to analyse the reduction of VAT in tourism

	Scenario 1	Scenario 2	VAT
Discounted GDP over 9 years	19 271	79 430	28 337
Discounted fiscal impact over 9 years	-3 493	-18 150	-17 830
Fiscal impact to GDP ratio	-0.18	-0.23	-0.63

Scenario 1 – reduction in VAT on accommodation and visitor attraction to 5 %

Scenario 2 – reduction in VAT on accommodation, food and beverage services and visitor attraction to 5 %

VAT – a 1 pence reduction in the standard VAT rate

Source: adapted from Blake (2012).

In order to compare the economic tools and models used for tourism statistics, Table 3 indicates the methods that are used to analyse the most used economic indicators.

Table 3: The comparison of presented tools and models used in tourism statistics

Economic indicator	Scope	Aggregation	Time	Method
Number of domestic and foreign visitors	Direct	Sectors	Ex post	TSA
Visitor exports	Direct	Sectors	Ex post	TSA
Domestic spending on tourism	Direct, indirect	Sub sectors (households)		SAM
Government spending on tourism	Direct, indirect	Sectors	Ex post	I-O
Direct contribution to GDP	Direct	Sectors	Ex post	TSA
Total contribution to GDP	Secondary	Sectors	Ex post	I-O
Direct contribution to employment	Direct	Sectors	Ex post	TSA
Total contribution to employment	Secondary	Sectors	Ex post	I-O
Capital investment in tourism	Direct, indirect	Sub sectors (industries)	Ex post	SAM
Tourism economic impact	Direct, indirect	Sub sectors (industries, households, ...)	Ex ante	CGE

Source: the authors.

5. Conclusion

From the above mentioned data collection and tourism statistics on the national and international level, as well as tools and models used in tourism statistics several problems arise. One of these problems is the exact data collection of visitors and their consumption. The use of big data can be a partial solution. The very high potential for monitoring of tourists and their flows lies in the mobile positioning data that track the location coordinates of a mobile phone in the cellular network. The positioning data can be tracked actively, using tracking system, or passively, when the data are stored in the databases of mobile network operators. For tourism statistics, the passive way is more acceptable as the data are stored each time a person uses the mobile phone (call, messaging, using the mobile internet). This method can provide many new indicators and breakdowns. The indicators include number of unique visitors, number of visits in a given destination exact number of night spent in a destination. These data can be classified by country of origin, according to time (day, week, month) or space (administrative units), duration of the stay (same-day visitors, overnight stays), destination (primary destination, secondary destination, transit) etc. However because of the privacy, the processing have to guarantee anonymity when the visitor cannot be directly or indirectly identified. The feasibility study on the use of mobile positioning data for tourism

statistics was elaborated by the European Commission² leading to the conclusion that this method is a valuable supplementary source for the official tourism indicators defined by Regulation 692/2011 of the EU.

To get more exact data on tourism expenditure, the payment card data should be used. These data are stored in a bank each time a customer uses the point of sale (POS) terminal or ATM extraction with a payment card. The biggest advantage is that POS and ATM can be geolocalized and thus the expenditure can be classified according to tourism destination and the bought goods. The tourism consumption can be also classified according to country of residence of the visitor, the holiday place, consumed estate or other visitor characteristics, as each bank has a detailed information on their clients. However, similar privacy regulations have to be used as in dealing with mobile positioning data. This kind of getting information is focused only on those, which pay cashless and does not consider people using cash.

Other information about tourist behaviour can be collected using the internet by extracting information from the websites (web scraping). This web scraping can be done on search engines, internet distribution systems and online travel agencies (e.g. Booking.com, Expedia), or social media. However the information observed and search on internet do not have to be consistent with the consumption.

Taking into account the tools and models used in tourism statistics, more research should be done to evaluate their shortcomings. The models give a valuable information of macroeconomic indicators, however the input data are difficult to collect. The methodology for the models should be nationally harmonized (as for the TSA) in order to produce comparable data.

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² See the European Commission report " Feasibility study on the use of mobile positioning data for tourism statistics" available at <http://ec.europa.eu/eurostat/documents/747990/6225717/MP-Consolidated-report.pdf> (accessed 01-10-2016).

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