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THE COVID-19 PANDEMIC IMPACT ON CHANGES IN RETAIL AND SERVICE SALES OVER TIME AND SPACE: A CASE STUDY OF SLOVAKIA

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The COVID-19 pandemic impact on changes in retail and service sales over time and space: A case study of Slovakia

The COVID-19 pandemic, characterized by the World Health Organization in March 2020, led to unprecedented global crises and uncertainties, impacting economies, consumer behaviour, and social activities. This study examines the pandemic's impact on sales in retail and services from January 2020 to February 2023 in Slovakia. Utilizing data from the eKasa system, which records transactions carried out at the interface of electronic cash registers in Slovakia, the study analyzes temporal and spatial patterns in sales development. Results indicate uneven distribution of the pandemic's impact across regions and differences between urban and rural areas. Despite retailers' efforts to adapt through technology and online platforms, overall sales declined, with variations observed across municipalities. The findings suggest implications for future research on consumer behaviour dynamics amidst crises.

Key words: COVID-19 pandemic, sales, retail and services, time and space, Slovakia

INTRODUCTION

The year 2020 was exceptional in particular due to the spread of the COVID-19 pandemic. The first cases of SARS-CoV-2 began to spread at the end of 2019 in China, and the number of infected people as well as deaths gradually increased. In March 2020, the World Health Organization (WHO) characterised the spread of this disease as a pandemic. Unexpected changes occurred in the economic development of various countries around the world as well as in the consumer behaviour of the people in those countries. The pandemic caused a crisis, uncertainty and often fears associated with them among the population. Information, as well as the disease itself, spread quickly in the current globalised world, and despite many, often drastic, measures that were unprecedented in modern history (e. g. nationwide lockdowns), the disease spread over the entire world. The pandemic became a crisis that transcended its status as a health crisis; its impact was far greater than merely epidemiological (Rose-Redwood et al. 2020). The COVID-19 pandemic differs from previous crises not only by its significant economic restrictions (interruption of production, disruption of supply chains, the closure of borders, etc.), but also in its effect on society and the daily activities of citizens (working from home, distance learning, closure of businesses, etc.). Various crisis situations influence the development of sales in retail and services (Anagboso and McLaren 2009), which can be geographically determined (Formánek and Sokol 2022 and Kunc and Križan 2022). Measures related to the COVID-19 pandemic have affected retailers and changed their strategies (Stanca et al. 2023). These actions created certain patterns of sales development during the COVID-19 pandemic. The first pattern of altered sales is based on the mandatory closure of brick-and-mortar stores and the transition to online sales. The shift of existing customers from stores to the internet led to increased online sales in some cases (Hwang et al. 2020). The COVID-19 pandemic accelerated the transition to online retail, but physical stores still play a significant role in retail (Gupta et al. 2023). In the case of services, there was a significant decline, especially in establishments with high levels of human contact (Fairlie and Fossen 2022).

During selected pandemic months, there was a decline in sales in both essential (e. g. groceries) and non-essential retail (e. g. footwear) with a demonstrable impact of the COVID-19 pandemic (Myran et al. 2021). More detailed research into these different patterns of sales development showed increased consumption of selected goods and thus increased sales in retail or services, especially in the initial stages of the COVID-19 pandemic. Examples include increased sales of alcohol and tobacco products (Castaldelli-Maia et al. 2021 and Lee et al. 2021). During the COVID-19 pandemic, alcohol sales in Canada had a similar seasonal pattern as before the pandemic, but the per capita value of alcohol sold during the pandemic was higher than the average value of alcohol sold in the same period in the previous three years (Myran et al. 2021). However, retail sales for alcohol in some states (Finland, Norway and Sweden) had a seasonal pattern and cannot be attributed to the impact of the pandemic (Gunnerlind et al. 2024).

Geographically conditioned research on the development of sales in retail and services during the COVID-19 pandemic can also be argued with another pattern. This is the regional (spatial) implementation and enforcement of restrictions or public health measures and the associated reactions of residents to the spread of COVID-19 (Fairlie and Fossen 2022). The impact of the COVID-19 pandemic on changes in sales in retail or services is evident in many economies. However, the magnitude of the negative economic effects of the pandemic and their sensitivity to the severity of theCOVID-19 illness can vary over time and space (Angelov and Waldenström 2023).

The COVID-19 pandemic also led to significant changes in consumer behaviour. Even though the term "lockdown" is often associated with the term pandemic, the start of the pandemic was, paradoxically, characterised by an increase in retail sales. This was an effect of panic shopping at the initial stages of the COVID-19 pandemic (Hall et al. 2020, Pantano et al. 2020, Čuláková et al. 2022 and Trembošová and Šramka 2022) or excessive consumption (Gordon-Wilson 2022 and Zuokas et al. 2022). In the end, however, the COVID-19 pandemic led to a drop in consumption due to restrictions in retail and services and the hard-to-predict development of the spreading disease. In certain segments of retail, despite the restrictions, there was an increase in consumption, or sales, an example is alcohol consumption (cf. Lee et al. 2021 and Moskatel and Slusky 2023) or pharmaceutical and drug retail (Gomes et al. 2022 and Suda et al. 2022). The COVID-19 pandemic became one of the most significant factors influencing the development of retail or services, or consumption, particularly in 2020 and 2021. As a result of the adverse pandemic situation and restrictive measures, many business subjects partially or completely limited their operations, which was expressed as a decrease in sales, or by transferring sales to another industry. Retailers faced various short-term challenges related to health, safety, supply or consumer needs (Donthu and Gustafsson

2020). The persistent restrictions and uncertainty led to a search for new ways to reach customers, often by selling through the internet (Beckers et al. 2021 and Svatosova 2022). Online shopping was already on the rise prior to the pandemic, but the pandemic multiplied it. Many consumers preferred the online method of making purchases to avoid shopping in a brick-and-mortar store with a higher probability of infection (Alaimo et al. 2020), and online shopping was often the only option for obtaining certain goods, especially when selected establishments were closed (e. g. establishments with clothing, selling toys, etc.).

The COVID-19 pandemic has created unprecedented challenges to societies worldwide, impacting various aspects of life including health, economy, and social dynamics. The spatial manifestations of the COVID-19 pandemic are clear; thus, a geographical analysis offers valuable insights into the spatial distribution and patterns of the pandemic's effects. In this study, we point out the approach of geographers to explore how scholars have contributed to understanding the geospatial dimensions of the COVID-19 pandemic. We conducted a review of journal contributions recorded in the Web of Science (WoS) database within the field of geography. Articles focusing on the COVID-19 pandemic were identified and analyzed for their geographical relevance and thematic content. The analysis included the geographical distribution of contributions, key research themes, and gaps in existing literature. Our analysis reveals a predominance of journal contributions from countries such as the USA (17.2%), the United Kingdom (12.8%), China (9,7%), Poland (5.0%), the Czechia (2.0%), and Hungary (1.4%). Despite being relatively less represented (0.6%), Slovakia has made notable contributions to understanding the pandemic’s impact, particularly through thematic studies focusing on socio-economic dynamics within the country. Slovak geographers have addressed a diverse range of topics related to the COVID-19 pandemic, including unemployment and labor market dynamics (Michálek 2021 and 2023a), energy poverty (Michálek 2023b), development of wages (Michálek 2023c), mortality rates (Michálek 2022 and Vilinová and Petrikovičová 2023), migration and spatial patterns (Petrovič et al. 2021 and Novotný et al. 2023) and others. These studies offer valuable insights into the differential impacts of the pandemic across regions, shedding light on socio-economic disparities and vulnerabilities.

Despite the wide research conducted in geography, our analysis identifies a significant research gap concerning the impact of the COVID-19 pandemic on retail and shopping behaviour (Čuláková et al. 2022). While studies in this area are limited, they are crucial for understanding the changing dynamics of consumer behaviour due to the pandemic. The aim of this study was to understand the distribution of sales in retail and services at the regional level using Slovakia as an example. The specific objective was to examine changes in sales development that occurred in the pre-pandemic, pandemic, and post-pandemic periods (January 2020 – February 2023). At the same time, we focused on the characteristics of spatial patterns in the development of sales in retail and services, with a focus on cities and various categories of rural municipalities. Our intention is to map the examined phenomenon in temporal and spatial contexts and identify trends in development at the regional level. The analysis is based on seeking answers to the following research questions:

How did the COVID-19 pandemic impact sales in retail and services across different regions of Slovakia from January 2020 to February 2023? (RQ1);

What differences exist in the impact of the COVID-19 pandemic on sales in retail and services between rural areas and cities in Slovakia? (RQ2);

How did the geographical distribution of retail and service sales change over time, particularly in response to varying levels of pandemic-related restrictions and measures? (RQ3).

METHODS AND DATA

The first group of methods used was focused on data collection. The main source of data for assessing the development of sales in retail and services came from the eKasa system as secondary data, which provides high-frequency data that is capable of indicating the dynamic situation in Slovak retail and services. The eKasa system is a system managed by the Financial Administration of Slovak Republic (FA) which records all transactions carried out at the interface of electronic cash registers in Slovakia, thus enabling the time-space development of the impact of the pandemic on retail and services to be monitored. Data were obtained based on an official request to the FA for the period January 2020 to February 2023. The data provide a realistic view of sales and offers opportunities for a deeper study of changes in consumer behaviour and their subsequent expression in retail sales. Table 1. shows a detailed description of the obtained data. Overall, 112,784 individual data were aggregated at the level of municipalities on a monthly basis. The identification of spatial units took place at the level of municipalities based on the name of the municipality. It is necessary to point to the inaccuracy of identifying the spatial attributes of the eKasa system data. In total, 2.0% of sales for the examined period could not be identified in terms of space (Tab. 1), the reason being an inaccurate name of the municipality or a duplicate name without the district or region attribute. However, in view of the nature of the data and the summary characteristics of sales, this was a minimal loss of information from the total data set.

Tab. 1. Selected characteristics of data on sales in retail and services in municipalities in Slovakia

Indicator/period	2020	2021	2022	2023*	Sum
Total sales in EUR	23,551,577,427	24,454,210,094	29,257,089,658	4,377,946,368	81,640,823,547
Sales on non-localised data in EUR	470,097,351	472,244,656	570,773,747	81,077,517	1,594,193,271
Non-localised data count	236	218	263	39	756
Non-localised spatial units	43	39	50	39	-
Localised municipalities	2 737	2 737	2 731	2 619	-
Sales for non-localised spatial units (%)	2.0	1.9	2.0	1.9	2.0
Non-localised spatial units (%)	1.6	1.4	1.8	1.5	-

Note: * data from January and February 2023.
Source: eKasa, own processing.

When evaluating the COVID-19 pandemic's impact on the development of sales in retail and sales, it was necessary to take inflation into account. Core inflation, which tracks the rise in prices after excluding the impact of changes in regulated prices (e. g. energy prices) and other administrative measures (e. g. tax adjustments, etc.), was used in the analysis (ŠÚ SR 2023). The monthly values of core inflation in Slovakia regularly published by the Statistical Office of the Slovak Republic were taken into account in the analysis. Time analysis was performed in the R Software.

From the second group of analytical methods, descriptive statistics methods were used. First, this was the quantification of the index of growth/decrease (Nemčíková et al. 2023) of sales in retail and services at the municipal level:

$$I_R = 100 * \left(\frac{T_2 - T_1}{T_1}\right),$$

where T_1 represents the value of sales in 2020 (or 2021) and T_2 represents the value of sales in 2021 (or 2022). The I_R growth index could acquire negative values if lower sales were recorded in a municipality than in the reference year, and conversely, the index acquired positive values if sales increased. Based on this indicator, "winners" and "losers" could be identified, i. e. municipalities where an increase or decrease in sales in retail and services was recorded during the COVID-19 pandemic.

For a more detailed understanding of spatial contexts, the analysed sales were relativised to the number of inhabitants in the municipality and compared with data for the whole studied territory. The output of such an approach is the classification of municipalities into two groups (Bilková and Križan 2013, Bilková et al. 2018 and Trembošová et al. 2019). The first comprises municipalities with sales above the average, given the number of inhabitants and the average in the studied area. These are so-called "surplus" municipalities in sales in retail and services. Their opposite is the municipalities included in the "deficient" group (cf. Očovský 1976). The quantification of given "surpluses" and "deficiencies" can also be done by introducing the theoretical amount of sales in retail trade and services (T_{Ti}) tied to the number of inhabitants in the municipality:

$$TTi = P_i * T,$$

where P_i is the number of inhabitants in municipality i and T is the average amount of sales in retail and services in all analysed municipalities in Slovakia. By comparing the real and theoretical value of the number of retail stores, data on the size of the "surplus", or "deficiency" of sales in retail and services in the analysed municipality can be acquired.

Another method of analysing the balance of sales of retail and services is the application of the concentration index of "surplus" sales in retail and services (I_k) based on the index of retail turnover surplus applied by Očovský (1976):

$$I_k = \frac{T_i - P_i \frac{T}{P}}{T_i * 100},$$

where T_i is the sales at location i, T is the sales in all municipalities in Slovakia, and analogously P_i is the number of inhabitants in municipality i and P is the number of inhabitants in all municipalities in Slovakia. I_k was expressed numerically for the years 2020 and 2022.

DEVELOPMENT OF SALES IN RETAIL AND SERVICES DURING THE COVID-19 PANDEMIC: A TEMPORAL ANALYSIS

We consider the beginning of the COVID-19 pandemic in Slovakia to be 6 March 2020, when the first case of COVID-19 was identified in Slovakia. To prevent the spread of this disease and the related protection of the population, drastic measures, which had no parallel in the modern history of the country, were introduced in the following days. Borders were closed, flights were cancelled, mandatory quarantine for travellers was introduced, and a state of emergency was declared in the country. The closing of schools followed and later the transition to distance learning and the closure of retail establishments (food stores, drugstores and pharmacies excepted). Wearing masks, later respirator masks, became mandatory. A state of emergency was declared in the health sector and was later extended to other facilities (e. g. social service facilities). The measures were often modified (relaxed or tightened) over the months that followed in view of the ongoing epidemiological situation in the country. A more significant relaxation of restrictions (for retail, services, etc.) due to the development of the COVID-19 disease did not come until June 2020.

After a relatively unrestricted summer (2020), a second wave of COVID-19 began in Slovakia in August (2020), which was characterised by its long duration. For the retail sector, this was a very long period of strict restrictions and store closures, which was reflected in a change in sales or by the shifting of sales between individual branches of retail trade. The second wave lasted until approximately May 2021. The retail industry was not prepared for the first wave of the pandemic and the consequences were significant, but the second wave lasted a long time and affected businesses even more significantly. Online trade showed an increase in sales, as it was often the only way for the retailer to connect with customers and vice versa, the only way customers could get desired goods; at the same time, the online environment provided a safer way to buy than in a brick-and-mortar store, where the risk of infection was higher.

The third wave (Cár 2022), commonly refered to the period after the summer 2021 until February 2022, began when the state of emergency declared several times in connection with the COVID-19 pandemic, expired. This wave, however, was not accompanied by significant nationwide restrictions in retail trade and services, which was manifested in the smaller impact on the development of sales (Fig. 1). During the pandemic, sectors related to services, such as restaurants, tourism, etc., were affected to a great extent. Retail was a significantly affected sector, as almost all retail operations (with the exception of operations satisfying the basic needs of the population and online sales) were closed to customers.

The pandemic had a different effect on the temporal development of sales in retail and sales in the case of rural municipalities and cities in Slovakia (Fig. 1). At the same time, differences can be seen in the countryside based on the size of the municipalities. The difference in time is associated with the adoption of anti-pandemic measures and the results changed the purchasing behaviour of consumers (Kita et al. 2022). These measures, as mentioned above, were not applied across the board, and their duration varied. The COVID-19 pandemic had a major impact on the development of sales in retail and services in Slovak towns and cities. The anti-pandemic measures were manifested by a significant drop in sales compared with other municipalities in Slovakia. One explanation may be the decrease in the number of potential customers in cities, especially with regard to working at home and the reduced frequency of commuting to work or school, or for shopping and services between the regions of Slovakia, specifically to the cities. Measures included curfews, a ban on movement outside one's district, the necessity of having a negative PCR test for free movement, or the right of consumers to leave their residences during the curfew only for the purpose of obtaining essential life needs at the nearest store from the place of residence and to return (e. g. buying food, drugstores, animal feed, fuel, etc.). Public health authority guidelines[1] were modified on a weekly basis, creating uncertainty for consumers as well as retailers and service operators. Towns and cities that provided services (and retail) not only for town / city residents but also for surrounding rural communities remained dependent on consumption almost exclusively by customers from within the town / city itself (cf. Lichter and Malý 2023 and Trembošová et al. 2023). What's more, it is necessary to point out the restrictions on tourism in Slovakia (Derco 2022), which caused a significant fall in the number of foreign tourists, or a preference for domestic tourism in the case of Slovak tourists. The decline in tourism during the COVID-19 pandemic relates mainly to urban destinations focused on foreign tourism (Vaishar and Šťastná 2022). In contrast, rural destinations recorded an increase in visitors and thus an increase in sales in retail and services in the Slovak countryside.

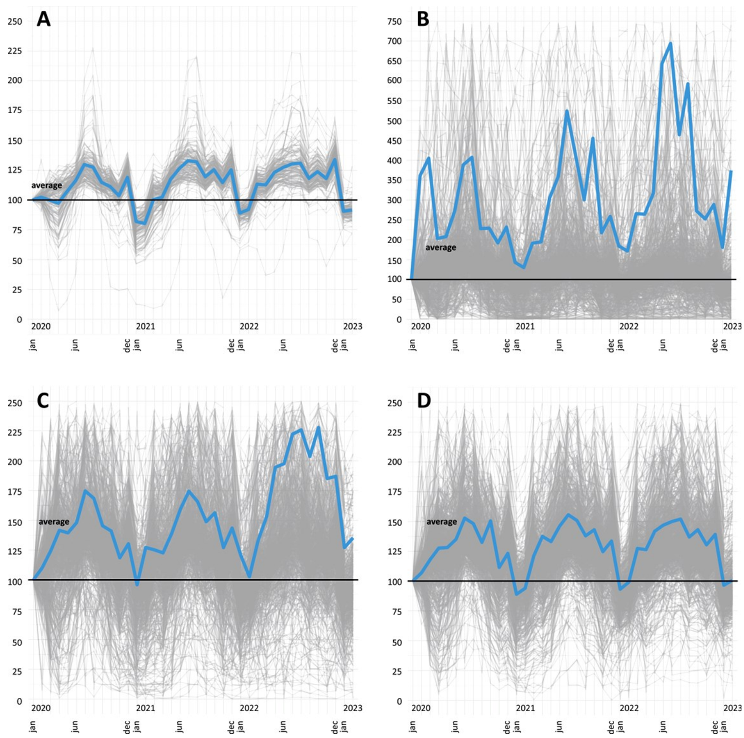

Fig. 1. Development of sales during the COVID-19 pandemic in towns and cities (A) and in rural municipalities, (B – up to 500 inhabitants, C – 501 – 1000 inhabitants, D – 1001 or more inhabitants).
Notes: the reference month is January 2020 = 100%.
Source: eKasa data (Financial Administration of Slovak Republic), own processing.

[1] https://old.uvzsr.sk/index.php?option=com_content&view=category&layout=blog&id=250&Itemid=153

The COVID-19 pandemic was manifested in different intensities and at different times in different countries, and its manifestations in Slovakia also had a regional character. Measures for preventing or slowing down the spread of the SARS-CoV-2 virus were adopted by the Slovak government at different times, depending on the ongoing epidemiological situation in the country and later in individual regions. To better understand the effect the COVID-19 pandemic had on retail and services, it is necessary to consider how the COVID-19 pandemic, or individual measures to combat it, developed in Slovakia. It is essential to note that the manifestation of the discussed limitations was not uniform in space. At the nationwide level in 2021 (compared to 2020), 44.5% of municipalities in Slovakia showed a decrease in sales in retail trade and services. The most "resilient" municipalities in terms of declining sales were identified in the Bratislava (23.6%) and Trnava (37.3%) or the Nitra regions (38.2%). In contrast, the pandemic had the greatest impact in terms of declining sales in the retail trade and services in the Žilina region, where a fall in sales was recorded in the case of more than half of the municipalities (51.8%). The Prešov and Košice regions also showed a high share of such municipalities. In 2022, a significant relaxation of anti-pandemic measures was implemented, and this is also reflected in a decrease in the share of municipalities with an overall decrease in sales in retail trade and services between 2021 and 2022. Throughout all of Slovakia, 18.7% of municipalities recorded a decrease in sales. However, this was still more than one-fifth of the municipalities in the Banská Bystrica, Prešov and Košice regions (Fig. 2).

An analysis of data for 2022 compared to 2020 provide a similar view of the impact of the COVID-19 pandemic on the development of sales in retail and services (Fig. 3). Overall, an increase in sales prevailed in municipalities in Slovakia, as year-on-year growth was recorded in the case of 76.6% of municipalities. The increased concentration of growing municipalities was characteristic of the Bratislava (86.1%) and Trnava regions (83.1%). This mainly involved an increase in sales of up to 50% compared to the previous period. Such an increase in sales was recorded in the case of 85.4% of growing municipalities. An increase in sales by more than 50% was also significant, however. The category of relative revenue growth in the range of 50.0% to 100.0% included 6.6% of the growing municipalities. An even larger (7.6%) category is represented by municipalities showing a relative increase in sales of more than 100%, and these are evenly distributed in all regions of Slovakia (Fig. 3). In exceptional cases, the relative growth of sales during the COVID-19 pandemic was even more than 1,000%. It can be assumed that this involves companies whose offer was focused specifically on the needs of consumers during the pandemic, or a narrow specialisation of products related to testing for the presence of the SARS-CoV-2 virus. However, due to the anonymisation of the data the detailed economic focus of these companies cannot be characterised in more detail (e. g. according to the SK NACE classification).

Nearly a quarter of the analysed municipalities (23.4%) saw a significant decrease in sales in retail and services between 2022 and 2020. An above-average decline in sales was identified in the municipalities of the Banská Bystrica (25.6%), Prešov (28.4%) and Košice regions (29.3%). The most pronounced relative decrease (over 50%) is seen in the Prešov and Košice regions (Fig. 3). In municipalities showing a decrease in sales, a relative decrease in sales in retail and services of more than 50% was recorded between 2022 and 2020 in 15.5% of them. These are the municipalities where the COVID-19 pandemic had the most significant impact on the decline of retail and services in terms of sales development.

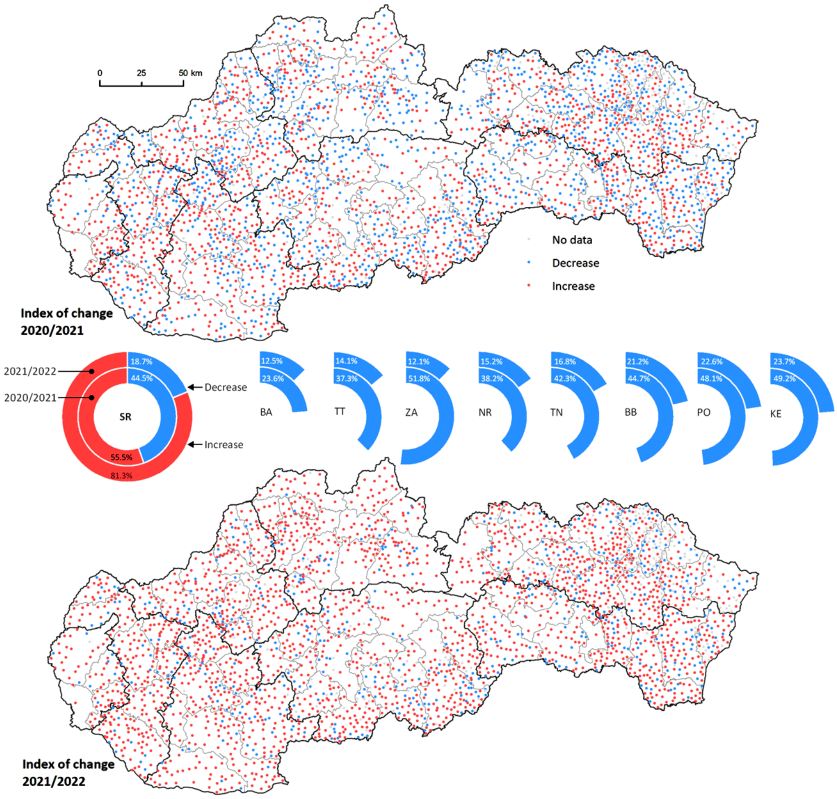

Fig. 2. Index of growth of sales in the retail trade and services between years 2020, 2021 and 2022

Notes: BA (Bratislava region), TT (Trnava region), ZA (Žilina region), NR (Nitra region), TN (Trenčín region), BB (Banská Bystrica region), PO (Prešov region), KE (Košice region).
Source: eKasa, own processing.

The COVID-19 pandemic had a different impact on the sales in retail and services in cities and rural municipalities in Slovakia (Tab. 2). The highest sales per capita values were recorded in the towns Vysoké Tatry or Námestovo. In contrast, the lowest values occurred in the towns of Modrý Kameň, Jelšava and Medzev. Of the rural municipalities, the highest revenue per inhabitant was recorded in Donovaly or Demänovská Dolina. The context can be found in the dynamic development of domestic tourism (especially in rural areas) during the COVID-19 pandemic, given the restrictions on and concerns about international tourism.

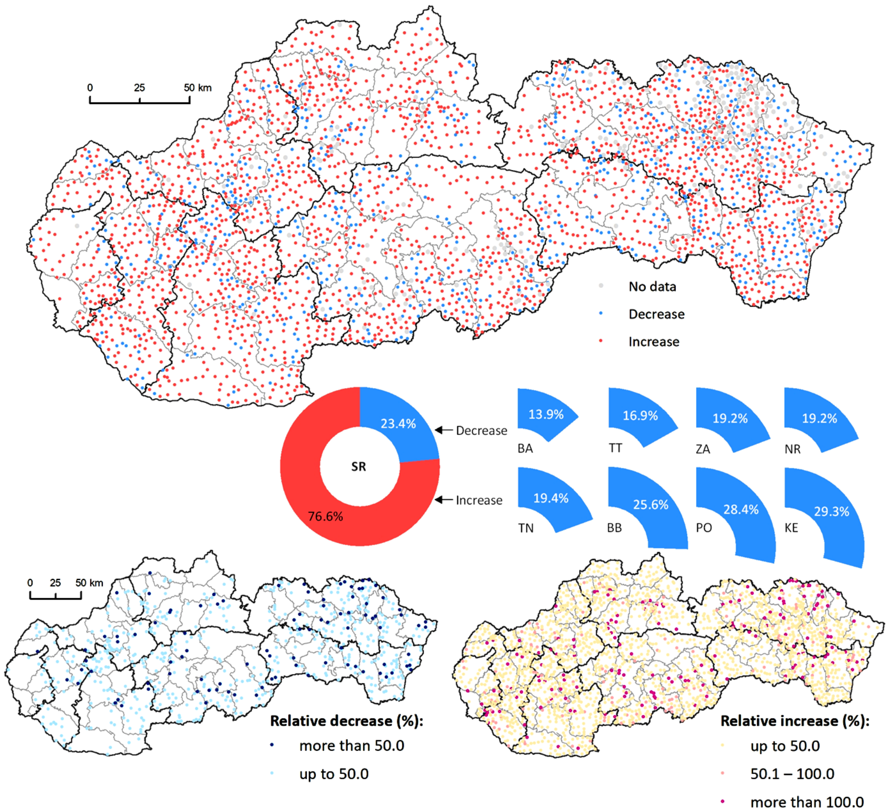

Fig. 3. Index of the growth of sales in retail trade and services between years 2020 and 2022

Notes: BA (Bratislava region), TT (Trnava region), ZA (Žilina region), NR (Nitra region), TN (Trenčín region), BB (Banská Bystrica region), PO (Prešov region), KE (Košice region).
Source: eKasa, own processing.

Tab. 2. Sales in retail and services in Slovak municipalities (EUR)

	Towns / Cities			Villages		
Year	average	min	max	average	min	max
2020	5,618	924	15,671	1,076	0	42,184
2021	5,894	1,065	17,067	1,095	0	49,198
2022	6,937	1,098	20,018	1,313	0	70,310

Note: the values are related to the number of inhabitants in the municipalities.
Source: eKasa, own processing.

Another possibility for obtaining a more realistic picture of the impact of the COVID-19 pandemic on retail and services in a spatial context is the classification of rural municipalities and towns / cities into “deficient” and “surplus” according to the balance of sales (Fig. 4). Overall, “deficient” municipalities prevail in Slovakia, and their share increased during the pandemic period. The significant regional differences, however, need to be pointed out. The largest share of "surplus" municipalities is characteristic of the larger cities. A typical example is Bratislava, which can be put into the context of suburbanisation processes, or commercial suburbanisation (Šveda and Križan 2012 and Výbošťok and Štefkovičová 2023). In contrast, an increased share of "deficient" municipalities is typical for less developed regions with a smaller number of retail business (Bilková and Križan 2013) as well as peripheral regions (Bilková et al. 2018). The highest overall concentration of "deficient" municipalities was identified in the Prešov and Košice regions, and the Banská Bystrica region also recorded an above-average share of such municipalities (compared to the Slovak average). Using this index, it is also possible to point out the increased concentration of sales in retail and services, the de facto localisation of retail and services in selected regions or municipalities. This is a trend of retail (and service) concentration related to the changed purchasing behaviour of consumers (Trembošová et al. 2022). An example is large cities, where the concentration of average sales in retail and services per inhabitant reached more than 9-times the sales recorded in Žilina or Prešov.

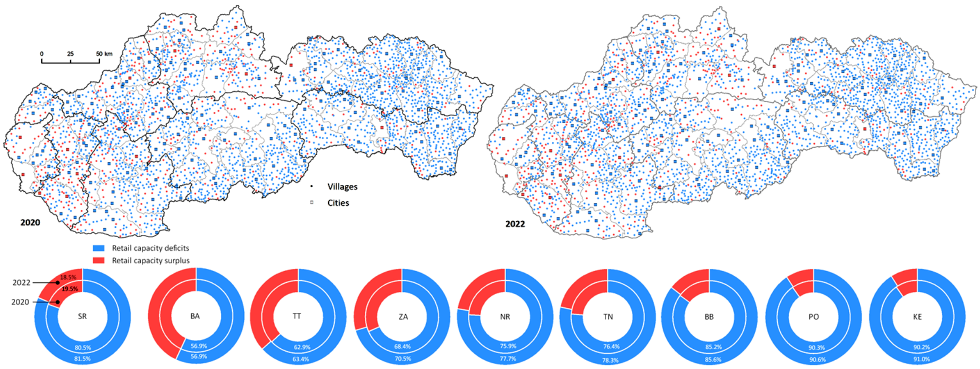

Fig. 4. Balance of sales in retail and services in years 2020 and 2022

Notes: BA (Bratislava region), TT (Trnava region), ZA (Žilina region), NR (Nitra region), TN (Trenčín region), BB (Banská Bystrica region), PO (Prešov region), KE (Košice region).
Source: eKasa, own processing.

DISCUSSION AND CONCLUSION

Given the unprecedented wave of global preventive measures, shutdowns and lockdowns forced by the COVID-19 pandemic, retail and services were among the most affected sectors of the economy. Retailers or service operators were confronted with several crisis events at the beginning of the COVID-19 pandemic. At the start of the pandemic, stores sold out of goods, especially in the area of food, drugstore and hygiene needs. Consumers began stockpiling, and this state of emergency caused a led to strong decline in brick-and-mortar sales. Both food and non-food retailers had to adapt to this new phenomenon and rely on technology and social media to motivate consumers to shop and to lure them back into their stores. Retailers developed shopping apps, opened online stores or increasingly relied on e-commerce; they also partnered with couriers and express delivery services to allow brick-and-mortar customers to purchase their goods and visit their brick-and-mortar and/or online stores. In an era of rapid development of mobile technologies, digital communication and social media, even retailers and service operators must adapt to these realities along with consumer needs and expectations, information and purchasing behaviour (Pop et al. 2023).

Despite these efforts among retailers and service providers, a decrease in sales in retail and services was identified in Slovakia during the COVID-19 pandemic. From a time point of view, the development of sales runs in parallel with the various epidemiological measures, and consumer behaviour was significantly influenced by the declarations of authorities. Initial sales growth was replaced by waves of sales declines compared to other years (RQ1). The development of sales during the pandemic showed a different phenomenon not only in time, but also in space. The analysis indicates a more significant impact of the pandemic on sales in towns and cities than in the countryside, and differences can be observed in the countryside based on the size category of municipalities. One explanation for this could be the decline in the number of potential customers in town and cities, mainly related to home working and the reduced frequency of commuting for work, school, shopping, and services between regions of Slovakia, especially to towns and cities (RQ2). The Public Health Authority's guidelines were changing on a weekly basis, which created uncertainty for both consumers and retailers and service providers alike. Towns and cities that provided services (and retail), not only for their residents but also for surrounding rural communities, remained dependent almost exclusively on consumption by city customers. At the same time, during the COVID-19 pandemic, there was a decline in tourism, which was particularly evident in urban destinations focused on foreign tourism. On the contrary, rural destinations experienced increased visitation, which led to an increase in retail and service sales in the Slovak countryside (RQ3).

It needs to be noted that the spatial distribution of retail and services in Slovakia is significantly uneven (cf. Bilková and Križan 2013), which also results in an uneven distribution of sales in these sectors of the economy. This fact was confirmed by the analysis of the balance of sales in retail and services, with a significant concentration of sales in selected regions (municipalities) even when considering the population of these regions (municipalities). However, the results indicate that the COVID-19 pandemic accentuated the mentioned concentration even more, and the number of "deficient" municipalities in Slovakia increased. This phenomenon can be considered a negative impact of the COVID-19 pandemic on retail and services in Slovakia. A time analysis of the impact of the COVID-19 pandemic on sales in retail shows a certain stabilisation in the most recent period, and the time pattern of the development of sales in retail and services repeats rhythmically.

By analysing the impact of the COVID-19 pandemic on the development of sales in retail and services, we identified a decrease in sales in retail and services in the case of 44.5% of municipalities in Slovakia (year 2021). The most "resilient" municipalities in terms of sales decline were identified in the Bratislava and Trnava regions. In 2022, a significant relaxation of measures occurred, and this is also reflected in the reduction of the share of municipalities showing an overall decrease in sales between 2021 and 2022 (18.7% of municipalities). Based on the balance of sales, "deficient" municipalities prevail in Slovakia, and their share increased during the pandemic period. The increased share of "deficient" municipalities is characteristic of less developed regions as well as peripheral regions. In contrast, the largest share of "surplus" municipalities is characteristic for larger cities.

Several limiting factors must be considered when interpreting the results of this research. The first is the nature of the data used. Sales data need to be understood in a broader economic context, as it is not an indicator of profit. A more detailed analysis at the level of operations is not possible due to the protection of personal data and the related anonymisation of data. A regional perspective must be taken into account when interpreting the impact of the COVID-19 pandemic on sales. It is necessary to interpret the results from Slovakia as a case study. Nevertheless, these data provide unique information about the purchasing behaviour of consumers in time-space contexts, and we consider them a suitable source for geographic research as well.

The methods and data used offer a wide range of use in planning practice. Knowledge of sales in retail and services at the regional to local level provides a detailed overview for marketing decision-making regarding the competitive environment and business development opportunities, and for local authorities it is about adopting effective planning strategies for current economic activity. The data can also be interpreted with regard to time (even at the level of days or hours), which creates conditions for the future direction of research into consumption rhythms.

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DOSAH PANDÉMIE COVID-19 NA ZMENY V TRŽBÁCH MALOOBCHODU A SLUŽBÁCH V ČASE A PRIESTORE: PRÍPADOVÁ ŠTÚDIA SLOVENSKA

Obmedzenia spôsobené pandémiou COVID-19 ovplyvnili nielen sociálne, ale aj ekonomické aktivity obyvateľov, vrátane ich nakupovania a využívania rôznych služieb. Išlo o zatváranie prevádzok alebo zmeny otváracích hodín, prípadne obmedzenia týkajúce sa počtu nakupujúcich na predajnej ploche a pod. Zámerom príspevku je časová analýza vývoja tržieb v maloobchode a službách v období január 2020 až február 2023 a analýza týchto zmien v priestore miest a vidieckych obcí na Slovensku. Vo všeobecnosti ide o zhodnotenie dosahu pandémie COVID-19 na maloobchod a služby. Primárnym zdrojom pre výskum boli dáta zo systému eKasa, ktoré spracováva Finančná správa SR.

Analyzovali sme údaje o vývoji tržieb v maloobchode a službách na úrovni obcí. Časovou analýzou sme pristúpili k porovnaniu tržieb s referenčným obdobím (január 2020), na základe čoho sme vyhodnotili nárast alebo pokles tržieb na úrovni obcí na Slovensku za obdobie január 2020 až február 2023. Pri priestorovej analýze sme využili niekoľko ukazovateľov. Prvým bol index zmeny, na základe ktorého sme hodnotili zmeny priemerných ročných tržieb v maloobchode a službách medzi rokmi 2021 a 2020, resp. 2022 a 2020. Ako druhý ukazovateľ sme charakterizovali index koncentrácie tržieb v maloobchode a službách a zároveň sme kvantifikovali bilanciu tržieb na úrovni obcí za roky 2020 a 2022.

Výskum naznačuje, že dosah pandémie COVID-19 sa v čase a priestore menil. Výkyvy tržieb v maloobchode a službách nie sú v čase konštantné; rozdiely možno pozorovať medzi jednotlivými mesiacmi v roku a roky 2020 a 2021 boli v porovnaní s referenčným obdobím odlišné. Tržby v maloobchode a službách boli ovplyvnené epidemiologickými opatreniami, ktoré obmedzili spotrebiteľské správanie a využívanie rôznych služieb. V počiatočných fázach pandémie COVID-19 bol zaznamenaný nárast tržieb v maloobchode a službách, ktorý spájame s panickým nákupom a nákupom do zásoby. Dôvodom bola neistota spotrebiteľov v predikcii vývoja budúcich situácií. Následný dosah pandémie COVID-19 na tržby v maloobchode a službách sa prejavil ich poklesom. Z analýzy vyplýva, že najväčší pokles tržieb v maloobchode a službách bol charakteristický pre mestá. Naopak, najmenej intenzívny dosah pandémie COVID-19 na tržby v maloobchode a službách bol zaznamenaný v obciach do 500 obyvateľov. Priemerné hodnoty tržieb v týchto obciach vykazovali počas pandémie len minimálne odchýlky. Podotýkame, že pandémia COVID-19 mala rôzny dosah na vývoj tržieb v maloobchode a službách v rôznych veľkostných kategóriách obcí na Slovensku.

Údaje zo systému eKasa naznačujú, že dosah pandémie COVID-19 nebol v priestore jednotný. Pokles tržieb v roku 2021 oproti roku 2020 zaznamenal maloobchod a služby v prípade 45 % samospráv. Najviac „odolné“ obce z hľadiska poklesu tržieb sme zaznamenali v Bratislavskom, Trnavskom a Nitrianskom kraji. Na druhej strane mala pandémia najväčší dosah na pokles tržieb v maloobchode a službách v Žilinskom kraji, kde bol pokles tržieb zaznamenaný vo viac ako polovici obcí. Vysoký podiel obcí s poklesom tržieb v maloobchode a službách bol príznačný aj pre Prešovský a Košický kraj. V roku 2022 došlo k výraznému uvoľneniu epidemiologických opatrení, čo sa prejavilo aj v znížení podielu obcí s celkovým poklesom tržieb v maloobchode a službách v rokoch 2021 až 2022. Takmer pätina obcí na Slovensku zaznamenala pokles tržieb, a to najmä v Banskobystrickom, Prešovskom a Košickom kraji.

Poznatky o časovo-priestorovom vývoji tržieb v maloobchode a službách na regionálnej až miestnej úrovni sú potrebné pre budúce prispôsobenie sa novým podmienkam a ľahšie zvládnutie budúcich krízových situácií, keďže otázkou nie je, či sa nová kríza prejaví, ale kedy sa objaví.

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