ESTIMATING LOCAL CONSUMER MARKET SIZE FOR MARKETING DECISION-MAKING

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Abstract

Marketing theory provides a lot of tools and methods for planning and analysis, but their practical use typically requires data that are not easily available, especially for small and medium enterprises (SMEs) operating on smaller local markets. In this study, we present a method that allows SMEs to simply estimate the size and growth trend of a local market in the Czech Republic defined by selected municipalities. The data about total consumer spending in 2011–2016 period were drawn from publicly available sources. We have created maps using the QGIS software with estimates of total consumer spending in all municipalities of the Czech Republic in 2016, total consumer spending in specific local market in 2016 and the average annual growth rate in consumer spending in 2011–2016 as well. It may serve as a guidance for SMEs about where the biggest opportunities and threats in the market size and growth are. The same method has been applied to part of South Bohemia region as a case study whose results could be used for estimation of the same figures about consumer spending.

Keywords: SMEs, consumer spending, QIS software, geomarketing, market share, decision-making

INTRODUCTION

Small and medium-sized enterprises (SMEs) make up the vast majority of all enterprises over the Europe (Audet and St-Jean, 2007; Phuangrod *et al.*, 2017). There are 19 million small and medium-sized businesses in the region that employ more than 74 million people. Although impressive, these figures do not fully reflect the importance of small and medium-sized enterprises in the society due to many additional social and economic benefits (Wiklund and Shepherd, 2003; Avidar, 2017; Kato and Charoenrat, 2018).

But SMEs are not just small-sized corporations (Lobontiu and Lobontiu, 2014; Bridge *et al.*, 1998) as very often assumed, and thus there are many differences between the situation and behaviour of smaller and bigger businesses (Greiner, 1998; Churchill and Lewis, 1983; Guo *et al.*, 2018). These differences lead to unique challenges and it is not possible to expect that methods and approaches developed for bigger corporations could be automatically applied in the same way in SMEs.

Because of limited capital and human resources, SMEs 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 producing a product or service they understand (Pugna *et al.*, 2016). In such conditions, their main focus is on working practices, but managers often lack strategic and tactical managerial skills (Pletnev and Barkhatov, 2016).

One of the differences is also in marketing management 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 (Meulenberg and Verhees, 2004). Also, specialised tasks cannot be redistributed and delegated in a simple way (Srpová and Řehoř *et al.*, 2010). 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 addition, Marcati *et al.* (2008) suggest that marketing and other actions are in SMEs typically subjectively evaluated only by the perception of a manager.

If we summarise previous arguments, there are many limitations in marketing management implementation in SMEs that lead to significant disadvantages they face in comparison to bigger companies. According to Barnett (1988), local market share and demand forecasting won't ensure SMEs success, but without it, strategic decisions will be based on unsubstantiated and often wrong assumptions. And so, it should be beneficial to develop methods and tools specifically focused on support of more advanced marketing management decision making in SMEs.

One of the issues related specifically to SMEs is their presence on local markets only because many SMEs do not operate on the scale of a whole country. To be able to respect this locality aspect, geomarketing tools and methods combined with internet-based household sales data collection could be applied to visualise and estimate local market size (Touzani and Van Buskirk, 2016). Geomarketing is a discipline that uses geographic information in the process of planning and implementation of marketing activities (Cross *et al.*, 2015; Tynan and Drayton, 1987). It can be used in any aspect of marketing, such as price, marketing communications, or geographical targeting (Fischer and Staufer-Steinnocher, 2001). The analysis of geomarketing data uses a huge data pool, such as geographic areas, topography, and it also analyzes demographic information such as age, gender, annual income and lifestyle. This information can help users develop successful communication campaigns to reach marketing goals. One of the common activities in geomarketing is segmentation of the market (Bloom, 2005) and also localization and estimation of the commercial centers in specific areas as new business opportunities (Oppewal and Holyoake, 2004; Rabinovich *et al.*, 2008).

One of the big advantages of using geomarketing tools is that huge datasets are available (many of them free of charge) and can be pre-processed by specialists. Also, results are visually appealing and easy to obtain and understand. These both factors should help in their straightforward application in marketing decision-making in SMEs, especially when such tools are prepared in advance and shared publicly.

For the purpose of practically showing this approach, we have chosen two crucial figures useful for marketing situation analysis and calculation of local market share – an estimation of size and an estimation of growth trend of a locally defined market.

Our aim is to present here both a method and a tool that allows to calculate these figures using existing publicly available secondary data for any locally defined market in the Czech Republic.

MATERIALS AND METHODS

We have started by obtaining data about average consumer spending from the Czech Statistical Office in the period 2011 – 2016 (ČSÚ, 2017) as well as geographic data with the lowest level of official territorial division in Czech Republic from the State Administration of Land Surveying and Cadastre (ČÚZK, 2017). Because the data about average consumer spending were on the level of eight NUTS2 regions, we had to decompose them on the level of individual municipalities first. This was found to be rather problematic because no detailed enough data about relationship between municipality 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, in our case only Prague. As Prague was already a separate NUTS2 region in our dataset, it was then reasonable to use the average values of consumers for the whole NUTS2 region also on the level of individual municipalities in that given region.

Data about average consumer spending and its structure were then joined together with data about 6253 Czech individual municipalities to make an estimate about the historical local consumer spending based on the following formula:

$$CS_{M,Y} = AS_{nuts2,Y} \times I_{M,Y} \qquad (1)$$

where CS is the local consumer spending of inhabitants, M is the given municipality, y is year, AS is the average consumer spending, NUTS2 is the NUTS2 region that the municipality belongs to and I is the number of inhabitants. The local consumers spending was calculated in the same way for all the municipalities in the Czech Republic as well as for the years from 2011 to 2016.

Following that, the average annual consumer spending growth was calculated using the following formula:

$$CSG_M = \sqrt[5]{\frac{CS_{M,2016}}{CS_{M,2011}}} - 1 \qquad (2)$$

where CSG is the average annual consumer spending growth.

Data about individual categories of consumer spending were also added to the dataset in the analogous way as in the Formula 1.

The next step was then to import the dataset into the QGIS software package and to link that to the geographic data about municipalities. This allowed us to generate maps and calculate the respective figures for selected local markets.

By applying the mentioned method to the local market relevant for a given SME we can simply estimate its size and growth. When the sales data for that SME is added, it is possible to easily calculate its market share. As an example on which it is demonstrated, we have selected 61 municipalities in the České Budějovice district (South Bohemia region) using circle with approximately 12 kilometres radius from a chosen SME location (Fig. 6).

The basic results information about selected area includes number of municipalities, number of inhabitants, estimated total consumer spending and average annual growth rate of consumer spending. To get the estimated local market size on a category basis, we have chosen three categories for which the estimated consumer spending was calculated: food and non-alcoholic beverages spending; alcoholic beverages, tobacco spending and clothing and footwear spending (Tab. II).

To going deeper and show how this method can be useful for one particular SME, we have chosen bakery that is located in České Budějovice for the hypothetical case study and we calculated its local market share using the method described above.

RESULTS

The first part of this chapter deals mainly with the estimation, structure and trend of consumer spending within the Czech Republic. Especially two maps (Fig. 1 and Fig. 4) clearly illustrate consumer spending level and its average annual growth rate in all municipalities. As such, they can serve as a source for identifying of new market opportunities in the Czech Republic. The second part then demonstrates how it is possible to use these data and maps for estimating local market size for SMEs operating on a smaller scale.

The estimates of total consumer spending in individual municipalities of the Czech Republic are shown graphically in Fig. 1. The consumer spending in hundred million CZK have been divided into six intervals, each with a different shade of grey on the map, so that darker grey means higher consumption in the specific municipality. The number of municipalities that fall into each interval is also included.

Based on these data, we can say that consumer spending of approximately 93 % municipalities did not exceed the total amount of 3.78 hundred million CZK in 2016. Only about 5.4 % of the municipalities

spent between 3.79–15.34 hundred million CZK when their inhabitants purchased goods and services in 2016.

A selection of twenty municipalities, respectively towns and cities, with the highest consumer spending in 2016 are listed in Tab. I. The highest spendings have been estimated in Prague, Brno, Ostrava and Plzeň. However, there are significant differences in consumer spending between these towns. For example, residents of the Czech Republic's capital city spent four times more money for goods and services than Brno residents. Still, there are not very big differences in consumer spending among other represented towns and cities in the table – the most frequent difference between the towns at the bottom of the list is usually in hundreds of millions CZK.

Fig. 2 illustrates the structure of the Czech Republic regions and their differences according to the total consumer spending in 2016 in their municipalities. In the case of regional comparison (apart from the specific position of the Prague, where consumer spending is highly above average), the variance in structure can be seen for example in the Karlovy Vary Region and Moravian-Silesian Region. In these two regions, there are more municipalities with the total consumer spending of over 4 hundred million CZK. In 2016, the highest number of municipalities (14 %) with consumer spending in the range of 3.79–15.34 hundred million CZK belonged the Moravian-Silesian Region, while the Karlovy Vary Region had more municipalities (5 %) than any other region with the consumer spending in the range of 15.35–42.79 hundred million CZK.

The consumer spending structure for 2016 in the Czech Republic NUTS2 regions can be seen in the Fig. 3. In that year, the largest share of total consumer spending in all NUTS2 regions had categories "food and non-alcoholic beverages", "housing, water, electricity, gas, fuels", "transport", "clothing and footwear" and "recreation and culture". From the point of view of the consumer spending structure between NUTS2 regions, we can say that bigger differences are especially between categories "housing, water, electricity, gas, fuels", "transport" and "recreation and culture". For example, Prague residents have spent most money of all NUTS2 regions for "housing, water, electricity, gas, fuels" (45.4 billion CZK) and "recreation and culture" (21.8 billion CZK).

To answer the question where the overall consumer spending per municipality has significantly increased during the period 2011–2016, we calculated its average annual growth rate for those years. The results can be seen in Fig. 4. Again, we have used five intervals to show the differences between municipalities and regions throughout the country.

It is obvious from the map that two most often represented average annual growth rate intervals are 0.1–1.9 % (47 % of municipalities) and 2–4.9 % (43 % of
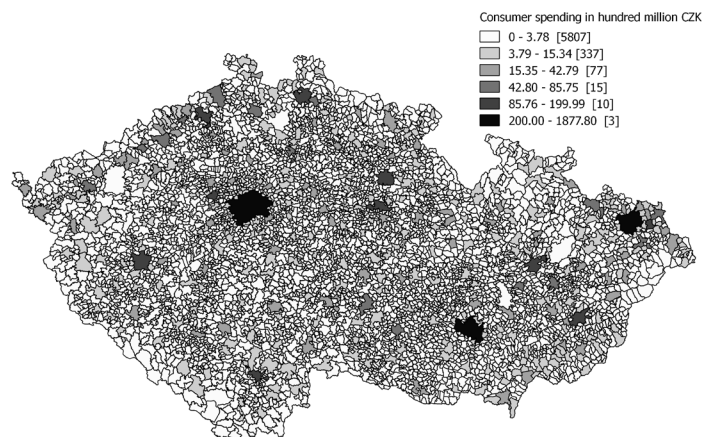
municipalities). The consumer spending trend that increased over 5 % in the analysed period, has been found only in approximately 4 % of municipalities. The areas with higher rates are represented by Liberec Region, Hradec Králové Region, Pardubice Region and Central Bohemia Region.

Region structure according to the consumer spending average annual growth rate in their municipalities is shown in Fig. 5. Significant growth in some municipalities can be explained by two main factors – increase in the spending per capita and increase in the number of inhabitants.

I: *TOP 20 Czech municipalities with the biggest consumer spending in 2016*

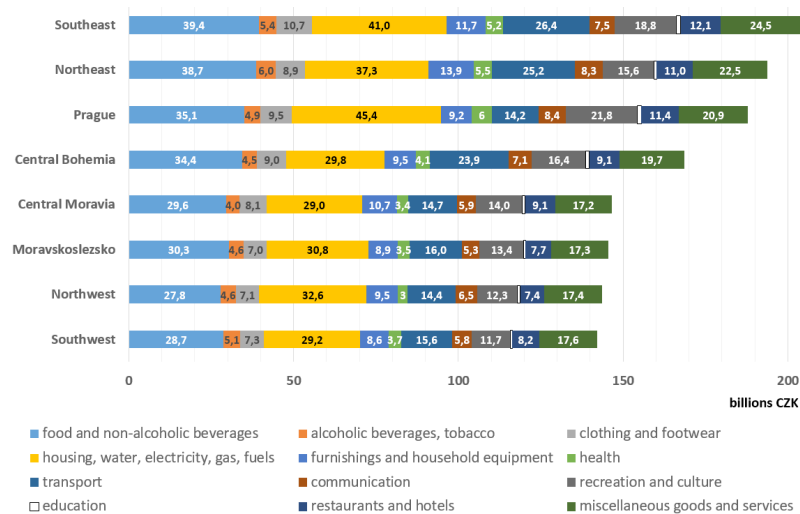| Municipality	Consumer spending in billion CZK	Municipality	Consumer spending in billion CZK
Prague	187.78	Zlín	9.05
Brno	45.69	Havířov	8.81
Ostrava	35.06	Kladno	8.64
Plzeň	19.91	Most	8.57
Liberec	13.34	Opava	6.90
Olomouc	12.09	Frýdek-Místek	6.82
Ústí nad Labem	11.94	Karviná	6.54
Hradec Králové	11.93	Teplice	6.38
Pardubice	11.56	Děčín	6.36
České Budějovice	10.91	Karlovy Vary	6.30

Source: Own elaboration based on Czech Statistical Office data (ČSÚ, 2017)

1: *Czech Republic municipalities' total consumer spending in 2016 (in hundred million CZK)*
Source: Own elaboration based on Czech Statistical Office data (ČSÚ, 2017)
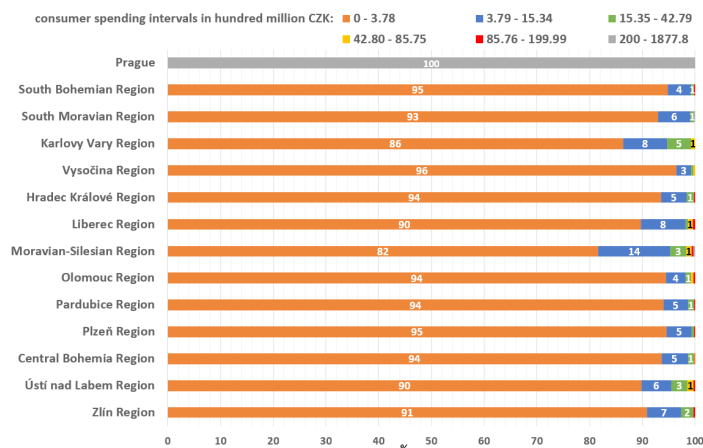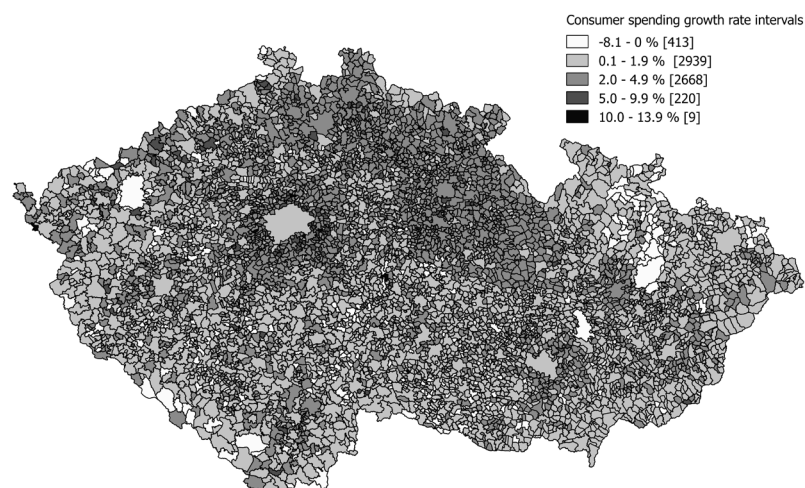

2: *Regions structure according to the total consumer spending in 2016 in their municipalities (%)*
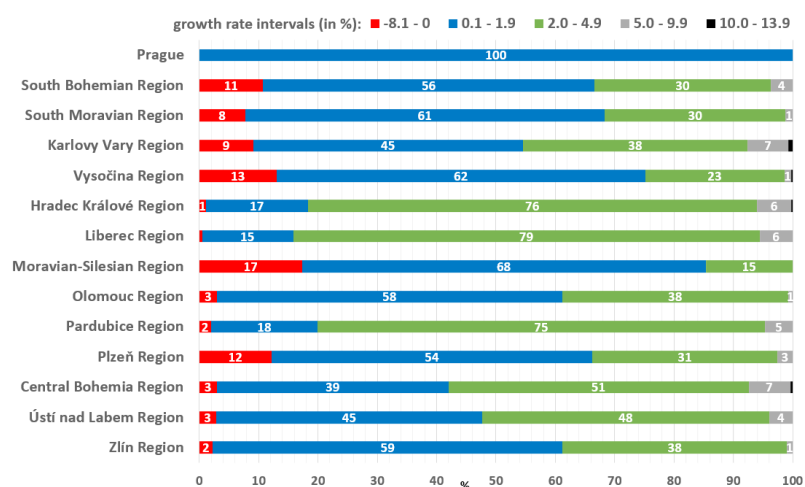Source: Own elaboration based on Czech Statistical Office data (ČSÚ, 2017)

3: *Consumer spending structure in 2016 by NUTS II*
Source: Own elaboration based on Czech Statistical Office data (ČSÚ, 2017)

4: *Czech Republic municipalities' average annual growth rate in consumer spending in 2011–2016 (%)*
Source: Own elaboration based on Czech Statistical Office data (ČSÚ, 2017)

5: *Regions structure according to the consumer spending average annual growth rate in the period 2011–2016 in their municipalities*
Source: Own elaboration based on Czech Statistical Office data (ČSÚ, 2017)

Hypothetical case study

To get the estimated local market size on a category basis in České Budějovice district, it is possible to generate estimated total consumer spending for all twelve consumption expenditure categories (Fig. 6) or just selected categories that are important for decision-making. For example we have chosen three categories that are shown in Tab. II.

To be able to calculate the local market share as proposed, the only operation that we need is to divide the estimated market size by the SME sales volume. This is possible to do also on a historical basis and we can get a time series and see the progress over time (in our case the data are available for years 2011 to 2016 and very soon also for 2017).

To show how our proposed approach could lead to useful estimates of a local market size and market share for particular SME, we have chosen a hypothetical case study: a small bakery located in České Budějovice and serving customers within 12 kilometres range. The bakery had sales of 26 milllion CZK in 2016 and 2.48 % average growth of sales in the period 2011–2016. Based on the estimated bread and cereals spending shown in Tab. II and bakery total sales, its calculated market share in selected area was 4.66 % in 2016. The bakery growth rate in 2011–2016 period was below the calculated average annual growth rate of consumer spending in that area (2.48 % vs 2.79 %

as shown in Tab. II). So, in our opinion the bakery management should find the way how to increase its growth not to face business problems in the next few years.

When we add other further publicly available data about municipalities like the age structure of inhabitants, newly built flats, residential houses and existing accommodation establishments for tourists, it is possible to extend the estimates by more detailed potential customer profiling including tourists. This method can be also further extended by regression analysis to make forecasts about the future local market development.

The secondary data used for the estimates were drawn from publicly available sources and imported into the QGIS software which is free of charge. Even when pre-processed, the costs for generating results are very low and easy to obtain, especially because the generation of reports for chosen areas could be automated. As such, this method can serve as a substitute for commercially available studies by market agencies.

DISCUSSION

Some researchers applied geomarketing methods to get information about market size and local consumer demand. They often used different theories and tools, such as combination of the historical sales data with the particular geographic and demographic information; with
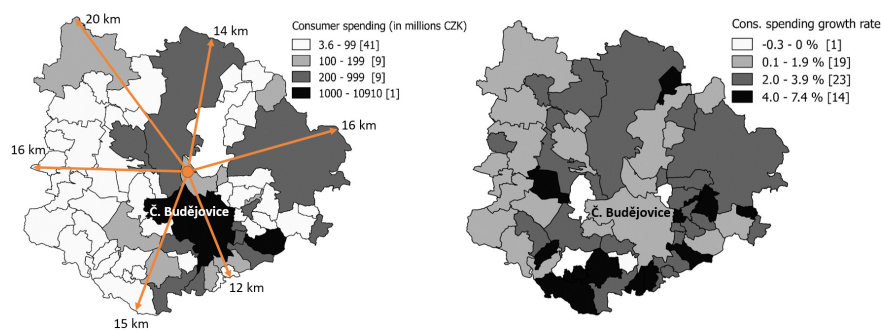
6: *Case study outputs – estimated total consumer spending and growth rate in the selected area*
Source: Own elaboration based on Czech Statistical Office data (ČSÚ, 2017)

II: *Case study outputs – selected area information and estimated consumer spending*

Selected municipalities information (2016)	
number of municipalities	61
number of inhabitants	147 845
estimated total consumer spending	17 256 000 000 CZK
average annual growth rate of consumer spending (2011–2016)	+2.79 %
Selected consumption expenditure in the area (2016)	
estimated food and non-alcoholic beverages spending	3 486 480 000 CZK
estimated alcoholic beverages, tobacco spending	615 479 000 CZK
estimated clothing and footwear spending	881 895 000 CZK
estimated bread and cereals consumption	**557 836 800 CZK**

Source: Own elaboration based on Czech Statistical Office data (ČSÚ, 2017)

the point of interest data or other external data. As opposed to our study direction, these theories were focused mainly on the localization and estimation of the commercial centers in specific area for retailers (Silverman, 1986; Oppewal and Holyoake, 2004; Rabinovich *et al.*, 2008).

A similar approach to ours in estimating consumer demand was recently published in study dealing with the Chinese FMCG market. It proposes combination of the historical sales data and geomarketing methods to estimate demand in micro-geographic scale (Wang, Fan and Gong, 2018). However, until this time we have no awareness of the similar research that would use geomarketing methods and consumer spending data to estimate local market size and its growth trend in Czech Republic.

Our proposed method allows to identify size and growth trends for selected locally defined markets in the Czech Republic. Because it is based solely on secondary data available from the Czech Statistical Office, it has several limitations. It is now possible to use it for the Czech Republic only and it is based only on categories of household consumer spending as shown in the Fig. 3. Described method of estimating do not take into consideration local specifics in consumer spending (we use NUTS2 averages per capita) and concurrently there is no direct involvement of tourism impact, data are limited on people officially living in the area only.

There are also limitations because of limited data complexity. The available data about consumer spending did not contain standard deviations, so we were unable to calculate confidence intervals and and subsequently determine statistical significance.

However, from our point of view, testing hypotheses in this kind of research does not make much sense, because the main goal is to primarily propose a practical tool that can be effectively used by SMEs. In our opinion, it is also possible to take it as contribution to general scientific knowledge. For example, in combination with complex SMEs' sales data, it should be possible to estimate the size of local markets and their dynamics with this method.

However, we assume that even with such limitations the overall precision of the estimated results should be not compromised too much, especially in areas with smaller tourist activity or with product categories that are not influenced by tourism. When more precise data would be required, also the costs would increase significantly.

For the future research, a very similar approach can be used in some other countries where comparable data are available. For these purposes, it is for instance possible to use data published by Eurostat for other EU countries. It would also be beneficial to compare these results with primary data or reports provided by market research agencies to check their accuracy and add estimates about tourism spending where meaningful.

It is also possible to create a decision support tool, e.g. a web application, that would allow to generate pre-defined reports for any given area and product category. Such a tool could serve both for SMEs as well as for education.

Although our research study points in a different direction, with our results we are also adding some more recent updates to the previous studies analysing consumer spending in the Czech Republic (Večerník, 2008; Hronová and Hindls, 2008).

CONCLUSION

In this study, we have presented a method that allows SMEs to simply estimate the size and growth trend of a local market in the Czech Republic defined by selected municipalities and product categories. Such results can be used as a basis for local market share calculation and to enrich situation or scenario analysis.

The proposed method is based on a combination of geomarketing information and total consumer spending data in 2011–2016 in Czech Republic and resulted in a estimation, structure and trends of consumer spending in all Czech municipalities. Two GIS maps were created to make the results more transparent. They clearly show number of dissimilarities in Czech household consumption in 2016 and also identify different rates of the average annual growth in consumer spending that were calculated for the period 2011–2016.

On the one hand we have practically shown figures on the level of the Czech Republic as a whole on these maps, so it may serve as a guidance for SMEs about where the biggest opportunities and threats in the market size and growth are. On the other hand, the same method has been applied to part of South Bohemia region as a case study whose results could be used for estimation of the same figures about consumer spending. Therefore SMEs can easily estimate the local market size and growth rate with the use of this method.

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