

A decision-making method based on consumer spending data

Radim Dušek^{1*}

¹Institute of Technology and Business, Faculty of Corporate Strategy, Okružní 517/10, 37001 České Budějovice, Czech Republic

Abstract. The aim of the paper is to introduce method which allows to calculate the estimation of the total consumer spending for 2019 in different regions of the Czech Republic. Presented method is based on combination of publicly available consumer spending data sets and geomarketing information. It can be applied to estimate consumer spending in total or for example only in one specific consumption expenditure group. Thus obtained findings, that can be visualized on a map with the use of GIS software, can be considered as a basis for more effective SMEs' marketing and management decision-making process concerning Czech Republic local consumer goods markets' size and characteristics as well as for forecasting future growth rate.

Keywords: decision-making method, geomarketing, consumer spending, GIS software, SMEs

1 Introduction

Household consumer spending in the Czech Republic is divided among many different businesses that include many international enterprises, but more often, small and medium sized enterprises (SMEs). These SMEs have to face many limitations and disadvantages in their decision-making process when compared to their bigger competitors.

The simple and low-cost methods based on combination of publicly available data sets and geomarketing tools can help to reduce mentioned disadvantages. They can support adequate information to manager's decision-making process concerning selected markets growth and size as well as new opportunities.

Geomarketing can extend typical marketing mix with the spatial view. It is a discipline that uses geographic data in the process of planning and implementation of marketing decisions, so when combined with consumer spending data sets, it can be used to estimate size of the selected markets [1, 2, 3, 4]. With the use of geographic information systems (GIS), which often allow using many special analysis modules, it is also possible to visualize results on a map instead of large tables, so it is easier to recognize correlations between market potential and characteristics of consumers' behaviour [5, 6, 7, 8].

* Corresponding author: dusek@mail.vstecb.cz

2 Data and methods

The aim of this paper is to introduce method which allows to calculate an estimation of the total consumer spending for 2019 in different regions of the Czech Republic. As this method is based on combination of consumer spending data sets and geomarketing information, the results will be visualized on a map with the use of GIS software. Obtained findings can be used as a basis for more effective marketing and management decision-making processes concerning Czech Republic local consumer goods markets' size and characteristics as well as for forecasting future growth rate.

The publicly available data about consumer spending (on the level of NUTS2 over the period from 2011 to 2016) [9] as well as the Czech Republic demographic and geographic information [10, 11] were used as a basis of this method. In the first step, data sets were decomposed to the level of Czech Republic districts and then the estimation of the local consumer spending in individual districts (77) from 2011 to 2016 was calculated with the following formula:

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

where: CS = local consumer spending; D = district, Y = year; AS = average consumer spending; NUTS2 = district NUTS2 region; I = inhabitants.

The average annual consumer spending growth from 2011 to 2016 in all districts was calculated with the following formula:

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

where: CSG_D = average annual consumer spending growth in specific district.

The average annual growth rate values over the period from 2011 to 2016 were used as a basis for the calculation of total consumer spending forecast for 2019. The results were visualized with geographic information system software QGIS.

3 Results

3.1 Estimated consumer spending for 2019

The first part of results chapter is devoted to the figures with estimated total consumer spending for 2019 in the individual Czech Republic districts. The structure of the total consumer spending consists of these consumption expenditure groups: food and non-alcoholic beverages; alcoholic beverages, tobacco; clothing and footwear; housing, water, electricity, gas and other fuels; furnishings, household equipment and routine household maintenance; health; transport; communication; recreation and culture; education; restaurants and hotels; miscellaneous goods and services. Presented method can be obviously used to calculate estimated consumer spending only in one or two selected consumption expenditure groups.

The highest estimated consumer spending for 2019 have been calculated in Capital city of Prague district. Brno-city district, Ostrava-city and Karviná. The results for 40 Czech

districts (out of a total of 77 districts) with the biggest estimated consumer spending (in Czech crowns – CZK) can be seen in table 1.

Table 1. Czech districts with the biggest estimated consumer spending for 2019 (in billion CZK)

District	Consumer spending estimation for 2019	District	Consumer spending estimation for 2019
Capital city of Prague	192.19	Vsetín	18.11
Brno-city	47.19	Uherské Hradiště	18.04
Ostrava-city	39.29	Děčín	17.60
Karviná	30.06	Teplice	17.44
Olomouc	29.75	Mladá Boleslav	16.89
Brno-countryside	28.10	Chomutov	16.74
Frýdek-Místek	26.39	Přerov	16.48
Praha-east	24.33	Trutnov	16.38
Zlín	24.31	Litoměřice	16.21
Liberec	24.30	Ústí nad Labem	16.12
Pardubice	23.98	Karlovy Vary	15.42
České Budějovice	23.54	Šumperk	15.26
Plzeň-city	23.17	Náchod	15.21
Hradec Králové	22.71	Most	15.17
Kladno	21.72	Příbram	15.03
Opava	21.66	Žďár nad Sázavou	14.71
Prague-west	19.72	Břeclav	14.48
Hodonín	19.19	Chrudim	14.42
Ústí nad Orlicí	19.07	Svitavy	14.39
Nový Jičín	18.61	Česká Lípa	14.28

Source: Own processing.

For better differences visualization between total consumer spending estimations for 2019 in all individual districts, the results have been divided into six intervals, each with a different shade of grey on the map (see fig. 1).

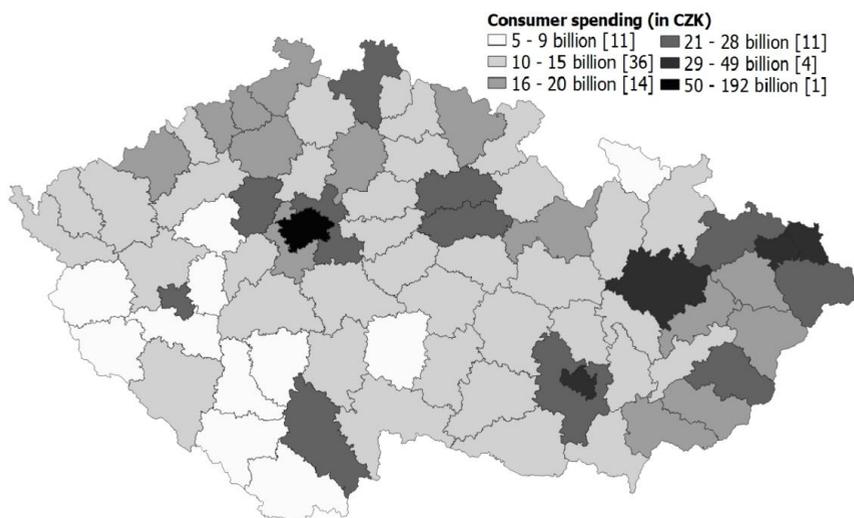


Fig. 1. Czech Republic districts' total consumer spending estimation for 2019 (in billion CZK)

Source: Own processing.

The darker shade means higher consumer spending in a specific districts. The quantity of particular districts that fall into each interval is indicated in square brackets.

The map clearly shows some interesting differences in consumer spending within the Czech Republic. Based on an estimated forecast results, it is possible to argue that residents of the northern, eastern and central districts of the Czech Republic will spend more money in 2019 on goods and services than households living in the southwest parts of the country.

3.2 Consumer spending change 2011-2019

For the effective decision-making process it is undoubtedly important to have information if the consumer spending in particular markets of interest is significantly increasing or decreasing within a certain period of time.

The answer to the question of how big are the differences in districts' estimated consumer spending when comparing years 2011 and 2019 can be seen in fig. 2. It shows percentage change in the estimated total consumer spending between 2011 and 2019 in all individual districts. From the map is evident that the biggest increase in consumer spending during the analysed period occurred especially in the west and east parts of Prague and in the northern and north-eastern districts as well.

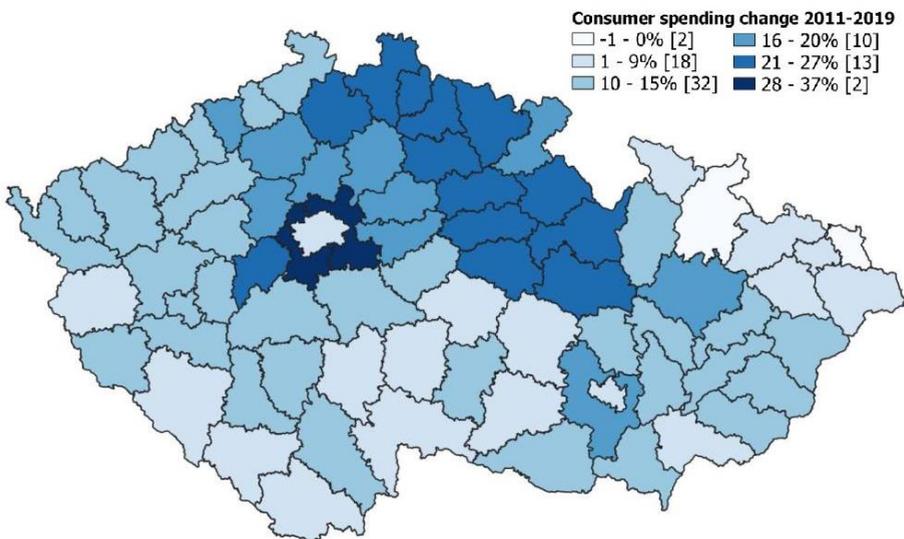


Fig. 2. Czech Republic districts' percentage change in the estimated consumer spending between years 2011 and 2019

Source: Own processing.

4 Conclusions

This study presented method which allows to forecast an estimation of the total consumer spending in individual districts of the Czech Republic. This low-cost tool enables to simply calculate estimated size and growth of a selected local market. As this method is based on combination of publicly available consumer spending datasets and geographic information system software, the total amount of money spent by Czech households could be visualized on a map at the district level.

Based on an estimated forecast results, it is possible to say that in 2019 residents of the northern, eastern and central districts of the Czech Republic will spend more money on goods and services than households living in the southwest parts of the country.

Presented method can be obviously applied to calculate estimated consumer spending only for a specific consumption expenditure group – for example food and non-alcoholic beverages. It is also possible to determine demographic profile of specific Czech district by including more detailed demographic data, for example the numbers municipalities, residents or the age structure of residents.

Thus obtained findings can be used as a basis for more effective marketing and management decision-making process concerning the Czech Republic local consumer goods and services markets' size, characteristics and growth, as well as potential opportunities or threats.

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