

Dušek, Radim; Štumpf, Petr; Vojtko, Viktor

## Article

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## Geomarketing - Tool for Consumer Spending Estimation in the Czech Tourism & Hospitality Market

Radim Dušek, Petr Štumpf<sup>†</sup>, Viktor Vojtko

*University of South Bohemia, Faculty of Economics, Department of Trade and Tourism, Studentská 13, 370 05 České Budějovice, Czech Republic*

### ABSTRACT

This paper deals with a source market size estimation tool that is based on a combination of geomarketing information and consumer spending datasets. We have decided to apply a proposed estimation method on three consumption expenditure groups that are related to the tourism and hospitality industry in the Czech Republic. The geographic and consumer spending data sets for the period 2011 - 2016 were drawn from publicly available sources. With the use of GIS software, this method allowed us to estimate and graphically display consumer spending on recreation and culture; restaurants and hotels; and transport in 2016 at the level of Czech districts, as well as the average annual growth rate during the period 2011 - 2016. This paper describes the Czech tourism and hospitality market from its size and growth point of view. It shows the trends in expenditures for hospitality and tourism services, explain the purchasing power in Czech regions and districts and predict the development for next few years. The results obtained by this low-cost method can be easily used by enterprises from the Czech Republic within domestic tourism, as well as by the foreign companies wanting to attract Czech visitors.

*Keywords: Geomarketing, SMEs, Consumer Behaviour, Tourism, Hospitality, GIS software*

## 1. Introduction

The tourism and hospitality market is specific from the viewpoint of consumer behaviour. The spending of visitors in tourism destinations is divided among different companies in various branches that include many large international enterprises, but more often, small and medium sized enterprises (SMEs). Smaller service and retail providers have to face many limitations in their marketing and management implementation

that lead to significant disadvantages in comparison to bigger competitors. That is why it would be beneficial for SMEs' managers to use simple and low-cost methods and tools that can help to estimate their source markets size and growth, from the viewpoint of spending of households in the source markets.

The aim of this paper is to present a method based on geomarketing information and consumer spending data sets and calculate estimated annual consumer spending in selected source markets as well as their average annual growth rates by applying this method. Then show the results graphically and explain crucial findings and estimated future trends in the Czech tourism and hospitality market. For this research, we

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<sup>†</sup> Petr Štumpf

E-mail: [pstumpf@ef.jcu.cz](mailto:pstumpf@ef.jcu.cz)

have decided to focus our estimation method primarily on consumption expenditure groups that are related to tourism and hospitality industry:

- a) recreation and culture spending;
- b) spending on restaurants and hotels; and
- c) transport spending.

These data can be used as an assumption for more successful management and marketing decision-making process in the tourism and hospitality industry. This tool can be practically used by managers and marketers of tourism and hospitality companies to efficiently estimate their source markets. This tool enables the identification of new market opportunities in the Czech Republic and describes the Czech tourism and hospitality market from its size and growth point of view. It shows the trends in expenditures for hospitality and tourism services and explain the purchasing power in Czech regions and districts. The results can be easily used by companies from Czech tourism destinations domestically, as well as by the foreign companies, wanting to attract Czech visitors.

## II. Literature Review

The tourism and hospitality industry is one of the most progressive sectors of the global economy, as well as many national and regional economies. The tourism and hospitality market and expenditures for tourism and hospitality services have grown dramatically over the last few decades. The tourism and hospitality sector is pulled by a bundle of competitive advantages, which are the cause of a tourism development. Climate, landscape, historical and cultural attractions can affect not only the tourism development of tourism destination, but also job creation and the entrepreneurship in this sector of economy (Ritchie, 2003; Mazhenova, Choi & Chung, 2016). Woodside & Martin (2008) highlight the importance of tourism demand modelling and forecasting for competitiveness of tourism and hospitality businesses. These authors claim that the success of

tourism and hospitality companies is dependent on tourism demand, which is thus the key determinant of profitability of the businesses in this sector. An accurate estimation and prediction of tourism demand is essential for efficient planning in tourism and hospitality businesses, even though it causes partial instability of their tourism product. Despite the importance of mentioned activities, Luštický & Bednářová (2018) argue that development of a particular destination should not be missed out by destination management organization.

### A. Tourism and hospitality businesses in the tourism market

There are several types of businesses, from a size perspective, that we could identify in the tourism market. It is possible to find global strategic alliances, international groups, or national chains and businesses (Crotts, Buhalis & March, 2000; Kreilkamp, 2001), but the infinite number of SMEs is considered as the “backbone” of the private sector in tourism and hospitality. Furthermore, micro businesses with less than ten employees are especially dominant (Jones & Haven-Tang, 2005; Moutinho, 2000; Thomas, Shaw & Page, 2011) and highly heterogeneous. Nevertheless, the huge international companies, groups and chains still determine the pace and standards, while most of the SMEs struggle to keep profitability or even survival.

As we mentioned, many of companies in tourism and hospitality industry have an SME structure due to customer preferences and their need for personalised services in this sector, however, it is more difficult for SMEs to be successful in markets where competition is aggressive (Keller, 2004). Because of limited capital and human resources, SMEs in the tourism and hospitality industry are typically specialized in a narrow range of services or products. This narrow specialization is based primarily on a limited range of capabilities that are directly related to the ability to provide a product or service they understand. In this economy sector, SMEs typically make use of informal marketing management information systems, but they mainly

concentrate only on internal and immediate operating data. The more important wider market intelligence is underutilised owing mainly to the resource limitation of these SMEs (Pugna et al., 2016; Wood, 2001). In such conditions, their main focus is on working practices, with managers often lacking strategic and tactical managerial skills (Pletnev & Barkhatov, 2016).

Another difference between enterprise size is also in marketing and management strategies implementation which is highly dependent on the marketing knowledge of entrepreneurs or small business owners who tend to be generalists rather than specialists (Hogarth-Scott et al., 1996) and so they have a limited range of knowledge, capabilities and resources in comparison with bigger companies (Meulenbergh & Verhees, 2004). Hill (2001), for instance, highlights the intuitive nature of marketing management in SMEs based more on specific problems and implementation of marketing activities without proper planning. In fact, it leads to significant disadvantages that service providers and small retailers have to face in comparison to bigger companies. According to Barnett (1988), local market share and demand forecasting will not ensure SMEs success, but without it, strategic decisions are based on unsubstantiated and often wrong assumptions. Therefore, according to Musil (2018), these SMEs need professionals who require suitable data. So it should be beneficial to develop methods and tools that are focused on finding information to support managerial decision-making processes in the field of tourism and hospitality business.

## B. Geomarketing as a support for marketing decision-making

Geomarketing is a discipline that uses geographic information in the process of planning and implementation of marketing activities (Cross, Belich & Rudelius, 1990; Tynan & Drayton, 1987). Many tourism SMEs do not operate on scale of a whole country scale. To be able to respect this locality aspect, geomarketing tools and methods combined with internet-based household sales data collection could be used to

visualise and estimate local market size (Touzani & Van Buskirk, 2016).

Geomarketing can be applied in different aspects, such as marketing communication, pricing, segmentation of the market, geographical targeting as well as tourism planning (Fischer & Staufer-Steinnocher, 2001; Mcadam, 1999). The analysis of geomarketing data uses a huge data pool, such as geographic areas and topography. It also analyzes demographic information such as age, gender, annual income and lifestyle. This information can help users develop successful communication campaigns to reach specific marketing goals. One of the common activities in geomarketing is segmentation of the market (Bloom, 2005). In combination with the historical sales datasets and demographic information, geomarketing can be used to estimate and visualise local market size and its structure in Geographic Information System (GIS) software (Touzani & Van Buskirk, 2016; Wang, Fan & Gong, 2018). According to Mcadam (1999, p. 78), a GIS can be defined as a “relational database capable of manipulating both spatial data (in the form of digital maps) and attribute data (comprising data sets in the form of alpha-numerical records)”.

The main advantage of using geomarketing tools is that huge datasets are available (many of them free of charge) and they can be pre-processed by specialists. A GIS software allows extract and use various sets of information from a map and it is able to show a large amount of tourism information that is always up to date (Shyti & Kushi, 2012). Additionally, results are visually appealing and easy to obtain and understand. These factors should help in their straightforward application in marketing decision-making by tourism and hospitality SMEs.

## III. Methods

Firstly we obtained a data set about average consumer spending from the Czech Statistical Office during the period 2011 - 2016 (ČSÚ, 2017) as well as geographic

data with the lowest level of official territorial division in the Czech Republic from the State Administration of Land Surveying and Cadastre (ČÚZK, 2017). The comparable consumer spending data set for 2017 is not available due to a change in the methodology for measuring total consumer spending by Czech Statistical Office.

As the data about average consumer spending were on the level of eight cohesion regions (NUTS2), we had to firstly decompose them to the level of 77 individual districts. This was found to be rather problematic because not enough detailed data about the relationships between district size, or other characteristic and consumer spending, or income, were identified. The only available relevant figures for the same period of time found from Eurostat (2018) suggested that there are no big differences between smaller towns and rural areas inhabitants in their average income and the only difference was for big cities, which in our case was only Prague. As Prague was already a separate NUTS2 region in our dataset, it was considered reasonable to use the average value of consumers for the whole NUTS2 region also at the level of individual districts in that given NUTS2 region.

The next step was to combine the obtained data set on total consumer spending as well as the spending in three individual consumption expenditure groups that are related to tourism and hospitality (recreation and culture spending; spending on restaurants and hotels; transport spending) with geographic and demographic data of 77 Czech individual districts to estimate the local consumer spending, as well as the average annual consumer spending growth in the 2011 – 2016 period with the following formulas:

$$CS_{D,y} = AS_{NUTS2,y} \times I_{D,y} \quad (1)$$

where:

- $CS$  local consumer spending
- $D$  individual district
- $Y$  year
- $AS$  average consumer spending
- $NUTS2$  individual district's NUTS2 region

$I$  number of inhabitants

$$CSG_D = \sqrt[5]{\frac{CS_{D,2016}}{CS_{D,2011}}} - 1 \quad (2)$$

where:

$CSG$  average annual consumer spending growth

The results were imported into QGIS, a free and open-source cross-platform desktop geographic information system software tool. QGIS allowed us to generate maps with estimated consumer spending (in Czech crowns – CZK) in particular consumption expenditure groups and their share (in %) at the Czech districts and cohesion regions level. However, before maps were created, we have used Pearson's correlation test to evaluate correlation between analyzed individual consumption expenditure groups.

## IV. Results

### A. Tourism and hospitality consumer spending during the 2011 – 2016 period

The first part of this chapter is based on the total consumer spending data set from the Czech Statistical Office and it is focused on tourism and hospitality consumer spending over the specific period in the Czech Republic. Figure 1 illustrates annual consumer spending in CZK per person in three selected consumption expenditure groups that are related to tourism and hospitality in the 2011 – 2016 period: recreation and culture spending; spending on restaurants and hotels; and transport spending.

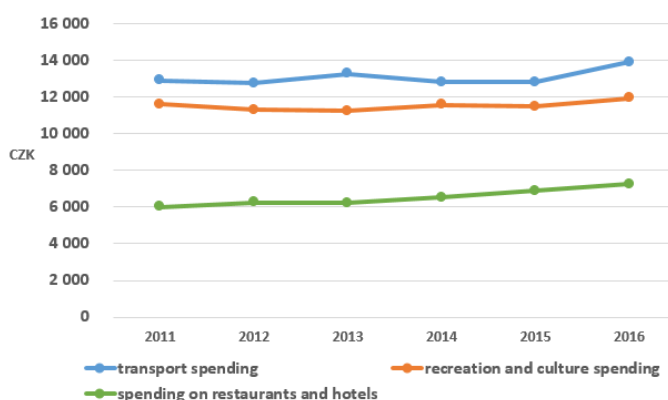
The results show that spending on hotels and restaurants increased gradually during the analysed period, while there are no significant consumption fluctuations in the other two categories. However, during the examined period, all analysed consumption expenditure groups reached their peak in 2016.

To answer the question of how high the share of the total consumer spending over the period from 2011

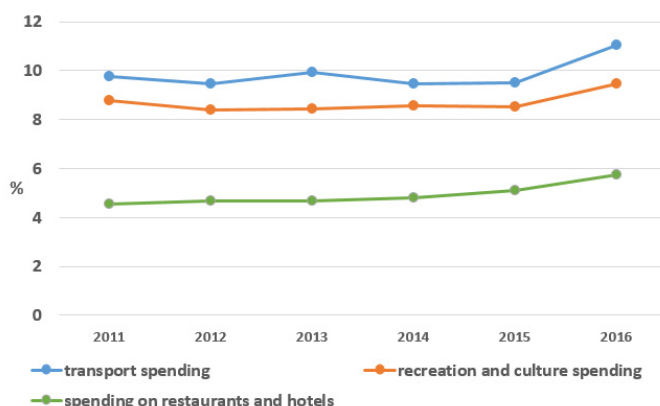
to 2016 was for the three consumption expenditure groups shown at Figure 1, we calculated the annual share values for those years. However, as shown in Figure 2, these consumption expenditure groups do not contribute much to the total annual consumer spending during this period. This is natural and to be expected, because vacations, travelling and recreation do not typically comprise daily consumption activities.

The smallest share of total spending was on restaurants and hotels (4.5% to 5.7%), while the shares of the other two consumption expenditure groups were approximately double of that: recreation and culture (8.4% to 9.5%); transport (9.5% to 11%). However, care should be taken in interpreting the data for these

groups of expenditures, because recreation and culture need not be necessarily connected with travelling, and transport expenditures need not to cover only tourism journeys according to its generally accepted definition, but also regular travelling for working purposes and personal travelling in the place of residence. Nevertheless, we can estimate how much are consumers ready to spend for these purposes. The share of these expenditure groups on overall expenditures of households can show us the purchasing power of the source market, because tourism is considered as a dispensable need.



**Figure 1.** Czech Republic annual spending per capita in selected consumption expenditure groups in the 2011 - 2016 period. Source: Own elaboration based on the Czech Statistical Office data (ČSÚ, 2017)



**Figure 2.** Czech Republic annual spending share (in %) per capita in selected consumption expenditure groups of the total consumer spending in the 2011 - 2016 period. Source: Own elaboration based on the Czech Statistical Office data (ČSÚ, 2017)

## B. Tourism and hospitality estimated consumer spending in 2016

This part of the results demonstrates which information is possible to obtain when available data sets are analysed with method presented in this paper and applied to create map outputs in GIS software. By applying our method to the source market that is relevant for a particular tourism and hospitality SME, we can simply estimate its size as well as average annual growth rate. The maps created show the estimated source market consumer spending in consumption expenditure groups that should be important for managerial decision making processes in tourism and hospitality enterprises located in the Czech Republic and also abroad, where Czech individuals are considered as the key, or potential, target groups.

### 1. Consumer spending on recreation, culture, restaurants and hotels

Pearson's correlation test proved a strong relation (correlation coefficient value = 0,842) between two consumption expenditure groups: (1) **spending on recreation and culture** and (2) **spending on restaurants**

**and hotels** for all six analysed years. Based on this finding, the estimates of total spending in these two expenditure groups were summed up together and results in all 77 districts of the Czech Republic are shown graphically in Figure 3. The estimated spending in billion CZK have been divided into five intervals, each with a different shade on the map, so that a darker colour means higher consumption in a specific district. The number of districts that fall into each interval is included in square brackets. An estimate of the amount of money approximately spent by the Czech residents in 2016 on recreational and culture services, package holidays and recreational and cultural items and equipment, as well as the money spent for restaurants and hotels services in each individual cohesion region is provided in Figure 3. The highest spending has been calculated in the biggest cities, namely in Prague, Brno, Olomouc or Ostrava. However, there are some interesting differences in recreation and culture spending within the Czech Republic. Residents of the central, northern and eastern parts of the country especially spent considerably more money on recreation, culture, restaurants and hotels than, for example, people living in the southwest

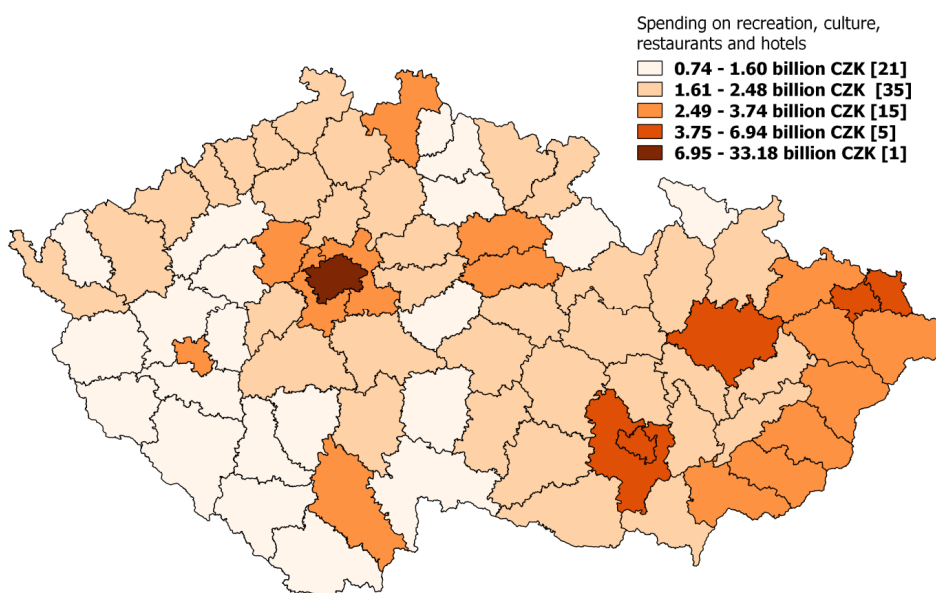


Figure 3. Czech Republic districts' estimated total spending on recreation, culture, restaurants and hotels in 2016

districts.

As for the recreation, culture, restaurants and hotels estimated spending share of the total consumer spending for each cohesion region in 2016, as shown in Figure 4, we can conclude that Prague had the biggest share (17.7 %), followed by the Central Moravia (15.8 %) and Central Bohemia and Southeast cohesion regions (both 15.2 %).

## 2. Average annual growth rate during the period 2011 - 2016

We have calculated Czech districts' average annual growth rate to find out, in which regions the overall consumer spending on recreation, culture, restaurants and hotels has significantly increased or decreased during the period 2011 - 2016. The resulting differences between districts throughout the country can be seen in Figure 5. That is why we are able to show the trends in the Czech tourism and hospitality market.

It is obvious from Figure 5 that the most often represented average annual growth rate interval has negative value (44% of Czech districts). The recreation, culture, restaurants and hotels consumer spending annual growth rates that increased over 1 % during the analysed period, has been calculated only in

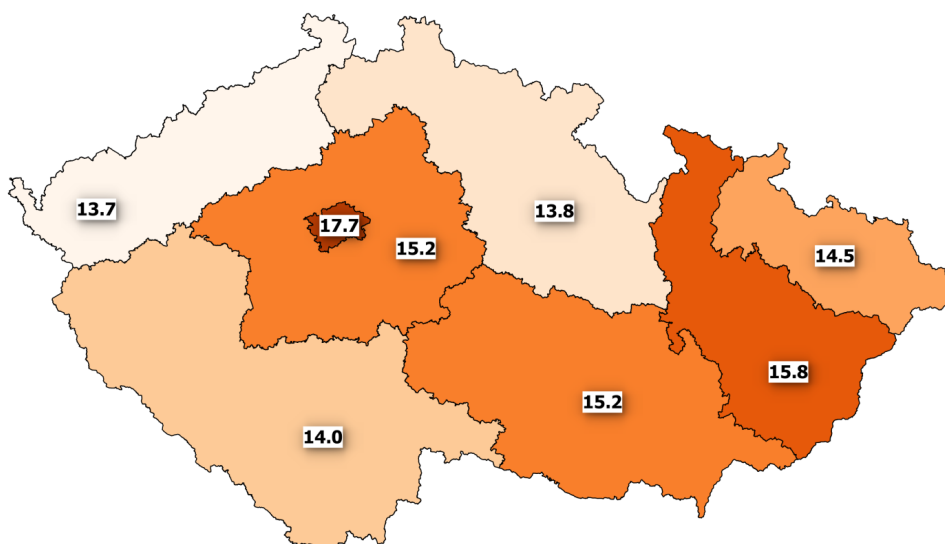
approximately 9 % of districts. Some areas with higher growth rates can be found near the capital city, while other districts are located next to the border between Czech Republic and Germany.

## 3. Consumer spending on recreation, culture, restaurants and hotels – forecast 2017-2021

The obtained average annual growth rate values for the 2011-2016 period have been used to calculate forecast of consumer spending on recreation, culture, restaurants and hotels in the 2017 - 2021 period. Figure 6 shows Czech districts' growth rate forecast for 2021 in that kind of consumer spending, calculated as the percentage difference in consumer spending between 2016 and 2021.

## 4. Transport spending

The consumption expenditure group “**transport**” contains these spending categories: purchase of vehicles; operation of personal transport equipment; and transport services. We have included this group of expenditures in our research, even though we are aware of some limitations. This expenditure group covers not only transport services (direct effects of



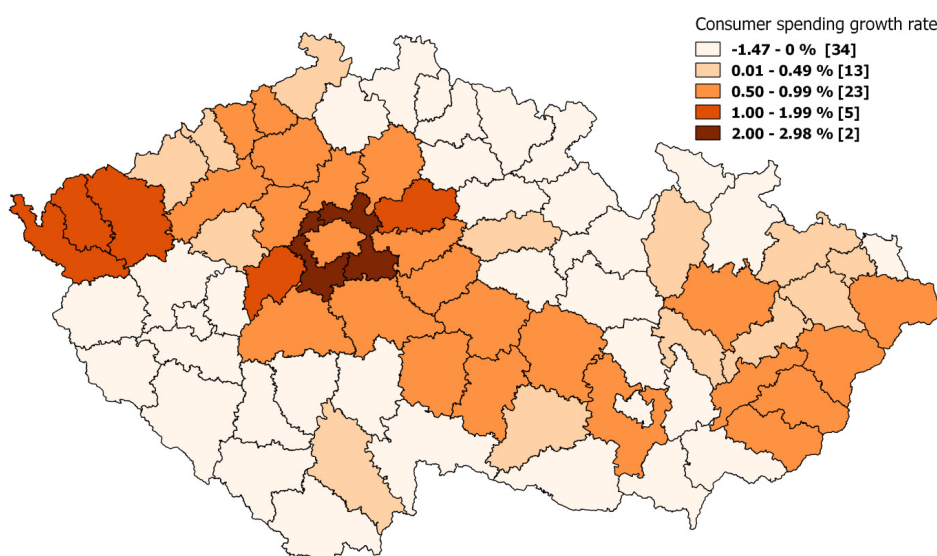
**Figure 4.** Recreation, culture, restaurants and hotels spending share (in %) of the total consumer spending by the Czech Republic cohesion regions in 2016



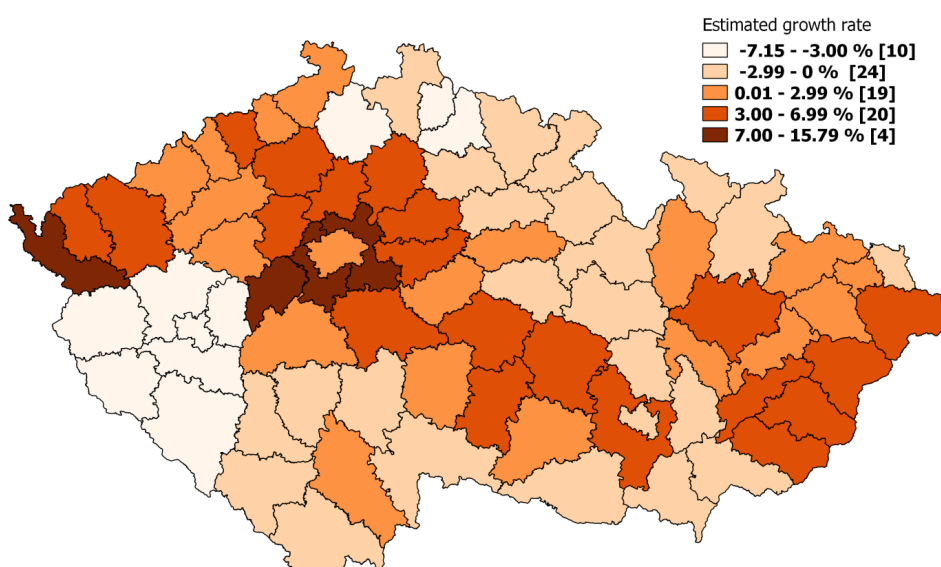
tourism sector), but also other categories, such as purchase of vehicles and operation of personal transport equipment, because of their indirect, induced and multiplication effects in tourism and hospitality sector. Also, negative correlation between transport spending and other two analysed expenditure group

has been found (correlation coefficient values = -0,362 and -0,363).

As shown in Figure 7, the highest estimated transport spending in 2016 were calculated with our method was in Prague, Brno, Ostrava and Karviná. By contrast, the total transport spending in 32.5 % of Czech



**Figure 5.** Czech Republic districts' average annual growth rate in consumer spending on recreation, culture, restaurants and hotels during the period 2011 - 2016 (in %)



**Figure 6.** Czech Republic districts' growth rate forecast for 2021 in consumer spending on recreation, culture, restaurants and hotels (in %)

districts did not exceed the amount of 1.34 billion CZK in 2016. This applies especially to the districts in the southeast part of the country.

The transport spending share (in %) of the total consumer spending for each individual Czech cohesion region in 2016 is shown in Figure 8. The highest

share (14.2 %) was calculated in the Central Bohemian Region. This particular result can be explained by large number of people from this region who travel to work in Prague, the capital city of the Czech Republic. On the other hand, the Prague inhabitants have to spend significantly more money on housing and food

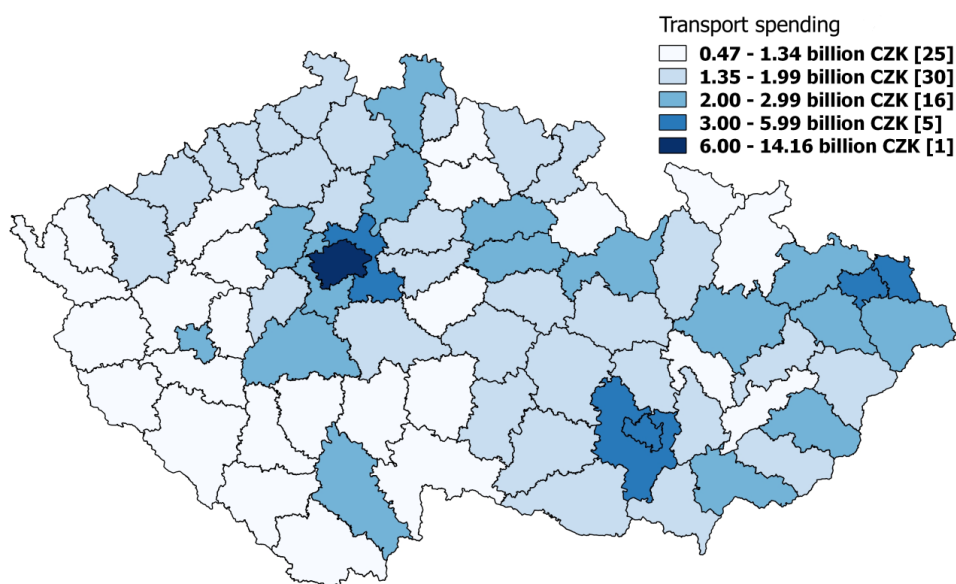


Figure 7. Czech Republic districts' estimated total transport spending in 2016

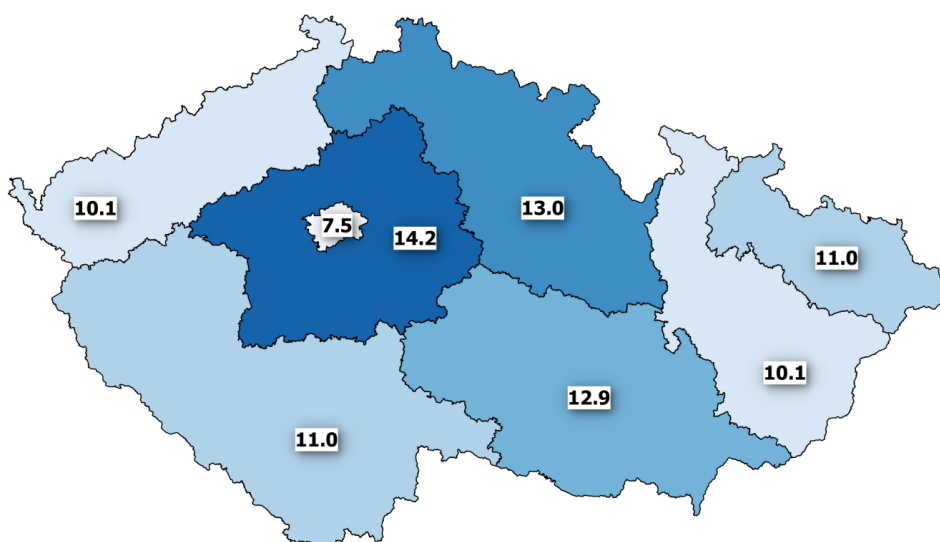


Figure 8. Transport spending share (in %) of the total consumer spending by the Czech Republic cohesion regions in 2016

compared to the rest of the country, resulting in the lowest transport spending share (7.5 %) of total consumer spending on the districts level. The lower share (10.1 %) in 2016 was also determined in two cohesion regions – Northwest and Central Moravia.

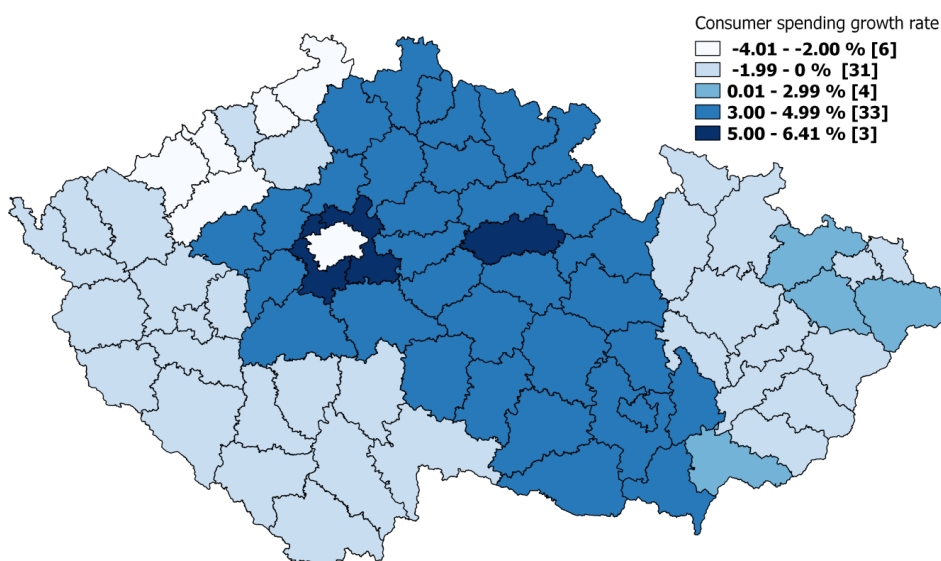
As illustrated on the final map (see Figure 9), the districts where the spending on transport had the average annual growth rate between 3 – 4.99 % during the period 2011 – 2016, are predominant. On the contrary, there are also many districts that fall within the intervals with negative values.

#### 5. Explanation of the crucial findings in the Czech tourism and hospitality market

The results point out several interesting findings. Firstly, the highest growth was recognised in the districts around the capital city of Prague, but not in Prague itself. It shows the important trend connected with urbanisation in the Czech Republic, where in the suburbs of the capital, the new and luxury residential areas are built up and the results of the forecast show that these areas go wider and wider (see Figure 5 and Figure 6). The residents with high purchasing power live there more often than in the centre of the city,

they commute to Prague for work and will be spending more for tourism and hospitality services. It can be very helpful finding for tourism and hospitality marketers, who can deal not only with the Prague as the top source market, how it is usual nowadays, but the marketing communication can be targeted also to the suburb and neighbouring districts of the capital.

Secondly, the interesting source market with high growth of expenditures for tourism and hospitality seems to be the Region of Karlovy Vary (as shown in Figure 6). This region is famous with the worldwide known “spa triangle” (Karlovy Vary, Mariánské Lázně and Františkovy Lázně). We can explain the significant growth as follows. The first reason is high purchasing power of new inhabitants in the region, where many foreigners made their investments in the region and settled there also for living. The second reason can be the wide offer of wellness and spa activities and closely connected cultural and recreational services, which are used also by the residents, who spend more for these types of services in their own region.



**Figure 9.** Czech Republic districts' average annual growth rate in consumer spending on transport during the period 2011 – 2016 (in %)

## V. Discussion

Some researchers (Silverman, 1986; Oppewal & Holyoake, 2004; Rabinovich et al., 2008) applied geomarketing methods to get information about market size and local consumer demand. They often used different theories and tools, such as the combination of historical sales data with particular geographic and demographic information with point of interest data, or other external data. As opposed to the direction of our study, these theories mainly focused on the localization and estimation of the commercial centres in specific area for retailers.

By applying our proposed method of calculating consumer spending on tourism and hospitality to the particular source markets in the Czech Republic, we can simply estimate their size and growth trend. Also, if we add data about sales for that SME it is possible to calculate its market share and, by adding specific market demographics data, we can also get its demographic profile. In this case, the information about selected source markets could include for example, the number of municipalities, the number of residents and the estimated consumer spending in tourism and hospitality consumption groups. These outcomes could also assist SMEs in identification of opportunities on the Czech market from geographic perspective and improve their targeting effort especially in planning of advertising campaigns.

Unfortunately, as the method is based on secondary data available from the Czech Statistical Office, there are some limitations as follows:

1. It is now possible to use it for the Czech Republic only;
2. Estimates do not take into consideration local specifics in consumer spending (we use NUTS2 averages per capita);
3. There is no direct involvement of incoming tourism impact, and data obtained are limited only to people living in the area being analysed;
4. The “recreation and culture” expenditure group need not be necessarily connected with travelling, and “transport” expenditures need not only cover

the journeys within tourism, but also the regular travelling for working purposes and personal travelling in the place of residence; and

5. This expenditure group “transport” covers not only transport services (as it direct effects of tourism sector), but also other categories with indirect and induced effects in the tourism and hospitality sector.

A similar approach to ours in estimating consumer demand was recently published in a study dealing with the Chinese market. It proposes a combination of the historical sales data and geomarketing methods to estimate demand in micro-geographic scale (Wang, Fan & Gong, 2018). However, until to date we are not aware of similar research that would use geomarketing methods and consumer spending data to estimate local market size and its growth trend in the Czech Republic. The results point out several interesting findings. Firstly, the highest growth was recognised in the districts around the capital city of Prague, but not in Prague itself. It can be helpful for tourism and hospitality marketers, who can deal not only with the Prague as the top source market, but the marketing communication can be targeted also to the suburb and neighbouring districts of the capital. Secondly, the interesting source market with high growth of expenditures for tourism and hospitality seems to be the Region of Karlovy Vary, because of the traditional spa area in this region.

If we consider the statements, that the SMEs represent the “backbone” of the private sector in tourism and hospitality (Jones & Haven-Tang, 2005; Moutinho, 2000; Thomas, Shaw & Page, 2011) and, furthermore, if we take into account, that the wider market intelligence of SMEs collides with the resource limitation of SMEs (Pugna et al., 2016; Wood, 2001), this approach can be very helpful for their marketing planning and decision-making. This tool can be practically used by managers and marketers of tourism and hospitality companies, even though they often lack strategic and tactical managerial skills (Pletnev & Barkhatov, 2016), because the interpretation of the results is illustrative and quite easy to understand.

## VI. Conclusions

The aim of this paper was to present a method based on geomarketing information and consumer spending data sets and use it for estimating tourism and hospitality source markets and, furthermore, for better understanding the consumer behaviour within the Czech Republic during the period 2011 - 2016. The results show the trends in the expenditure of Czech residents for the tourism and hospitality services as well as the purchasing power of the regions and districts within the Czech Republic. The time series can be used also for the prediction of the future growth and it can identify the new potential source markets on the district and regional level, that allows more precise and efficient geographical targeting of the tourism and hospitality businesses.

These kind of information can be used for more successful management and marketing decision-making process in the tourism and hospitality industry especially for SMEs, which represents the core of tourism and hospitality businesses in the tourism market. This tool can be practically used by managers and marketers of tourism and hospitality companies to estimate efficiently their source markets and increase. Another reason, why it would be beneficial for SMEs' managers, is the simple interpretation of the results, which are illustrative and quite easy to understand thanks to GIS software. This low-cost method could partially substitute other, more expensive, methods of marketing intelligence. The results can be easily used by companies from the Czech Republic within the domestic tourism, as well as by the foreign companies, which want to attract Czech visitors.

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