

Marketing Management in Retail in the Context of the Growing Trend of Electric Vehicles

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Abstract – Retail chains are the dominant player in the distribution chain, which mainly provides consumer goods to final consumers. The distribution of individual retail shops in towns and villages is related to the demography of the selected region and to the degree of urbanisation. Due to the relative saturation of the market with retail chain shops, there is a renewed need for diversification. Given a good demographic structure of the population, it is possible to diversify through new technologies, including electromobility. The aim of the article is to describe the expansion of retail chains in a selected region considering its demographics, while evaluating the potential for installation of charging stations for electric cars as an element enabling to gain and retain customers.

Keywords – retail, distribution, demography, consumers, electromobility.

1. Introduction

Retail is defined [11] as “the sum of all activities related to the direct sale of products or services to the final consumer on their personal, not business use”.

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It is the sale of goods to the final consumer in quantities that are adequate to the consumption of the individual or his family. Compared to wholesale, retail prices are higher as there is a smaller amount of goods and it is an additional part of the supply chain after the wholesale. The price increases due to various cost elements such as the cost of advertising or the costs of running the entire shopping facility. It is retail that represents the intermediary in the relationship between wholesale and a customer.

Retailers have to be set up to sell directly to consumers. This includes not only decisions about physical and digital locations, but also decisions on how to sell products and how to connect with customers. Most modern retailers usually make their strategic decisions based on [11]:

- Type of business (e.g. large national chain vs. small shops in selected cities vs. online only);
- Serviced markets (e.g. consumer of top products vs. consumer who is sensible to costs);
- Optimised range products (unless, of course, you are a major global player with extensive possibilities of sales portfolio);
- Customer service level (e.g. in-store customer relations representative vs. online support only).
- Market position (e.g. random income customers vs. specific disposable income customers).

The goal of every retailer is to create a strategy that will ensure that the customer decides to make a purchase in their premisses. According to [10], purchasing is “a function of obtaining the company’s material resources from the external environment”. An important moment in sales planning is to define the target group to which the retailer will offer its products or services. The retailer makes decisions regarding the company’s form, location selection, sales policy, or assortment program. Each of these decisions has an important impact on the company’s profitability [10].

An important strategic decision is the choice of location. Each of the retail establishments naturally goes through a strategic decision, which is the choice

of location (evaluation of customer flow, transport accessibility or proximity to a housing estate) and subsequent the evaluation of the selected location (independent or cooperative).

To evaluate a location of the retail unit, we use the following basic methods:

- Relative entropy method - focuses on measuring the distribution of the population in a given location with respect to the distribution network, coverage and spatial dispersion;
- The method of the minimum level of saturation of the location - focuses on the minimum level of equipment of the location, which affects the profitability of competitors or causes their demise at each new location [4];
- The method of territorial analysis in retail also plays an important role. It evaluates the area of interest of a retail unit, defines the purchasing potential of the location while considering the purchasing gradient. It determines the possibility of coverage of the purchasing potential of the selected location by competition. Finally, it determines the capacity of the retail unit [4].

According to [3] the concentration of business structures means the creation of effective units that can ensure the fulfilment of their technological, economic, organisational and managerial functions. The intensity of internationalisation was fully manifested in Slovak retail after 1989. This year marked the transition to a market economy. This year started the arrival of international companies onto the domestic markets of many post-communist countries. We can state that this trend continues today. The way in which internationalisation affects the Slovak retail segment can be seen in list of Top 10 companies in Slovakia, which is published on a regular basis [3].

2. Evaluation of Demographic Structure and its Trends

To examine the strategy of retail chains within the selected region, it is essential to know the demographics of the area. The first indicator is the population in the region (Table 1). We monitored this indicator through the Slovak Statistics Bureau [5].

Table 1. Development of the population of the Bratislava Region

Bratislava Region	2000	2001	2002	2003	2004	2005	2006	2007
Permanent residents 31.12.	617049	599042	599736	599787	601132	603699	606753	615050
Change n-1		0.97	1.00	1.00	1.00	1.00	1.01	1.01

Bratislava Region	2008	2009	2010	2011	2012	2013	2014	2015
Permanent residents 31.12.	616578	622706	628686	606537	612682	618380	625167	633288
Change n-1	1.01	1.01	1.01	0.96	1.01	1.01	1.01	1.01

Bratislava Region	2016	2017	2018	2019	2020
Permanent residents 31.12.	641892	650838	659598	669592	677024
Change n-1	1.01	1.01	1.01	1.02	1.01

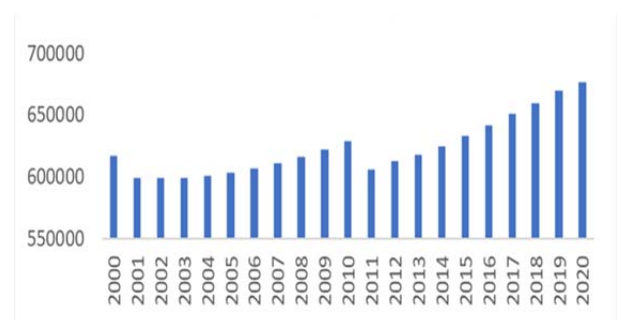


Figure 1. Development of the population of the Bratislava region

The Statistics Bureau shows the population at the middle of the year and at the end. For purposes of this analysis the situation at the end of the calendar year was considered, i.e. status of permanent population as of 31st of December. The change in the population was measured by an index where values below 1 represent a decline and values over 1 mean an increase of the population (Figure 1).

In the observed period 2000 to 2020, the smallest increases were at the level of 0.96 in 2001, 2011 meaning an actual decline in population by 4%. On the contrary, the largest increase was at the level of 1.02 in 2014. This means a 2% increase in the number of inhabitants compared to the previous year.

The graph shows the decrease in population at 10-year intervals. These are identical with the census period. As a result, the total population was adjusted to a lower level due to the results of national census. This means that the continuous adjustment of the population creates a statistical error of about 4% in a period of 10 calendar years.

The average growth rate of the population is at the level of 1% per year. However, this figure includes the above-mentioned error. After removing the error, the average growth rate of the selected period is at the level of 0.63%.

According to this indicator, the total population increased by approximately 60,000 in the reviewed period. This corresponds to an increase of almost 10% between 2000 and 2020.

The monitored region shows an increase in population, i.e., there is an increase in the number of consumers for retail chains in the long run.

Statistics provide the following data for better understanding of the internal structure of a population change (Table 2):

- Emigration from permanent residence;
- Immigration to permanent residence;
- Deaths;
- Births.

Table 2. Development of population change in the Bratislava region

Indicator	Average (persons)
Eviction from permanent residence	3698
Immigration to permanent residence	7782
Migration balance	4085
Deaths	5872
Births	6902
Deaths vs Births	1031
Total variation of population	5115

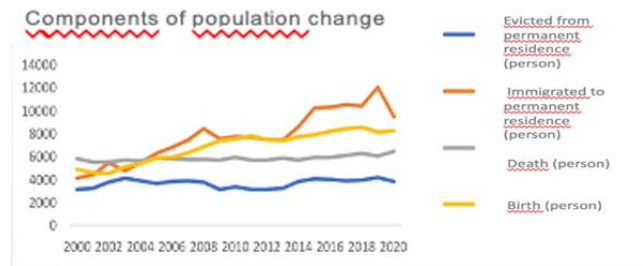


Figure 2. Graph of Development of factors changing the population of the Bratislava Region

The impact of migration on the region’s population can be deduced from the first two mentioned numbers (Figure 2). Another indicator is the difference between natality and mortality of the region. The summary of changes in these indicators speaks of an overall change in population.

- Emigration from permanent residence had the smallest increase of 3143 in 2009. On the contrary the largest increase by 4193 in 2019.
- Immigration to permanent residence had smallest increase 4180 in 2000. On the other hand, the largest increase was by 12079 in 2019.
- Number of persons diseased had the smallest increase 5524 in 2002. On the contrary, the largest increase by 6507 was in 2020.
- Births had the smallest increase of 4575 in 2002. On the contrary, the largest increase of 8589 was in 2018.
- Migration had the smallest increase 650 in 2003 and the largest increase 7886 in 2019. Natality vs. mortality smallest increase -949 in 2002 and, on the other hand the largest increase 2316 in 2016.
- The total population change was the smallest by 71 in 2003. On the other hand, the largest increase by 10019 was in 2019 [1].

The population of an entire region can be statistically followed in smaller partial districts as well.

Table 3. Development of the change in the population of the Bratislava Region by region

Population 31.12.	2000	2020	Index	Evaluation
Bratislava region	617049	677024	109.72	Average increase for the whole region
District Bratislava I	45687	42546	93.12	Decrease in number
District Bratislava II	116669	111599	104.54	Average growth
District Bratislava III	63400	70641	111,42	Above-average growth
District Bratislava IV	98303	98404	100.10	Stagnation
District Bratislava V	128356	112688	87.79	Decrease in number
District Malacky	64202	75325	117.33	Average growth
District Pezinok	54282	66174	121.91	Average growth
District Senec	51220	94577	184.65	Average growth

This breakdown by districts (Table 3) shows that the overall growth is not equally spread across the whole region. Some regions decline in population numbers, other stagnates while some grow. This district shows and exceptional growth.

The number of inhabitants of a region is not the sole indicator for retail chain development. The age structure of that population needs to be evaluated as well (Table 4). Different age groups will have different demands on their retail shops in terms of their needs for products and for added services.

Table 4. Development of the age structure of the inhabitants of the Bratislava Region

Year	to 19	20 to 69	70 and more
2000	24%	68%	8%
2020	21%	68%	11%

Table 5. Development of unemployment in the Bratislava region

Year	Unemployed	rating
2002	17.45%	growth of economy and employment
2003	15.56%	growth of economy and employment
2004	13.07%	growth of economy and employment
2005	11.36%	growth of economy and employment
2006	9.40%	growth of economy and employment
2007	7.99%	growth of economy and employment
2008	8.39%	crisis and drop of employment
2009	12.66%	crisis and drop of employment
2010	12.46%	crisis and drop of employment
2011	13.59%	crisis and drop of employment
2012	14.44%	growth of economy and employment
2013	13.5%	growth of economy and employment
2014	12.29%	growth of economy and employment
2015	10.63%	growth of economy and employment
2016	8.76%	growth of economy and employment
2017	5.94%	growth of economy and employment
2018	5.04%	growth of economy and employment
2019	4.92%	growth of economy and employment
2020	7.00%	covid effect

The region shows signs of aging (Table 5). This is not visible in the group 20–69-year-olds; however, there is a visible drop of young people while the older group begins to be stronger in terms of the share in the entire population.

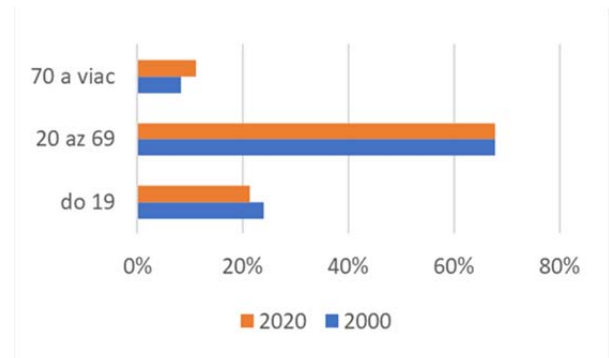


Figure 3. Development of the age structure of the inhabitants of the Bratislava region

Aging of the population as a whole is a subject that needs to be taken into account by the retail chains (Figure 3). It is not only the retailers who need to consider this fact. The social system will be influenced as well. The structure of population described above shows currently a good potential for retailers who should pick electromobility and charging stations as a potential for differentiation. A strong population in the middle of their lives will most likely have enough capital to go ahead with electromobility.

On the other hand, if the structure does not improve there is a chance for population decline over time. This would pose a risk on the overall sales potential and also a potential thread for the development of value added services. Another aspect influencing the services required by a population is the unemployment rate. This has an impact on the disposable income.

Unemployment as an indicator hence shows also the attractiveness of the region for retail chains. We have presented here the unemployment indicator for the Bratislava Region showing the registered unemployment rate 2000-2020 (Figure 4).

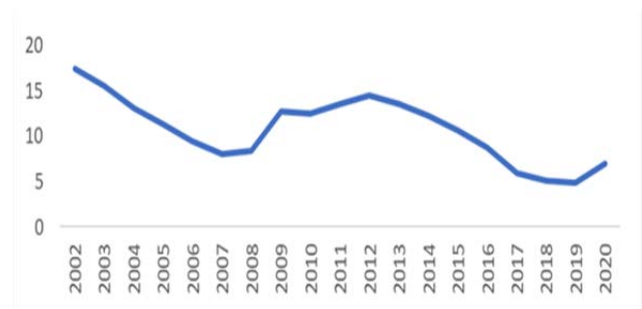


Figure 4. Development of the percentage of unemployed inhabitants of the Bratislava region

Data show economic weakening during the economic crisis after 2008 and economically challenging period until 2012. Subsequently, economic growth and a decline in the registered unemployment rate until 2019 is also shown. The year 2020 shows an impact of the COVID-19 pandemics. Unemployment rises, but it is still lower than during the economic crisis. In general, this is positive for the retail chains. There was no significant shortfall in household incomes.

3. Retail Stores in the Bratislava Region

There are several retail chains in the Bratislava region. The most well-known chains include Billa, Lidl, Tesco, Coop Jednota, Kaufland, Můj obchod, Kraj, Terno and CBA. The chain with the highest incidence of shopping facilities is Terno and, conversely, the least common chain is Kaufland. As far as Slovak retail chains are concerned, Kraj and Terno have the highest presence. Coop Jednota has the lowest percentage in Bratislava region even though they have the highest number of stores in Slovakia (Figure 5).

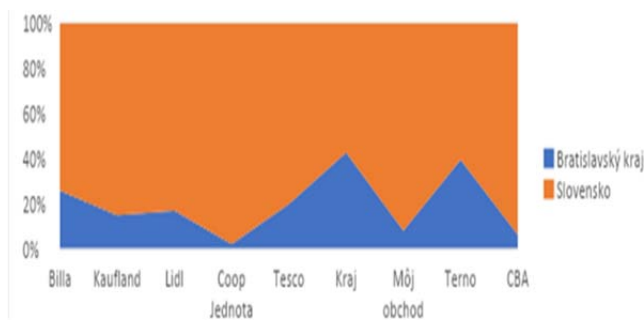


Figure 5. Retail chains in Slovakia

Table 6. Impact of retail chain location on population

	Coef.	Std. Error	t-ratio	p-value
Const	945,076	504,425	1,874	0,0654
Coop Jednota	-597,087	621,615	-0,9605	0,3403
Billa	4197,58	381,717	11,00	<0,0001
Kaufland	16169,6	2391,62	6,761	<0,0001
Lidl	-2835,99	1582,67	-1,792	0,0777
Tesco	3815,49	657,265	5,805	<0,0001
Moj obchod	2872,74	420,961	6,824	<0,0001
Region	780,970	1225,98	0,6370	0,5263
Terno	614,143	604,807	1,015	0,3136
CBA	-863,075	769,634	-1,121	0,2662

Mean dependent var: 9477.079
 Sum squared resid: 5.93e + 08
 R-squared: 0.986871
 F (9, 66): 551.2212
 t (66, 0.025): 1.997
 SD dependent var: 24538.36
 SE of regression: 2997.244
 Adjusted R-squared: 0.985081
 P-value (F): 1.70e-58

The presence of individual retail chains varies between the different districts of the Bratislava Region (Table 6). Terno has the largest representation in the district of Bratislava (Figure 6). Coop Jednota has the largest representation in Malacky (Figure 7). In Pezinok, the CBA store is the most represented, in Senec it is Coop Jednota and Terno together with Moj obchod (Figure 8). Their main location type is in small villages.

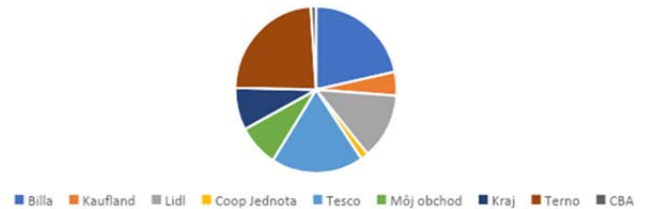


Figure 6. Retail operations in the Bratislava district

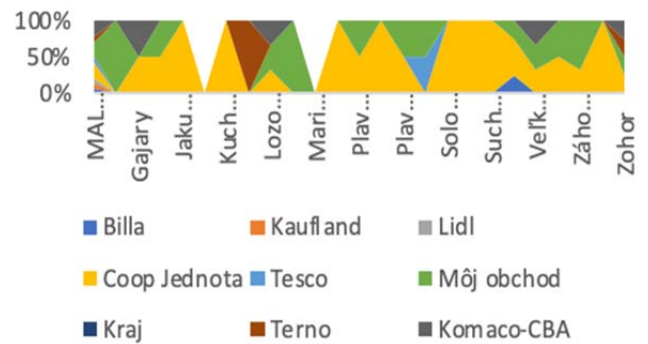


Figure 7. Retail operations in the Malacky district

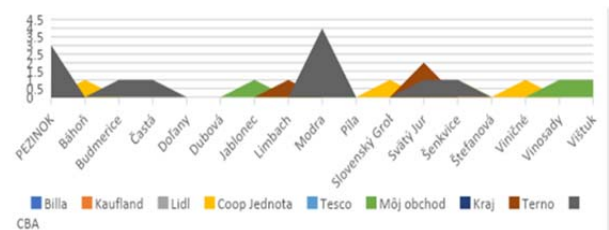


Figure 8. Retail operations in the Pezinok district

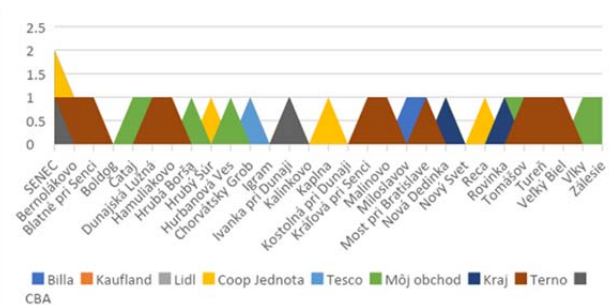


Figure 9. Retail operations in the Senec district

The major retail chains have no representation in two cities/villages in the Malacky district. The same applies for four villages of the Pezinok district and it also applies to five villages of the Senec district (Figure 9). Nevertheless, even in these eleven villages, there are other small local retail shops that

do not belong to any retail chain. The total population of the Bratislava Region is 720,258. Only 10,696 inhabitants do not have access to a representation of retail chains directly in their city/village.

$$\hat{y}_i = 945,076 - 597,087x_i + 4197,58r_1 + 16169,6\beta_1 - 2835,99\delta_1 + 3815,49\varepsilon_1 + 2872,74\vartheta_1 + 780,970\mu_1 + 614,143\tau_1 - 863,075\tau_1$$

Our analysis shows that for a retail chain to be present in a village, it has to have a population of at least 945 inhabitants. To have at least one facility of each of the retail chains analysed in the present paper at least 25097 inhabitants are needed (Bratislava IV District).

Available data on retail chains was analysed statistically.

H₀: The model is not statistically significant

H₁: The model is statistically significant

Verification of the statistical significance of the model in which the p-value is less than 0.05, i.e., the regression model is statistically significant. Using a regression model with independent variables of retail chains, we can explain 98.69% variability to the number of inhabitants of municipalities. The remaining 1.31 variability is affected by municipalities that do not have retail chains. Almost all inhabitants of the Bratislava Region have at least one establishment from retail chains at their place of residence [14].

Only less than 1.5% of the region’s population has only local food or mixed goods operations at their disposal. We see the most significant regression coefficient in the chains Billa, Kaufland, Tesco and Mój obchod. The decision of these chains and the location of individual facilities are greatly affected by the population.

Table 7. Confidence interval as retail operations increase

Variable	Coef.	95% confidence interval
Const.	945,076	(-62,0400, 1952,19)
Coop Jednota	-597,087	(-1838,18, 644,008)
Bill	4197,58	(3435,46, 4959,71)
Kaufland	16169 .6	(11394.6, 20944.7)
Lidl	-2835.99	(-5995.90, 323.921)
Tesco	3815.49	(2503.22, 5127.76)
Moj Obchod	2872.74	(2032.27, 3713.22)
Region	780,970	(-1666,78, 3228,72)
Terno	614,143	(-593,393, 1821,68)
CBA	-863,075	(-2399,70, 673,550)

In 95% of cases to increase the number of facilities of Billa by a single unit, the population has to increase between 3435 and 4960 inhabitants. At Kaufland the population has to increase between 11395 and 20945 inhabitants for an additional facility to be created. Every single Tesco requires an increase in population between 2503 and 5128 inhabitants. For the retail chain Moj Obchod, the needs are to be increased at least 2032 to 3713 inhabitants (Table 7).

On the correlation matrix (Figure 10) we see that a larger population results in the location of the retail chains of the brands Billa, Kaufland, Lidl, Tesco, Kraj, Terno. The population does not affect Coop Jednota at all. As can also be seen from the graph, Coop Jednota focuses mainly on small cities and villages in the Malacky district. There the average population is 3136 inhabitants, which is the lowest in all monitored districts.

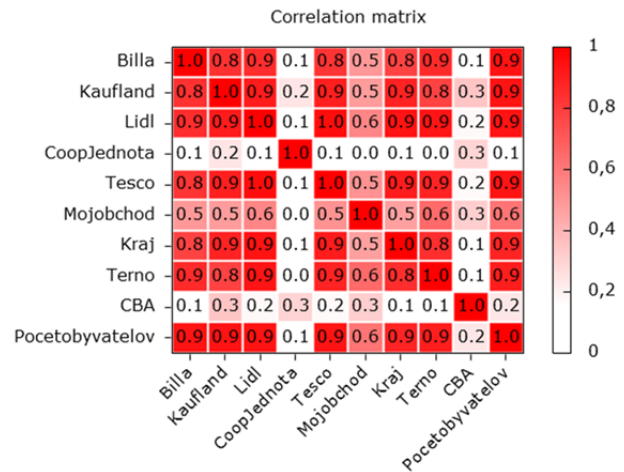


Figure 10. Correlation matrix of dependences of retail establishments on the population

For several years now, retail establishments in western Slovakia have also been involved in the electric vehicle charging industry, in different intensities, in different models and with different motivations. In general, there are the following benefits that retail owners can gain from their electric vehicle charging activities [2], [6].

The size of population that is needed for individual retail chains to open an additional facility will further impact the number of electric car chargers as each retail store has a different sensitivity and not all have the intention to use charging stations as a way to differentiate and attract consumers [15].

4. Benefits for Retail Facilities

There are several positive effects of electromobility on retail chains:

- Attracting a growing number of electric vehicle (EV) owners to their facilities/premises - to increase sales of goods.
- The segment of users of electric vehicles can be assessed in terms of revenue as higher revenue group. It means attracting a higher revenue customer segment. This can have as consequence the increase of average sales of goods per purchase.
- Providing an additional reason for existing buyers to visit. This can result in a higher frequency of purchases.
- Fulfilment of company strategies in a more sustainable business (reduction of emissions, reduction of carbon footprint).
- Creation of interesting content for marketing and PR communication.
- If projects are implemented in cooperation with professional partners doing business in the field of charging stations there are lower costs for providing added value for visitors to the facility.
- Potential additional source of income (from providing charging services, or from renting parking spaces).

The implementation of charging stations can be also a benefit for visitors that are in the same time users of electric cars [7]:

- Additional opportunity to charge the electric car. Under some circumstances this can be cost free charging.
- Use the time of purchase to charge the electric car.
- Link of loyalty benefits to the charging services.

The involvement of retail chains in providing charging services can be realised through different approaches. One of them is the construction of charging stations by the retail operation and the subsequent operations, and offer of charging services for electric vehicle users at the company's own expense. The services can be then provided free of charge or for payment [8].

Another approach is cooperation with a specialised professional company that operates the charging infrastructure for electric vehicles and ensures the offer of charging services. In this case, the retail chain can rent the relevant premises such as the space under the charging station and related parking spaces. The investment in charging stations and related operating costs, as well as charging revenues, will be borne by the specialised company/provider.

Differentiation of approaches is also in the product specialisation: it is possible to offer charging services in the "slow" charging segment, versus services in the "fast or ultra-fast" charging segment. The present paper does not focus on analysing the decision-

making process related to the selection of an optimal charging speed.

In general, the use of charging time to purchase goods at retail facility is an efficient and synergistic fulfilment of the needs that every electric car user normally needs to saturate. Simultaneous charging and shopping are a strong motivation for electric car users. Each of these activities takes a certain amount of time, so that synchronous charging and shopping ultimately saves time [9].

The above creates a unique motivation for electric car users when making their decision / choice of where to charge their electric car and do their shopping. In addition, retail chains have an additional competitive advantage over other market participants in the operation of charging stations and the offer of charging services.

The correct implementation of the benefits allows retail facilities to play a very important role on the charging services market with interesting financial benefits coming from the growing electric vehicle charging industry [16].

Link of the charging services with the energy management of the retail facility is another of the advantage or potential benefits. The competitive advantage lies in the fact that the shop (facilities) themselves represents a consumption point of electricity. With the amount of electricity consumed and its distribution over time there is a potential for creating optimal use contracted capacity provided by electric grid (such as. transformer stations) [12].

The optimal use of the installed or contracted capacity is conditioned by intelligent technical solutions that switching on or off individual appliances in the shopping centre according to predetermined criteria and priorities. A retail store can have charging stations for electric vehicles located in its parking lot. The store itself and the charging stations are powered from a single connection point (typically from a transformer station that was built during the construction of the shopping centre). In this case, in the presence of an intelligent control of individual appliances to limit power consumption in the event of high electricity consumption during sunny days, the power consumption on the charging sockets may be limited for a necessary time in order to drive the air conditioning. At the same time, reducing the power consumption on charging stations does not necessarily mean reducing the comfort of their users. If there are several sockets, the power consumption can be reduced only for some of them.

The added value comes from intelligent consumption management aimed at sharing and optimising existing capacity built for a shopping centre with the offer of charging services. It has to be taken into account that payments for available

electric capacity represent a significant component of the fixed costs of any charging station operators. The reduction of these costs can create space for offering lower prices for charging services.

Another benefit of offering charging services comes with the integration with renewable electricity sources. Rooftops of building can be used for the installation of renewable electricity sources - photovoltaic panels. They are an additional source of electricity, with renewable nature. It provides additional opportunities for the operation of charging stations and the offer of charging services. In connection with the intelligent energy management of a retail facility / shopping centre, it creates opportunities to reduce costs for overconsumption of electricity or it can increase the potential for electricity consumption including the charging of electric cars. The construction of renewable sources of electricity will reduce the potential tax burden. Carbon taxes should be introduced in the future.

Cost reduction for static transport (parking) can be another benefit for retail chains if they decide to build charging stations and offer charging services. Electric vehicle charging projects can be directly incorporated into new project. Retail chains can have, due to their negotiation position, the possibility to provide this infrastructure then smaller businesses specialised only on the charging services. When a project for electric charging is included in the project documentation from the start of the business case, the unitary price for each charging spot can be decreased compared to its creation once the facility is built.

Charging electric vehicles, however short or long (in terms of time) requires the existence of additional services, specific refreshment options, hygiene services, sheltering from bad weather and others. In most cases, commercial facilities offer these services and compared to entities that want to offer similar services in the “green field”, they have potential for significant reduction of investment costs. This is a further competitive advantage.

One of the basic prerequisites for an efficient charging service is the transport accessibility of charging stations, proximity to major transport corridors and knowledge of these locations. As these objectives are already considered in the construction of commercial retail facilities at the stage of deciding on their location, there is a rational presumption that the location of retail shops are also suitable for the location of charging stations.

Retail chains themselves are building their brand in relation to their target groups on a long-term and systematic basis. Brand awareness among the public is very strong, supported by long-term, usually very intensive marketing campaigns [13]. The experience to effectively address customers with various ways of communication (leaflets, TV, radio advertising,

online advertising, specialised applications and websites, loyalty programs and other forms of communication) creates another competitive advantage.

5. Conclusion

The analysis of demography and its evolution within the selected region provides a basis for clarifying the strategy of retail chains. The development of the population, its age structure, unemployment rate can be related to individual types and brands of retail chains. The individual chains are looking for an optimal strategy taking into account market conditions. This is related not only to the age of the population, but also to their available incomes. Each chain strives to innovate as much as possible. The goal is to gain customers' loyalty and maximize the customer life cycle. Environmental protection and the associated increase in electromobility have to be considered in the business strategy of retail chains. Customers in regions with sufficient purchasing power, especially among the economically active population, are increasingly using electric cars. Due to the evolving infrastructure, which results in its increased availability as well as the needs of charging stations for electric vehicles, there is an additional opportunity for retail outlets, which can be characterized as an additional source of income or as an additional opportunity to saturate the needs of a certain group of consumers. Charging an electric car provides time slot for purchases, and since the charging process takes several tens of minutes with available technologies, the customer can use this time to realise a purchase. The consumer who owns the electric car probably has a relatively higher disposable income at his disposal. The combination of these incentives can bring additional revenue to the retail operation and provide an opportunity for retail chains to engage in the evolving electromobility ecosystem through sustainable business in this segment.

The presented article showed the space for the development of electromobility in the studied region, considering the demographics. The presence of chains that operate electric car charging services meets the demographic and financial capabilities of the region.

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