

**Publisher**<http://jssidoi.org/esc/home>**IMPACTS OF ECONOMIC CRISES ON E-COMMERCE IN CZECH REPUBLIC*****Kristína Korená¹, Petra Pártlová², David Vyšín³, Vít Kluger⁴, Michal Ruschak⁵**^{1,2} *Department of Tourism and Marketing, Faculty of Corporate Strategy, Institute of Technology and Business in České Budějovice, Okružní 517/10, 370 01 České Budějovice, Czech Republic*³ *Pehantia Ltd, Czech Republic*⁴ *Department of Trade and Finance, Faculty of Economics and Management, Czech University of Life Sciences Prague, Kamýčká 129, 165 00 Prague – Suchbátka, Czech Republic*⁵ *Pan-European University, College of Entrepreneurship and Law, Spálená 76/14, 110 00 Praha, Czech Republic*E-mails: ¹korena@mail.vstecb.cz; ²partlova@mail.vstecb.cz

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Abstract. E-commerce has been undergoing intensive development every year to match the development of information and communication technologies. E-commerce has a significant, yet diverse, impact on the analysis of selected e-commerce segments during the COVID-19 pandemic between 2021 and 2022. Metadata evaluated our results using the tools of Google Analytics, Google AdSense, and Supermetrics tool. The research involved structured interviews to refine and improve the results obtained. We also analysed the turnover and year-on-year changes of selected e-shops in beauty products, food, fashion accessories, and luxury goods, exploring the development trends related to the pandemic and the ongoing war conflict. A part of the solution was also the analysis of the tested segments in terms of the NUTS 3 regions and the specification of the development of the business segment under review from the perspective of the geographical regional location. The obtained data will provide experts and the business sector with information about the development of e-commerce during times of crisis. They also apply to existing and potential business entities regarding their position in an increasingly challenging market environment. The first approximation of the results will be refined and validated in further research.

Keywords: digital marketing; advertising campaign; online marketing; e-shop; small and medium enterprises; Meta marketing

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JEL Classifications: L81, M31, R32

1. Introduction

E-commerce is becoming one of Europe's most dynamically developing areas across all economic sectors and globally (Siegfried et al., 2021; Kolupaieva & Tiesheva, 2023). Various studies on this issue conclude that compared to brick-and-mortar stores, e-commerce is growing at an unprecedented rate (Liu et al., 2018), and its further growth will be at the expense of retail (Taher, 2021). E-commerce brings additional competitive advantages to SMEs, including increased business efficiency, reduction of costs, latest innovations, faster response and adaptation to changes, increased market share, etc. The advantages help SMEs to compete with large enterprises even in global markets (Hamad et al., 2018). A comparative analysis by Pacana et al. (2023) highlights the current approach of customers and SMEs from the V4 countries towards pro-environmental

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products, emphasising e-commerce's role in improving product quality and sustainability, aligning with global market demands. We can see this from the increasing volume of e-commerce transactions in individual countries or the worldwide market actively using the Internet compared to business transactions conducted offline.

Digitalisation, a key e-commerce component, is reshaping SMEs' operations and perceptions (Lewandowska et al., 2023; Civelek et al., 2023). Krajčík's investigation into the digitalisation of SMEs, particularly within the mining and iron industries, underscores the critical nature of public interventions and supports in facilitating this transition, thereby enhancing their competitive stance in the e-commerce landscape (Krajčík, 2022). This insight complements the view that e-commerce streamlines business transactions and necessitates a supportive ecosystem for SMEs to thrive. Furthermore, the role of social media in resolving financial challenges for European SMEs, especially those in the iron and mining sectors, is significant. Civelek's et al. (2022) international comparison reveals that social media usage can be a potent tool for SMEs to navigate financial obstacles, thereby contributing to their resilience and growth in the e-commerce domain. This perspective enriches understanding of e-commerce's multifaceted benefits, including market expansion and financial sustainability.

The online business environment aims to streamline business transactions in terms of their speed and accuracy (Mostafa et al., 2019). The costs reduced by e-commerce compared to retailing motivate SMEs to start a business, which is the primary reason for introducing e-commerce since its benefits do not exceed the costs of its implementation and running (Dahbi & Benmoussa, 2019; Gavurova et al. 2022a). However, SMEs are still afraid to start business in the e-commerce segment, lacking publicly available data and information. Another limitation is the budgetary constraints and the uncertainty concerning the expected return on investment (Gavurova et al. 2022b).

Many studies point to the importance of e-commerce and its positive impacts on the outcomes of companies or countries. The authors perceive e-commerce from three major perspectives (Jameel et al., 2018; Tran et al., 2021; Androniceanu & Georgescu, 2023) analyse e-commerce using internet applications, such as e-mail, websites, and intranet (Drew, 2003) Other authors study e-commerce from the perspective of business activities, i.e., the interaction of customers and suppliers, or B2C (Skare et al., 2023a; Daniel & Wilson, 2002; Stefko et al., 2022). From the third perspective, e-commerce combines Internet applications and business activities (Skare et al., 2023b; Kendall et al., 2001). E-commerce has advantages and potential benefits in related investments, such as the opportunity to attract new customers even in global markets (Tolstoy et al., 2001; Olah et al., 2021), the increased success rate of implemented business plans (Andonov et al., 2001), or gaining competitive advantage compared to ordinary retail (Xuhua et al., 2019), etc. The transition from traditional shopping to shopping in the online environment is a challenge for many companies (Costa & Castro, 2021). One of the optimal solutions for the business sector is the applicability of information technologies, i.e., the introduction of e-commerce with various technological modifications (Skare et al., 2024; Malitska & Melnyk, 2018; Jagoda et al., 2023; Kiba-Janiak et al., 2022). The main benefits of using e-commerce include its practical implementation, time flexibility, and low operating and management costs (Ghonyan, 2020).

The COVID-19 pandemic and other economic crises have affected global e-commerce in many ways. E-commerce is one of the rapidly growing segments, and in many cases, it helped or even replaced brick-and-mortar stores and helped the economy to survive. Customers had to adhere to strict pandemic measures, avoiding brick-and-mortar stores and crowded places; therefore, they preferred online shopping for food, clothes, household accessories, and other consumer goods. The average values of online orders increased by 10-20% in 2020 (Belair-Gagnon & Holton, 2018). Online shopping has been gaining popularity, witnessing the increasing number of e-shops in the Czech Republic, where total e-shops grew by 8% (46,000) in 2020 (International Trade Administration, 2021). Companies have gradually built a relationship with the online environment and realised the necessity of digitisation in various forms according to their needs, thus gaining a lot of experience in this area. The change forced by the pandemic has had a positive impact on the economy of the country as well as the whole society in many ways. The main positive effect was the development or increase in computer literacy, even among the older generation. The data from 2020 confirm a general satisfaction with supplying necessities and essential assortments. European e-commerce grew by more than EUR 633 billion compared to 2021, reaching EUR 718 billion, indicating a 13% increase (Lone & Weltevreden, 2022). The year-on-year turnover

of Czech e-commerce increased to CZK 223 billion, showing a 14% increase. The Czech Republic is one of the European leaders in the e-commerce segment and has the most e-shops per inhabitant. E-shops grew by 3%, reaching 50,985 e-shops in the Czech market. However, the summer months will slow the year-on-year increase down to see the e-commerce turnover soar again in Christmas (Heureka.group, 2021; Heureka.group, 2022)

2. Research objective and methodology

To the issue discussed and the set goal of the solution, we collected primary data using the Google Analytics data collection method in the years 2021 and 2022, from January to June. The collected data allows real-time web traffic tracking in several formats compared to companies engaged in web analytics. Google Analytics, in particular, is one of the most commonly used tools, with approximately 28.1 million websites currently using the service. Google Analytics is linked to Google AdSense and allows for evaluating and measuring statistical data on how marketing, content, and products engage users. Their strengths complement each other and provide a complete picture of audience behaviour, including interests, preferences, and the time spent online. They can adjust when necessary and effectively modify ads in real-time, e.g., based on performance data, to increase traffic (Belair-Gagnon et al., 2019).

Our study involves four randomly selected Czech e-shops from different industries in the first two quarters of 2021 and 2022. Based on data analysis using Google Analytics, we weighed the sensitive data of the e-shops and preserved the companies' anonymity. The first selected e-shop is a Czech company focused on manufacturing and selling cosmetic products. The second e-shop is a Czech family-owned company producing unique food products, mainly for the children's segment. The following selected e-shop offers quality headwear and other fashion accessories. The last selected e-shop specialises in quality and original jewellery.

Table 1. Sales of selected e-shops in Q1 and Q2 / 2021 and 2022 in CZK.

E-shop	Year	January	February	March	April	May	June
1	2021	5 549 941	5 405 668	6 855 472	4 584 720	6 110 980	3 916 790
	2022	5 473 792	2 659 944	4 771 307	3 921 077	3 679 390	3 695 186
2	2021	2 015 408	1 492 736	2 501 648	1 126 396	1 859 244	1 955 125
	2022	1 544 468	680 367	983 898	1 475 888	2 160 431	3 951 858
3	2021	898 878	686 817	686 817	570 813	595 172	666 302
	2022	716 178	557 951	433 776	468 153	538 940	590 061
4	2021	2 151 040	2 119 729	2 015 849	2 115 185	1 903 302	1 352 837
	2022	1 820 818	1 181 891	1 496 414	1 422 055	1 154 697	1 071 699

Source: Authors

The data from Google Analytics, see Table 1, was further exported to Google Sheets using the Supermetrics tool. It is an automated tool to crawl sites and gather information. This tool is very useful in setting up metrics according to downloaded data. Linking the Supermetrics tool to Google Data Studio generates live reports and enables dashboards to track the progress of social campaigns as they are published (McDonald, 2020). Monthly marketing costs and sales are evaluated in Excel spreadsheet files to calculate an inverted cost-to-sales ratio, called PNO or ROAS (return on ad spend). The analytics also allow for comparing last year's sales with this year's sales, i.e., the year-on-year change. You can also track the daily trend of costs, sales, PNO or CPA (cost per acquisition).

The Google Analytics tool allows a visual comparison of the outputs from the analysis performed and the identification of their trends over the reference periods. Each report consists of dimensions (data attributes, e.g., city) and metrics (quantitative measurements) (Google Marketing Platform, 2022). The metrics allow you to compare sales over the two reporting periods and identify their trend, calculated by taking the arithmetic average of the data of the reference e-shops in the first six months of 2021 and 2022 and the consequent parallel average of all four companies being the selected representatives of each e-commerce segment.

Guided interviews with the owners of the analysed companies were used as an additional method for detailed data analysis to clarify the analysed data.

4. Results and discussion

Tables 2-5 illustrate the data exported to Google Sheets using Supermetrics to compare the trend of sales/revenues in the first six months of 2021 and 2022 and the percentage year-on-year change.

Table 2 shows the cosmetics segment, suggesting the year-on-year change for all six months, i.e. the so-called "red numbers", that is a decline. In this case, the sharpest fall was recorded in February when the e-shop sales/revenues were lower by 50.79% than the previous year. Interestingly, in this month of 2021, brick-and-mortar stores had not been closed to the extent they were closed after announcing the lockdown on 26 February 2021. However, as noted by the e-shop owners in an interview, such a significant drop in February 2022 was still attributed to the COVID situation and other economic conditions in the Czech Republic, where people were reluctant to spend money on more expensive cosmetics. Thus, the most telling months are March to May, when most stores were closed in 2021, and people were left to shop online. For this reason, e-commerce performed significantly well. In 2022, according to the analysed data, the business already showed the expected decline, see Table 2.

Table 2. E-shop 1: Manufacturing and selling cosmetic products.

E-SHOP 1					
REVENUES 2021					
January	February	March	April	May	June
5 549 941CZK	5 405 668 CZK	6 855 472 CZK	4 584 720 CZK	6 110 980 CZK	3 916 790 CZK
REVENUES 2022					
January	February	March	April	May	June
5 473 792 CZK	2 659 944 CZK	4 771 307 CZK	3 921 077 CZK	3 679 390 CZK	3 695 186 CZK
ANNUAL CHANGE					
January	February	March	April	May	June
-1.37%	-50.79%	-30.40%	-14.48%	-39.79%	-5.66%

Source: Authors

Figure 1 line chart illustrates the trend in sales/revenues, which shows a considerable growth of 2021 sales. The blue peaks are interesting as they significantly outnumbered the orange curve three times. They show the values when the e-shop gives special offers to customers, thus sharply increasing sales. However, despite this rapid growth, sales were lower than in 2021, with an average year-on-year decline.

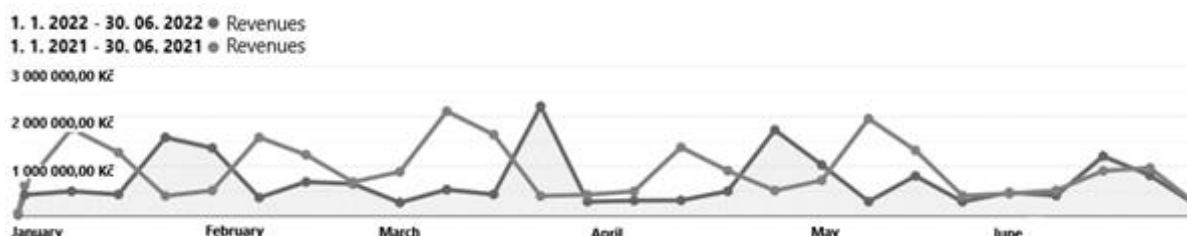


Figure 1. Sales/revenues trend: E-shop 1: Manufacturing and selling cosmetic products.

Source: Authors

The following data in Figure 1 compare the year-on-year number of transactions and sales/revenues for all the first six months of 2021 and 2022. It is also apparent from the figure that these data are partially correlated. The

approximate 5% variation is mainly due to changes in average order value, e-commerce pricing policy, product portfolio, or conversion rate.

Figure 2 presents the transactions and generated sales/revenues by gender. A year-on-year decrease in sales was identified for women, reaching an above-average 35.24% and only 1.09% for men. According to the interview with the entrepreneur, women primarily indulge in this article, so they make up the majority of sales. Unlike women (personal consumption predominates), men motivate their purchases to obtain gifts, which explains the negligible decrease compared to 2021.

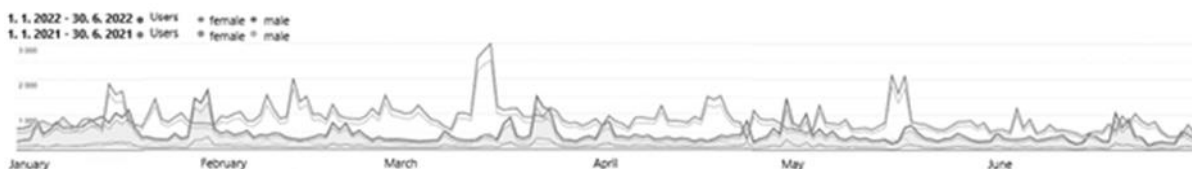


Figure 2. Sales/revenues trend by gender: E-shop 1: Manufacturing and selling cosmetic products.

Source: Authors

Figure 3 shows the year-on-year transactions and sales/revenues within NUTS-3 regions. For example, Prague, accounting for the largest share of sales, has only decreased by 15.21% year-on-year, indicating the smallest decline. The Vysočina Region saw the year-on-year trend plummet by 41.12%, implying the hugest slump. The year-on-year decrease values of the Central Bohemian Region, Moravian-Silesian Region and Zlin Region ranged from 22.85% to 28.64%. Year-on-year downturns ranging from 32.47% to 36.26% occurred in the remaining five Czech regions (South Moravian Region, South Bohemian Region, Plzen Region, Usti nad Labem Region and Olomouc Region).

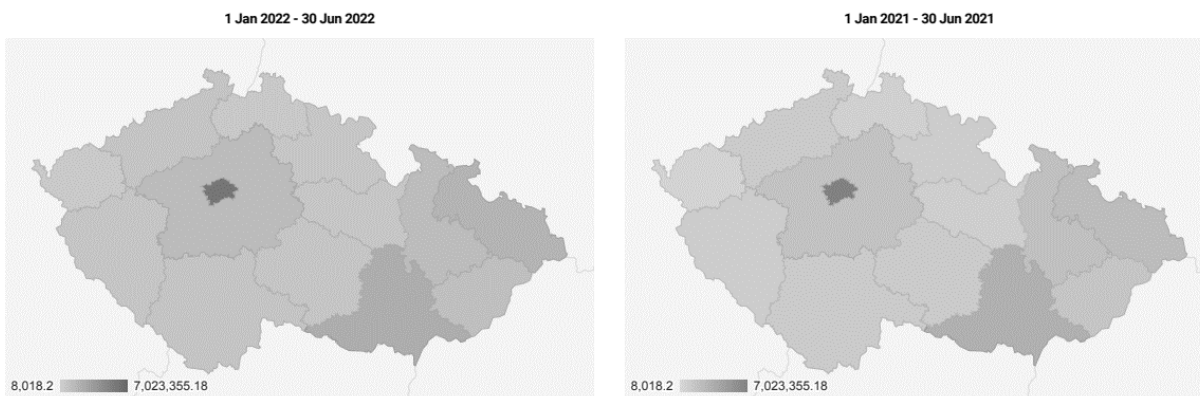


Figure 3. Map Overlay: E-shop 1: Manufacturing and selling cosmetic products.

Source: Authors

The second analysed segment is the food sector, see Table 3. The table shows the year-on-year change in the so-called "red numbers" for the first three months (January, February and March). At the beginning of January-March 2022, the company faced a problem of insufficient turnover due to the unfavourable economic conditions manifested by the reluctance to spend money as it was in the previous year. In the second half of 2022, the online business was a going concern, and its sales increased significantly, given the temporary closure of brick-and-mortar stores. The collected data and data analysis suggest that the final sales/revenue result was affected by diversification between physical stores and e-stores. The month of June shows the highest increase in sales, with the e-shop achieving 102.13% higher sales than the previous year. The company responded to the slump in Q1 2022 by profitable promotional offers and new product portfolio launches. These activities strengthened purchase motivation, among other things, by having lower prices than competitors.

Table 3. E-shop 1: Manufacturing and selling cosmetic products.

E-SHOP 2					
REVENUES 2021					
January	February	March	April	May	June
2 015 408CZK	1 492 736CZK	2 501 648CZK	1 126 396CZK	1 859 244CZK	1 955 125CZK
REVENUES 2022					
January	February	March	April	May	June
1 544 468CZK	680 367CZK	983 898CZK	1 475 888CZK	2 160 431CZK	3 951 858CZK
ANNUAL CHANGE					
January	February	March	April	May	June
-23.37%	-54.42%	-60.67%	31.03%	16.20%	102.13%

Source: Authors

The line chart in Figure 4 illustrates the trend in sales/revenues in the food segment. The year 2021 in this segment was less profitable than 2022, with a difference of about 150 thousand CZK. June saw the highest sales volume, where the blue peak exceeded the orange curve, caused by the change in the product portfolio and promotional offers, profoundly stimulating sales growth.

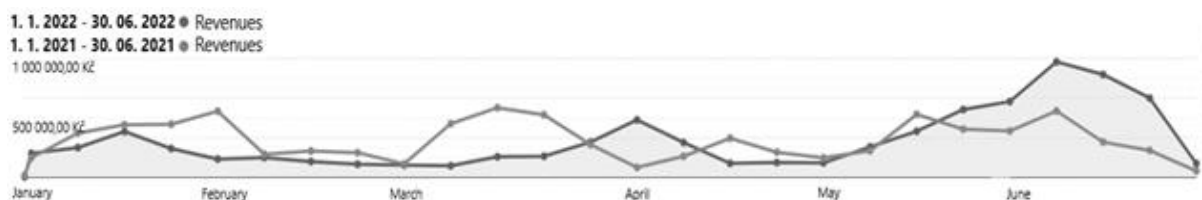


Figure 4. Sales/revenues trend: E-shop 2: Manufacturing and selling food products.

Source: Authors

Over the first two quarters of 2021 and 2022, the year-on-year comparison of the number of transactions and sales/revenues was a variance of approximately 12.94%, which is due to the same factors as the variance for E-shop 1, with the most significant factor being the increase in average order value by adding more expensive (and complementary) products to the portfolio.

Figure 5 shows a year-on-year decrease of 15.14% in sales/revenues for women and an increase of 38.81% for men. The company added more gift items for women sought-after by men to its product portfolio. These were mainly promotions to buy gifts on International Women's Day, Mother's Day, and others.

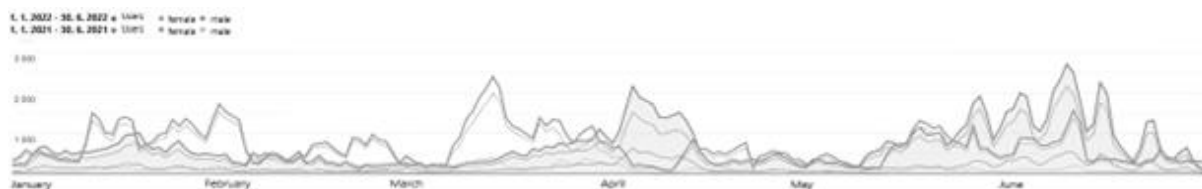


Figure 5. Sales/revenues trend by gender: E-shop 2: Manufacturing and selling food products.

Source: Authors

Figure 6 shows the year-on-year transactions and sales/revenues within NUTS-3 regions. The Zlín Region achieved the highest growth (30.40%), while the Hradec Kralove Region (-20.69%) and the Karlovy Vary Region (-24.71%) witnessed the sharpest slump. The Prague Region saw a significant sales increase of 8.01%. The Central Bohemian Region, the South Bohemian Region, the Liberec Region, the South Moravian Region

and the Vysocina Region fluctuate between 4% and -4%. The remaining five regions (Plzen Region, Moravian-Silesian Region, Pardubice Region, Olomouc Region, and Usti nad Labem Region) oscillate from -14% to -19%.

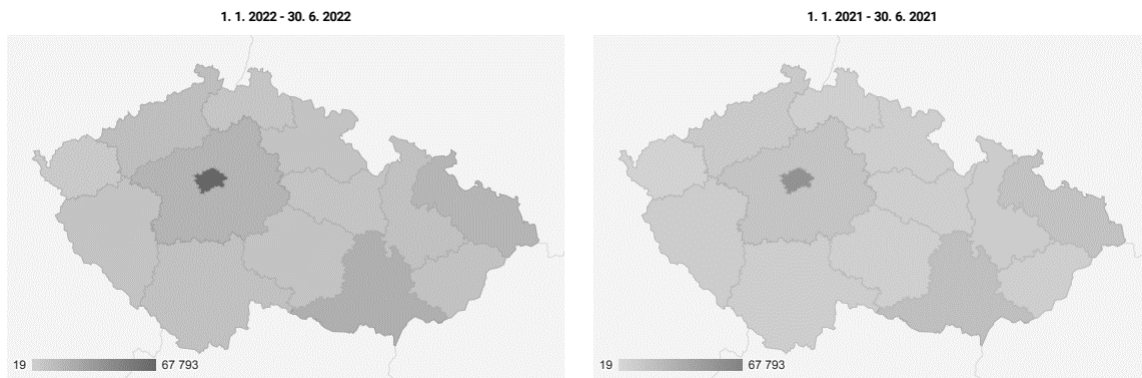


Figure 6. Map Overlay: E-shop 2: Manufacturing and selling food products.

Source: Authors

Another examined e-shop is a company that manufactures and sells headwear and fashion accessories. Table 4 shows the decrease in year-on-year change for all six reference months, referred to as 'red numbers'. The highest drop was recorded in March when the e-shop reached negative numbers, generating lower sales than the previous year, stemming from unfavourable economic conditions such as higher inflation, fear, and uncertainty about future developments when people were saving and hesitating to buy things. Also, the company did not benefit from the closure of brick-and-mortar stores in 2021 due to the change in the shopping environment from traditional brick-and-mortar stores to the online environment. As a result of these changes, there was an enormous increase in sales/revenues compared to 2022, when the brick-and-mortar stores reopened, and the business split back into two forms.

Table 4. E-shop 3: Manufacturing and selling headwear and fashion accessories.

E-SHOP 2					
REVENUES 2021					
January	February	March	April	May	June
898 878CZK	686 817CZK	686 817CZK	570 813CZK	595 172CZK	666 302CZK
REVENUES 2022					
January	February	March	April	May	June
716 178CZK	557 951CZK	433 776CZK	468 153CZK	538 940CZK	590 061CZK
ANNUAL CHANGE					
January	February	March	April	May	June
-20.33%	-18.76%	-36.84%	-17.98%	-9.45%	-11.44%

Source: Authors

The line chart of the e-shop sales/revenues 3 is, on average, 19.13% lower than in the first six months of 2022, see Figure 7. This sector is also affected by adverse economic conditions, where people prefer buying basic goods over superfluous ones, including fashion accessories.

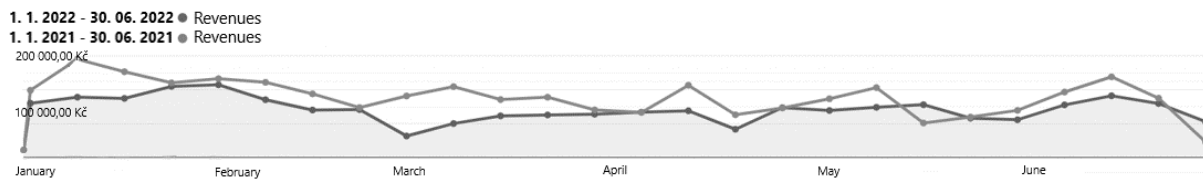


Figure 7. Sales/revenues trend: E-shop 3: Manufacturing and selling headwear and fashion accessories

Source: Authors

A comparison of the year-on-year number of transactions and sales/revenues over the whole reference period shows a correlated trend with a year-on-year variation of 4.4%. This deviation is mainly due to a decrease in the average value of orders caused by the preference for cheaper goods over luxury or premium goods. Another reason involves a change in the product portfolio caused by supply chain shortages, etc.

The sharpest decrease in sales/revenues, see Figure 8, can be observed in the women's segment, by an above-average 31.87%, and in the men's segment, by an overall decrease of 3.52%. The decline in women's interest in the goods is due to the poor choice of products, which means a drop in supply compared to 2021.

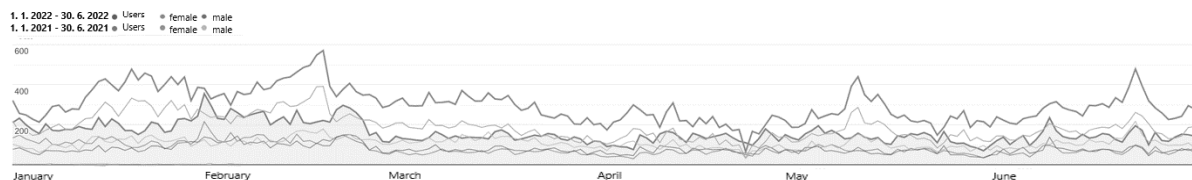


Figure 8. Sales/revenues trend by gender: E-shop 3: Manufacturing and selling headwear and fashion accessories.

Source: Authors

For the NUTS-3 regions, the steepest drop in sales/revenues was observed in the Hradec Kralove Region, whose values decreased year-on-year by 46.59% (see Figure 9). A high decline was also recorded in the Plzen Region (39.18%) and the Usti nad Labem Region (35.10%). Only the Karlovy Vary Region made an average year-on-year increase of 14.38%. The remaining ten regions experienced an annual decrease from 30% to 1% (Figure 9).

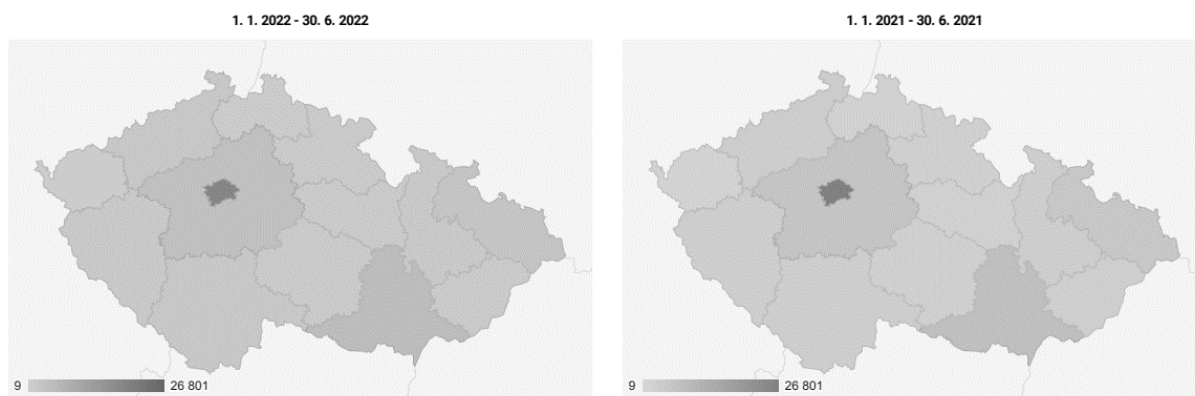


Figure 9. Map Overlay: E-shop 3: Manufacturing and selling headwear and fashion accessories.

Source: Authors

The last studied e-shop is the jewellery manufacturing and sales division, illustrated in Table 5. February recorded the sharpest decrease of 44.24% in year-on-year change, while January indicated the slightest downturn of 15.35%. The reason for such a decline is similar to E-shop 3, i.e., adverse economic conditions and closed brick-and-mortar stores where people preferred bread and butter stuff.

Table 5. E-shop 4: Manufacturing and selling jewellery.

E-SHOP 4					
REVENUES 2021					
January	February	March	April	May	June
2 151 040CZK	2 119 729CZK	2 015 849CZK	2 115 185CZK	1 903 302CZK	1 352 837CZK
REVENUES 2022					
January	February	March	April	May	June
1 820 818CZK	1 181 891CZK	1 496 414CZK	1 422 055CZK	1 154 697CZK	1 071 699CZK
ANNUAL CHANGE					
January	February	March	April	May	June
-15.35%	-44.24%	-25.77%	-32.77%	-39.33%	-20.78%

Source: Authors

The sales/revenues in 2021 increased by CZK 3.5 million compared to the following year, see Figure 10. In the line chart, see Figure 10, the blue curve with an average decrease of 30% correlates with the orange. The comparison of the year-on-year number of transactions and sales/revenues for the whole reference period of 2021 and 2022 shows a deviation of about 12.34%, mainly caused by the change in the average value of orders that increased due to reframing the e-shop pricing policy and the product portfolio or the fluctuating conversion rate.

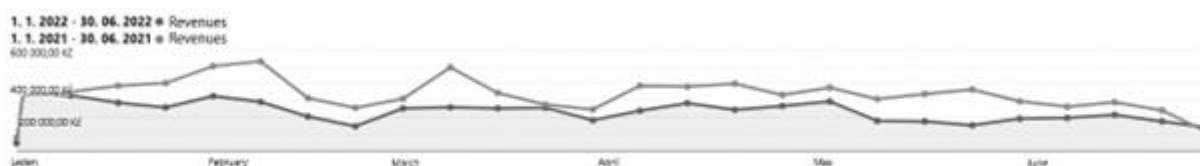


Figure 10. Sales/revenues trend: E-shop 4: Manufacturing and selling jewellery.

Source: Authors

This segment's sales/revenue trend reflects women's waning inclinations, as seen in Figure 11, which recorded a 40.95% year-on-year decline in sales. A year-on-year decrease also indicates the men's flagging interest, plummeting to 24.05%. For men, the decline in sales was less significant than for women, buying products only as gifts.

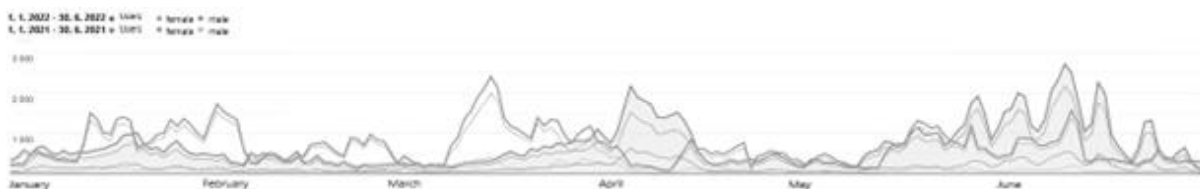


Figure 11. Sales/revenues trend by gender: E-shop 4: Manufacturing and selling jewellery.

Source: Authors

The South Bohemian Region recorded an increase of 18.94% in the year-on-year change of transactions and sales/revenues within NUTS-3 regions, see Figure 12. The steepest year-on-year decrease in sales/revenues was identified for the Vysocina Region (47.32%) and the Plzen Region (45.38%). A slide in sales/revenues ranged from 40% to 20% for the other remaining regions. Furthermore, we identified a non-detectable value in the measurement data, caused by different reasons, e.g., unconfirmed cookie bar, enabled incognito browsing mode, or third-party software, so-called "is not set", showing a year-on-year increase of 627.36%.

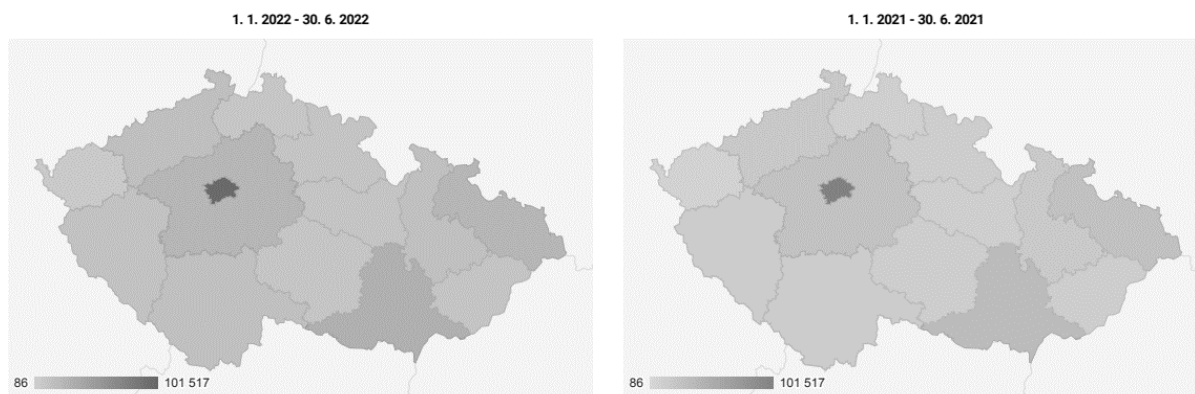


Figure 12. Map Overlay: E-shop 4: Manufacturing and selling jewellery.

Source: Authors

Discussion

The initial reference period defined by the COVID-19 pandemic gave way to another period of energy and resource crisis and the war in Ukraine. This reality shows both the necessity of the issues discussed and the all-society importance that continues to grow in the present time. We set two research questions, taking into account the outcomes of the solution and providing the following comments. The first question:

- Research question 1: Which segments were most adversely affected by the COVID pandemic and the Russia-Ukraine war in the first six months of 2021 and 2022?

The results showed that buying behaviour in 2022 suffered the consequences of the COVID-19 pandemic of previous years or the uncertain environment in segments such as the labour market, energy market, etc. These fundamental reasons have made customers think more about their purchase options. It is also important to mention that the year-on-year changes could reflect marketing events like a sale or a product discount. These events could distort the trend and temporarily increase the year-on-year turnover in this period, although the e-shop has been loss-making for a long time. It is essential to set the figures in the proper context. Pollak & Konecny (2021) also concluded that the global COVID-19 pandemic seriously disrupted traditional supplier-customer relationships, forcing e-shops to change their behaviour. Companies had to move their offline trading to the online environment. According to Švecová et al. (2020), the share of e-commerce was increasing, and buying food, ready meals or medicaments was growing. In general, many purchases would move more to the online environment, which is the case.

Figure 13 below illustrates the average year-on-year sales/revenues for each analysed e-shop. The curve indicates the overall average of all studied e-shops in terms of demographics. The percentages on the left represent the men's segment trend, while the right side refers to the women's preferences. The steepest decrease in sales/revenues can be observed for women, with an average value of 30.80%, while an increase is apparent for men (2.54%). The radical difference involves women boosting turnover, whereas men buy only gift items. For example, E-shop 3 saw its supply chain disrupted because of product shortages, especially the women's assortment. According to Švecová et al. (2020), consumers have also started to favour healthy, safe, and sustainable products, which was encouraged by the pandemic and the change in consumer thinking. Socio-economic crises will still have a long-term impact on shopping, including consumer behaviour. The typical new behaviour in a crisis period is saving money and reconsidering purchasing decisions, especially for luxury goods. On the contrary, buying sustainable or healthier products will be prioritised.

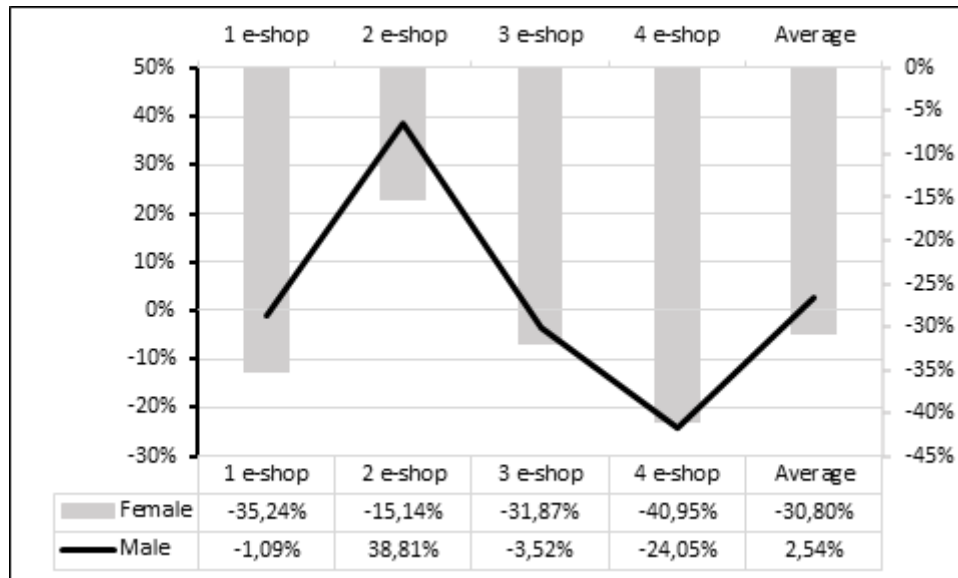


Figure 13. Impact of crisis situations on the demographic breakdown of the segments studied.

Source: Authors

In line with the research results, question 2 (below) can be answered as follows.

- Research question 2: Can a one-third drop in sales/revenues be expected in the e-commerce sector over the two quarters of 2021 and 2022?

The average decline in sales/revenues for the first two quarters of 2021 and 2022 were identified in the cosmetics segment, reaching 24%, followed by the fashion industry at 19% and the jewellery industry at almost 30%. On the other hand, an average year-on-year increase in sales/revenues was identified in the food industry (1.82%), see Table 6. E-shop 1 saw the sharpest average decrease in sales/revenues (cosmetics) due to the post-COVID crisis and other economic conditions. People did not spend money on more expensive high-quality cosmetics, preferring readily available products. E-shops 2 and 3 (fashion and jewellery) also witness an average decrease in year-on-year sales/revenue, affected by adverse economic conditions such as inflation, fear, and uncertainty about the future, making people resort to basic and life necessities. E-shop 2 (cosmetics) was the only one with increased average sales/revenues year on year. Sales in this segment involved physical stores and e-commerce, and the quick response of the e-shop owner and management to the slump in the first two quarters of 2022 affected the sales trend. The company has introduced attractive promotional offers, including new additions to its product portfolio. Lower prices have driven customers' motivation to make purchases.

Table 6. E-shop 4: Manufacturing and selling jewellery.

ANNUAL CHANGE							
	January	February	March	April	May	June	AVERAGE
E-SHOP 1	-1.37%	-50.79%	-30.40%	-14.48%	-39.79%	-5.66%	-23.75%
E-SHOP 2	-23.37%	-54.42%	-60.67%	31.03%	16.20%	102.13%	1.82%
E-SHOP 3	-20.33%	-18.76%	-36.84%	-17.98%	-9.45%	-11.44%	-19.13%
E-SHOP 4	-15.35%	-44.24%	-25.77%	-32.77%	-39.33%	-20.78%	-29.71%

Source: Authors

We argue (Agus et al., 2021) that none of the companies studied benefits from closing brick-and-mortar stores in 2021. There was a disproportionate growth in sales/revenues compared to the following 2022 (physical stores opened), and sales/revenues were split between the offline and online environments. The outbreak of the

COVID-19 pandemic in the first quarter of 2020 significantly drove e-commerce growth. Lockdowns were introduced in many European countries, leading to a shift from physical to offline shopping. Consumer behaviour has changed, and businesses have responded by adopting more advanced technologies towards digital transformation. There has also been a significant change in the age structure of consumers, especially the older generation, and their preferences associated with digital literacy and marketing promotions, especially for healthy and sustainable goods (Gavurova et al., 2024). The research study by Stofkova et al. (2022) confirms the above conclusion but also points out that SMEs and the implemented measures related to the COVID-19 pandemic and other economic crises have affected both - businesses and consumer buying behaviour.

Conclusions

In line with the set objective of the paper and research questions, we formulate the following findings concerning the issue. The goal of the paper was to describe the development of selected Czech segments in e-commerce for the period from the first half of 2021 to 2022 and evaluate the adverse effects of the COVID-19 pandemic and other economic crises, which recently have shown the business sector that digitisation and shift to the online environment can play a leading role in maintaining and developing business activities. The research provided valuable data on the development of e-commerce. The selected method allowed answers to the research questions.

Besides making a profit, the main goal of all small and medium-sized enterprises is to optimise warehousing and logistics costs. The massive growth that e-commerce has achieved in recent years reflects the improvement in customer service and speed of delivery, which is the way to win customer loyalty. E-commerce personalisation enables the formulation of consumer preferences, pre-selection of their favourite categories, and selection of current offers and discounts. E-shops can use the obtained data for further analysis concerning the implementation of strategic marketing. Correct and systematic data analysis can help tailor offers, discounts and other additional services to potential customers.

Our research has the following limitations: applying the proposed methods to one selected country from the first half of 2021 to 2022; the study can fall into the category “is not set”, which appeared in the geographical breakdown of regions according to NUTS 3. It is an unmeasurable data point caused by an unconfirmed cookie bar, an anonymous mode enabled in the browser, or third-party software. The presented research is unique, as no other survey on NUTS 3 regions has occurred in the Czech Republic.

The pandemic taught the Czech public to largely use online shopping, which applies to older generations, too. With the opening of the retail market, online sales growth has slowed down slightly compared to previous months but will grow in the future. As part of their consumer behaviour, people increasingly prefer this form of shopping, and brick-and-mortar stores will see fewer customers than before the pandemic. A promising solution is to combine offline and online stores. Retailers without online businesses will be trying to launch or develop their e-shops. Existing e-shops will continue their activities by building distribution points (showrooms). For these reasons, the share of e-commerce in total retail sales will continue to grow in the following years. Online shopping is becoming increasingly popular even with the older generation, who had to change their consumer habits due to the pandemic, and their purchases consist mainly of medicines, food, and furniture.

The research implies that technological readiness, openness to innovation, information capabilities, and technology will convince small and medium-sized enterprises to adopt e-commerce. Small and medium-sized enterprises with higher levels of knowledge and practical skills, flexibility and varied business activities will gain significant competitive advantages by implementing e-commerce compared to enterprises that have not adopted this form of business. The paper also presents the outcomes from the first part of the research. The follow-up research will analyse selected Czech e-shops and their impact in the current, more challenging crisis than the COVID-19 pandemic.

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Kristína KORENÁ works at the Department of Tourism and Marketing at the Institute of Technology and Business in České Budějovice, Czech Republic. Research interests: regional and territorial development and new trends in marketing communication.

ORCID ID: <https://orcid.org/0000-0001-9402-1985>

Petra PÁRTLOVÁ is Associate Professor at the Department of Tourism and Marketing of the Institute of Technology and Business in České Budějovice, Czech Republic. Research interests: external environment and sustainability and profit of small and medium-sized businesses in the Czech Republic.

ORCID ID: <https://orcid.org/0000-0003-2404-6073>

David VYŠÍN is a marketing specialist, Pehantia Ltd. Focuses on Facebook advertising and planning and auditing e-commerce marketing strategy with the goal of performance sales and brand building.

ORCID ID: <https://orcid.org/0009-0004-5076-9931>

Vít KLUGER is a student at the Department of Business and Finance, Czech University of Life Sciences Prague. Research interests: International relations, foreign policy, business economics, consumer economics, transportation systems, mobility.

ORCID ID: <https://orcid.org/0000-0003-3514-1084>

Michal RUSCHAK is a student at the College of Entrepreneurship and Law, Pan-European University, Prague. Fields of scientific interests: marketing, communication, business, CSR.

ORCID ID: <https://orcid.org/0000-0002-8896-4765>

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