

FINANCIAL PERFORMANCE OF BUSINESSES IN THE COVID-19 PANDEMIC CONDITIONS – COMPARATIVE STUDY

Kubiczek J., Derej W.*

Abstract: The outbreak of the coronavirus pandemic introduced exceptional uncertainty in running a business, which has not been closed in the first quarter of its duration. Industries that focused on digitalizing business naturally benefited because the restrictions that were introduced to limit the spread of the pandemic implied demand for the purchase of products and services using the Internet. The aim of the study was to present the influence of the pandemic on business in Poland. The focus was not only on the economy as a whole but especially on its particular segments. The subject of the study were companies listed on the Warsaw Stock Exchange, and the subject of them was the impact of the pandemic on their financial results. The source of data for analyzes was the database of the Notoria Serwis S.A. The period of the study covered the years 2017-2021, divided into quarters. The results of the study showed that there is significant variation in the sensitivity of particular industries to the crisis caused by the COVID-19 pandemic. Most industries recorded a decline in revenues, but some branches did not show negative changes in this respect and those whose revenues increased. The study's practical implications include the prospect of applying the findings of the analyses to future state protective measures in respect to industries that are most vulnerable to the crisis' negative effects.

Key words: business, entrepreneurship, COVID-19, crisis management, pandemic crisis.

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Introduction

Periods of intense growth are a natural feature of economic development and periods of slowdown that may take the form of a crisis. Crises differ in terms of the scale of their impact and the cause of their occurrence. Entrepreneurs in the 21st century have experienced many crises – from the shock in the economy caused by the attacks on the World Trade Center, through the financial crisis of 2007-2009, or the ongoing situation caused by the COVID-19 pandemic. Managers face numerous decision-making challenges during the crisis, the majority of which affect the company's strategic directions and boil down to guaranteeing the company's long-term viability (Dyduch et al., 2021).

The operatable environment obviously influences decision-making and business practices. Many researchers have emphasized the turbulence of the external

* **Jakub Kubiczek**, Department of Economic and Financial Analysis, University of Economics in Katowice, Katowice, Poland; **Wojciech Derej**, Department of Labour Market Forecasting and Analysis, University of Economics in Katowice, Katowice, Poland

✉ corresponding author: jakub.kubiczek@edu.uekat.pl

✉ wojciech.derej@edu.uekat.pl

environment in recent years (Camillus & Datta, 1991; Hahm et al., 2013; Naidoo, 2010). However, the pandemic has occurred unexpectedly, and thus economic implications were hardly predictable (Kubiczek, 2021). The COVID-19 pandemic's impact can be described as two-fold: besides being unexpected, it also was far-reaching (Madeira et al., 2021; Sharma et al., 2020).

Governments have introduced restrictions to limit the spread of the coronavirus, which have often been associated with limitations on the current form of activity (Kubiczek & Derej, 2021). Moreover, the employers themselves started virtualizing their activities, e.g. introducing remote work (Brynjolfsson et al., 2020). Nevertheless, it should be noted that although practitioners and researchers strive to optimize the management of uncertainty in international business, there are no universal rules for crisis management. This results from the fact that the sectors' details are varied, but each business has its distinctive features. As a result, it is the role of managers to identify the types of uncertainties that exist in their enterprises and determine the best solutions for coping with the COVID-19 pandemic effects (Sharma et al., 2020).

Although more and more studies on economic activity are being published during the pandemic period, the scale of its impact has implied a form of further research in this area. Therefore, the research gap in this study has been defined as insufficient knowledge on business and entrepreneurship during COVID-19 pandemic.

The aim of the study is to present the impact of the pandemic on business in Poland. In order to achieve it, the following research questions were posed:

1. What is the sensitivity of industries to the economic slowdown caused by the COVID-19 pandemic?
2. Which economic sectors have suffered the most and have been least affected by economic restrictions caused by the pandemic situation?
3. In which quarters of the year the particularly negative impact was observed?

Literature Review

Recessions are a part of the economy's natural cycle, although not every recession is a crisis. However, the situation shaped by the COVID-19 pandemic can be called a crisis because it meets its definition. According to the previous study (Vardarli, 2016) a crisis can be defined as "a total disruptive event to a partial disruption where people, property, equipment or the environment". During a crisis, managers have to make dozens of new pivotal decisions that could shape a company's future (Wolbers et al., 2018).

The source of the crisis may be different and may determine its type, among which the following aspects can be distinguished: "natural, technological, confrontation, malevolence, skewed management values, deception, management misconduct, business and economic" (Cutlip et al., 2006). Although world literature has been discussing ways to deal with a crisis for years, each successive crisis is different from the previous one (Butler & Sullivan, 2005). There is no one-size-fits-all strategy for overcoming a crisis (Christensen et al., 2016).

Efficient management in a crisis not only ensures the possibility of effective competition but above all, ensures above-average performance in a turbulent environment (Dyduch et al., 2021). A crisis may be a factor accelerating changes in business, and the ability to implement them may prove to be the basis for a competitive advantage in the long term (Penrose, 2000; Grofcikova, 2020). Penrose (2000) stresses that the mere perception of a crisis may imply certain behaviors – “crises are not inherently good or bad; they are merely perceived by most as bad”. It should be stated that a crisis can be perceived both as a threat and as an opportunity, and the perception can generate certain behaviors (Christensen et al., 2016). Furthermore, perceiving a crisis as a threat may distort the perception of managers and result in emotional decisions (Penrose, 2000).

Even in such a circumstance, firms could endure and thrive in the rapidly changing unfavorable external conditions by adapting their strategies effectively to them (Köksal & Özgül, 2007). The crisis can also be seen as an opportunity to consider introducing new solutions as well as alternatives to the existing ones. Penrose (2000) points out that proactive planning and immediate reaction to changes prove to be effective in such a situation. Enterprises in the event of a crisis should adapt to changes. First of all, managers should respond to signals of changes in consumer behavior and expectations (Köksal & Özgül, 2007; Mach-Król & Hadasik, 2021).

One of the effects of the crisis is increases in prices, which generate higher operating costs. In turn, it implies – among market participants – decision dilemmas that usually take two variants: raising prices or maintaining prices at the current level to be competitive (Köksal & Özgül, 2007). In order to avoid insolvency, businesses must cut wages and employees, including at the management level. Searching for savings can also manifest at stopping or even ceasing investment projects (Zehir and Savi, 2004, pp. 346-47).

Researchers emphasize that cutting costs, production, investment, entering foreign markets, working more intensively with equity capital and improving efficiency or re-structuring debt will have no positive impact on performance unless companies grow sales (Köksal & Özgül, 2007).

COVID-19 Pandemic

During the crisis of 2007-2009, different branches of the economy plunged into crisis with each successive month. After the third quarter of 2009, business slowly returned to the pre-crisis state (Naidoo, 2010). The COVID-19 pandemic crisis is a one-of-a-kind instance because of how quickly it swept throughout the world and caused chaos in the global economy (Sharma et al., 2020). This is evidenced by the fact that one of the first steps in many countries was to limit the export of drugs and medical equipment (Evenett, 2020).

The COVID-19 pandemic has caused a health issue while also creating a dramatic decline in economic sustainability activities, notably in tourist management, and has had unquantifiable consequences in most countries (Madeira et al., 2021). Consequently, one of the most affected economies was those directly or indirectly related to tourism (Škare et al., 2021; Sigala, 2020; Jaipura et al., 2020). For

instance, the small business sector in Malaysia is one of the most affected by the movement's control order (Fabeil et al., 2020), while in the Portuguese restaurant industry, there are evident worries about future resilience, worry of a lack of suitable government actions, tactics intended for markets with higher immediate availability, and the generation of working capital (Madeira et al., 2021).

Globalization has influenced mobility, healthcare systems and economics. The economic impact was measured based on the workforce, event cancellations, food and agriculture, academic institutions, and supply chain (Shrestha et al., 2020). Such a wide impact of the pandemic forced entrepreneurs to change their business models (Ritter & Pedersen, 2020). Furthermore, the abrupt and unforeseen nature of the pandemic forced enterprises to focus on current activities instead of planned ones, as operational flexibility turned out to be significantly important (Chernogorova et al., 2021).

The COVID-19 pandemic has initiated new trends that may continue (Liu et al., 2021). Getting familiar with customers' expectations made it easier to modify an entrepreneurial strategy on an ongoing basis and gain a competitive advantage during the COVID-19 pandemic (Ahmed et al., 2020). Entrepreneurs mainly respond to changes in consumer behavior (Fonseca & Azevedo, 2020; Zrałek & Burgiel, 2020), especially in the digitization of consumption (Dementiev, 2021; Maciejewski et al. 2021). Kuc-Czarnecka (2020) emphasizes that during the pandemic, a great global change took place in life, work and socialization, which forced digital integration.

In some countries, such as Germany, the lockdown during the first wave of coronavirus, there was a little transition from grocery to e-grocery (Dannenberg et al., 2020). Using the example of the USA, notice that the development of the e-grocery market during the pandemic was caused by the increase in the potential group of recipients (Hamidi & Zandiataashbar, 2021). A similar message of the growth of this market was observed in Oman (Al-Hawari et al., 2021) and Indonesia (Hartono et al., 2021). Another aspect was not only changing the form of purchases but also the type of food ordered (Loske, 2020).

As a result, the situation of agricultural businesses has changed dynamically (Lin & Zhang, 2020) – noting the growth of such segments. Moreover, not only in the agricultural business segment, various effects of the pandemic were recorded, i.e. area of activity and enterprise size.

Analysis of running a business during a pandemic show that working together gives better results (Crick & Crick, 2020). Enterprises in the local market know its specifics better and are able to take into account the expectations of stakeholders, which leads to a better adaptation of their offer to the reported demand. Companies that operate on an international scale and cooperate with local entrepreneurs, having understood this issue, achieved better results (van Assche & Lundan, 2020). Supply chains have become shorter and more nationalized then. Some industries were forced to localize their supply chains and nationalize their production and sales as a result of COVID-19 (Alon, 2020). However, it should be noted that each market is different, and the activity in it is different.

In the Polish SME sector, dynamic capabilities were essential for businesses to survive during this unexpected black swan event, which resulted in employee retention, production levels and maintaining cash flow and current revenues (Dyduch et al., 2021). The speed and efficiency of management, as well as adapting to impulses triggered by government policy, were crucial to achieving better competitiveness. It should also be noted that during the pandemic, new areas for potential activity were created, which were used not only by currently functioning enterprises but also by start-ups. Particular changes in the current activity of companies were observed in the following sectors: food, medicine, energy and oil, technology and telecommunications (especially 5G) (Alon, 2020).

Sources of financing for their operations had become particularly important because when the COVID-19 pandemic outbreak, the world came to a halt, and the possibilities of raising capital changed. First of all, the situation of the banks has changed, as they have endured the crisis differently. Therefore, active regulation policy conducted by central banks turned out to be crucial (Bernardelli et al., 2021). The second channel was government policy, mainly in the area of fiscal policy. Governments were forced to rollout relief policies to aid businesses and reduce financial losses because of combat economic losses and complete economic shutdown (Barczyk & Urbanowicz, 2021). Furthermore, stimulus programs are already implemented in many countries of the world to assist businesses in preparing for the next harsh financial winter. In Poland, the government prepared financial aid for entrepreneurs under the name of “anti-crisis shield”. There are many different types of it and the scope of financing, which causes intricacy and reduces the effectiveness of aid (Kubiczek & Derej, 2021). The Polish Economic Institute (2021) reports that the total amount of support under the anti-crisis shields in 2020 amounted to PLN 162.9 billion, which is 51.8% of the funds spent from the budget of PLN 314 billion planned by the government allocated to the several editions and different types of the so-called “anti-crisis shields”.

Different market segments have reacted differently to the COVID-19 pandemic. Lockdown and sanitary restrictions had long-term effects on various economic sectors, and often companies also had to react dynamically by changing their development strategy, adapting to unpredictable and harsh situations. Further scientific steps that would need to be taken would be to identify the degree and the dimensions of changes to which individual market segments had to adapt. Specific industries should be further analyzed in the context of their financial fluctuations during a pandemic, including examples of companies that mirror the entrepreneurial behavior of a given sector.

Methodology

As part of the analysis, the revenues of companies listed on the Warsaw Stock Exchange (WSE) on the main and parallel markets were compared. The analysis of revenues follows this element of business performance that illustrates changes in demand implied by the external situation, including restrictions on economic activity

caused by the pandemic. The rationale for selecting the subjective scope of the research is the availability of quarterly data due to the reporting obligations of companies present on the WSE. On the other hand, the time scope of the analysis is dictated by the development of the pandemic and, consequently, subsequent lockdowns that inhibit economic activity in the following quarters. The first lockdown was introduced in Poland at the beginning of the second quarter of 2020. Hence it can be expected that the comparison of companies' results in 2020 compared to 2019. As in the case of individual quarters, it may show the impact of the crisis caused by the pandemic. The analysis covered the period from 2017 in order to take into account the trend of the results. In other words, if an industry is in a downtrend, any deterioration in performance may not necessarily be a direct consequence of the pandemic crisis. For the analysis, a variable related to company revenues was adopted as the element of business performance that can best reflect the susceptibility to changes in the market situation.

The scope of the research covered companies listed on the WSE; the scope of the research covered their sales revenues, while the time scope covered the period Q1 2017 – Q2 2021. Initial selection for the availability of quarterly reports for Q1 and Q2 in 2021 showed the lack of availability of some data for the second quarter of 2021, and in some cases, also for the first quarter of 2021. Therefore, a list was prepared based on the available data from Q1 2017 to Q1 2021. Moreover, the list does not include companies, which are not assigned to a specific industry and banks due to a different format of the presented quarterly data. Ultimately, the results of 608 companies grouped into 40 industries were examined (Table 1).

Table 1. Selected industries for the analysis of the impact of the crisis caused by the COVID-19 pandemic

| No. | Industry | No. | Industry |
|-----|-----------------------------|-----|--------------------------------|
| 1 | groceries | 21 | real estate |
| 2 | biotechnology | 22 | new technologies |
| 3 | construction | 23 | clothing and cosmetics |
| 4 | chemistry | 24 | fuel and gas |
| 5 | wood and paper | 25 | financial intermediation |
| 6 | heat and water distribution | 26 | drug production |
| 7 | drug distribution | 27 | electromechanical industry |
| 8 | investment activity | 28 | recycling |
| 9 | energy | 29 | recreation and relaxation |
| 10 | finance - other | 30 | capital market |
| 11 | mining | 31 | commercial networks |
| 12 | games | 32 | medical equipment and supplies |
| 13 | rubber and plastics | 33 | hospitals and clinics |
| 14 | trade and services - other | 34 | telecommunication |
| 15 | internet commerce | 35 | transport and logistics |
| 16 | metallurgy | 36 | insurance |
| 17 | Informatics | 37 | business services |
| 18 | leasing and factoring | 38 | receivables |
| 19 | media | 39 | home furnishings |

| | | | |
|----|------------|----|--------|
| 20 | automotive | 40 | supply |
|----|------------|----|--------|

Source: Own calculations based on (Notoria Serwis, 2021)

The source of the data was information from Notoria Serwis (2021). The stages of the study were as follows:

1. preparation of a quarterly statement of the results of companies listed on the Warsaw Stock Exchange in terms of revenues, broken down by industry;
2. calculation of the percentage changes in revenues of a given quarter in relation to the quarter in the previous year;
3. calculation of descriptive statistics without division into sectors;
4. calculation of the percentage changes in revenues for a given quarter in relation to the quarter in the previous year, broken down by industries;
5. calculation of quartiles of financial results in the second quarter of 2019/2018, 2020/2019;
6. comparison of adherence to quartiles in Q2 2019/2018, 2020/2019;
7. checking the dependence of belonging to quartiles in Q2 2019/2018, 2020/2019.

Results

The first step in the main part of the analysis was the computation of descriptive statistics for simple rates of change, taking into account quarters. The results are presented in Table 2.

Table 2. Descriptive statistics for the analyzed data.

| | Quarter I | | Quarter II | | Quarter III | | Quarter IV | |
|--------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 2019/ 2018 | 2020/ 2019 | 2019/ 2018 | 2020/ 2019 | 2019/ 2018 | 2020/ 2019 | 2019/ 2018 | 2020/ 2019 |
| mean | 8% | 11% | 6% | -2% | 9% | 19% | 2% | 38% |
| Standard deviation | 18% | 30% | 13% | 33% | 21% | 85% | 25% | 107% |
| coefficient of variation | 234% | 281% | 218% | -1513% | 239% | 441% | 1049% | 279% |
| Q1 | 2% | -6% | 0% | -18% | 1% | -5% | -6% | -2% |
| Median | 8% | 3% | 6% | -4% | 5% | 2% | 1% | 9% |
| Q3 | 18% | 16% | 14% | 4% | 15% | 9% | 14% | 19% |
| Quartile deviation | 8% | 11% | 7% | 11% | 7% | 7% | 10% | 10% |

Source: Own calculations based on (Notoria Serwis, 2021)

On average, the analyzed companies in 2019 recorded better revenues than in 2018. However, it can be noticed that in the second quarter of 2020, they recorded decreased revenues due to the accompanying outbreak of the pandemic. Moreover,

the increased differentiation of revenues in the second of the analyzed periods suggests that the pandemic also resulted in greater variability in individual industries. It is worth noting that in the second quarter of 2020, as many as 50% of the analyzed industries recorded a decrease in revenues of less than or equal to 4% compared to the same period in the previous year. During the quarter-by-quarter pandemic, more and more industries reported a decline in revenues compared to the same period in the previous year. In the fourth quarter of 2020, compared to the fourth quarter of 2019, only 25% of the surveyed companies recorded a decrease in revenues of more than 2%, while over 50% of the surveyed companies obtained more than 9%. Table 3 presents the individual percentage changes for individual industries broken down into quarters.

Table 3. Changes in the revenues of selected industries listed on the Warsaw Stock Exchange

| Industry | Quarter 1 | | Quarter 2 | | Quarter 3 | | Quarter 4 | |
|----------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 2019/ 2018 | 2020/ 2019 | 2019/ 2018 | 2020/ 2019 | 2019/ 2018 | 2020/ 2019 | 2019/ 2018 | 2020/ 2019 |
| recreation and relaxation | 18% | 1% | 19% | -65% | 18% | -47% | 18% | -53% |
| Financial intermediation | 40% | -27% | 32% | -40% | 44% | 0% | 48% | 9% |
| receivables | 2% | 2% | 0% | -39% | 8% | 7% | -22% | 91% |
| fuel and gas | 14% | -2% | 1% | -39% | -3% | -25% | 0% | -26% |
| transport and logistics | 9% | -15% | 0% | -35% | 1% | -32% | -17% | -15% |
| leasing and factoring | -36% | -21% | -31% | -33% | -38% | -1% | -35% | -9% |
| media | 4% | -11% | 3% | -29% | 7% | -7% | 16% | -11% |
| recycling | 2% | 8% | -5% | -28% | 3% | 3% | 2% | -3% |
| electromechanical industry | 4% | -11% | 8% | -24% | -1% | -16% | -25% | -10% |
| home furnishings | 8% | -6% | -1% | -19% | 1% | 16% | -1% | 16% |
| metallurgy | -5% | -1% | 0% | -18% | -3% | -8% | -3% | 5% |
| wood and paper | 4% | -1% | -3% | -17% | -3% | -9% | -4% | -1% |
| chemistry | 22% | -9% | 3% | -15% | 1% | -6% | -10% | 6% |
| trade and services – other | 2% | -4% | 25% | -15% | 11% | -7% | -3% | 0% |
| hospitals and clinics | 10% | 9% | 21% | -14% | 19% | -1% | -4% | 2% |
| clothing and cosmetics | 24% | -23% | 11% | -13% | 14% | 2% | 21% | -21% |
| mining | 19% | -9% | 6% | -12% | 2% | -5% | -6% | 14% |
| automotive | 21% | -8% | 7% | -11% | 10% | 6% | -8% | 16% |
| finance – other | 45% | 22% | 13% | -5% | 21% | 8% | 33% | 15% |
| drug distribution | -1% | 23% | 12% | -4% | 7% | 15% | 10% | 12% |

| | | | | | | | | |
|--------------------------------|------|------|------|-----|------|------|------|------|
| heat and water distribution | 2% | 4% | 4% | -4% | 86% | -44% | -82% | 539% |
| new technologies | -41% | 56% | -19% | -2% | -30% | 9% | 31% | 19% |
| business services | 2% | 4% | 4% | -2% | 4% | 0% | -2% | 3% |
| medicine production | 1% | 16% | 1% | 0% | 3% | 5% | 4% | 22% |
| construction | 9% | -6% | -1% | 0% | 1% | -3% | -15% | 17% |
| telecommunication | 9% | 1% | 6% | 0% | 4% | 1% | 2% | 4% |
| groceries | 3% | 18% | 7% | 0% | 5% | 7% | 9% | -10% |
| Insurance | 8% | 5% | 6% | 2% | 9% | 2% | 10% | -1% |
| commercial networks | 10% | 13% | 15% | 2% | 10% | 10% | 10% | 8% |
| supply | 2% | 3% | 1% | 4% | 3% | -1% | -2% | 14% |
| energy | 16% | 12% | 21% | 5% | 11% | 4% | 13% | 5% |
| rubber and plastics | 2% | 1% | 0% | 5% | -14% | 23% | -11% | -30% |
| Informatics | 15% | 16% | 10% | 7% | 20% | 6% | 11% | 17% |
| investment activity | -19% | 34% | 15% | 13% | 27% | 6% | 37% | 19% |
| real estate | 28% | 2% | -14% | 13% | -10% | 13% | 8% | 33% |
| e-commerce | 25% | 29% | 10% | 38% | 33% | 36% | 17% | 24% |
| biotechnology | -5% | 31% | 16% | 49% | 0% | 499% | -40% | 193% |
| capital market | -36% | 122% | -21% | 73% | -12% | 50% | 15% | 48% |
| medical equipment and supplies | 31% | 31% | 33% | 91% | 17% | 195% | -4% | 225% |
| games | 40% | 115% | 27% | 97% | 56% | 60% | 71% | 338% |

Source: Own calculations based on (Notoria Serwis, 2021)

The decrease in revenues in the analyzed industries in 2020 compared to 2019, especially in the context of Q2, is a natural consequence of the lockdown situation and restrictions in the field of work, movement and economic activity. Restrictions in the field of tourism activities resulted in the largest decrease in the entire ranking, at the level of 65%, while restrictions in movement resulted in a decline in the fuel and gas sectors (-38.5%) as well as transport and logistics (-34.9%). In addition, the restrictions in traditional trade resulted in a drop in turnover by more than ten percent in such industries as home furnishings, clothing and cosmetics, or other trade and services. At the same time, there is a group of industries that have not significantly changed their turnover, such as food products, which, as basic necessities, showed independence from the external situation (+ 0.5%).

Despite the crisis situation caused by numerous restrictions on economic activity, market segments have also recorded significant gains. These are IT-related industries, i.e. IT (+6.6%), e-commerce (+37.6%) and games (+97.3%), as well as medical equipment and materials (+90.8%).

The list of direct differences in the second quarters of 2020/2019 and 2019/2018 is shown in Fig. 1.

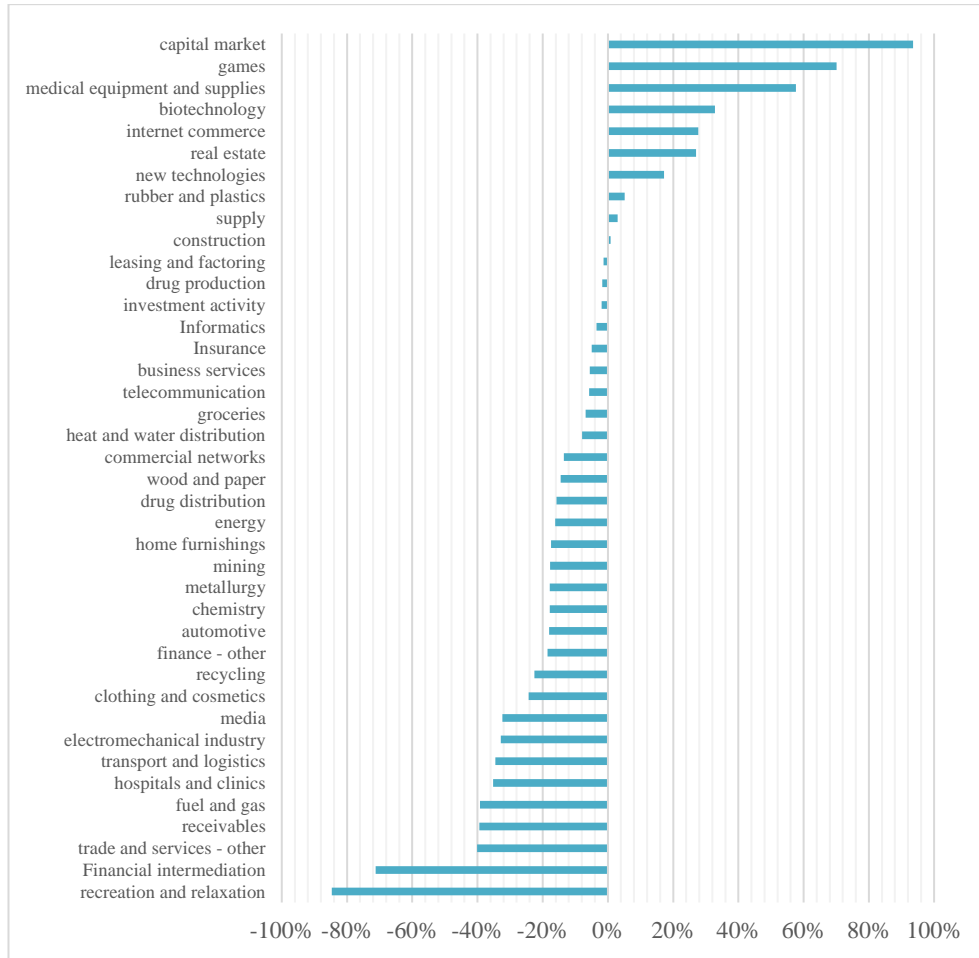


Figure 1: The range of changes in industry revenues in the second quarter in 2020 vs 2019 and 2019 vs 2018
(Own calculations based on Notoria Serwis, 2021).

The levels of variation in revenue changes indicated in Fig. 2 confirm the earlier observations in Table 3, pointing to the differentiation of the impact of the crisis caused by the COVID-19 pandemic on individual industries. While comparing the sectors of the capital market and games with the sectors of recreation and leisure (84.6 pp.) and financial intermediation (71.3 pp.), it can be noticed that they are at two different poles with a similar strength, but a different direction of the impact of the crisis. The industries that recorded the highest increases in revenues include the capital market (93.6 pp.), Games (70.1 pp.) and medical equipment and materials (57.6 pp.). Fig. 2 shows the changes in revenues in the second quarter of the year in 2018-2020.

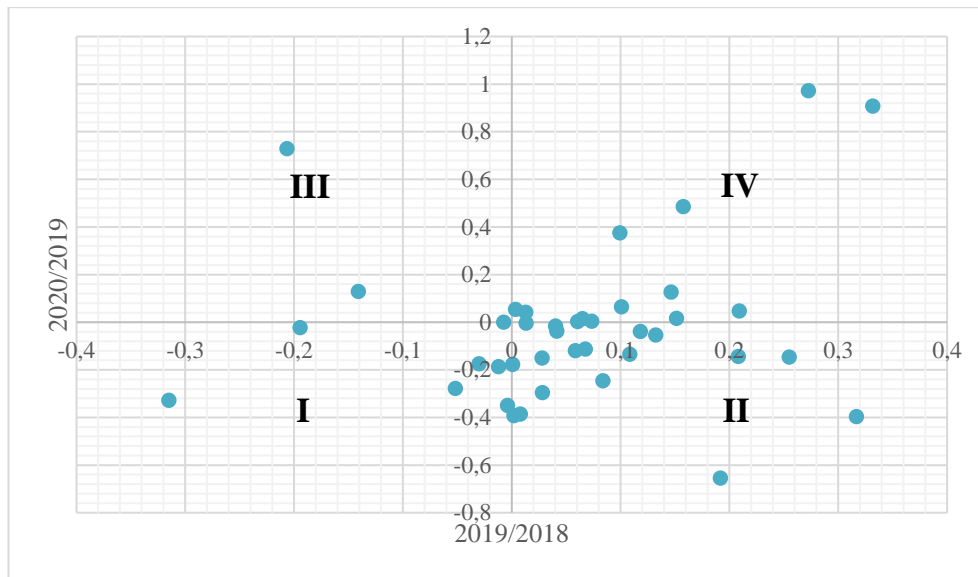


Figure 2: Changes in revenues in the second quarter of the year in 2018-2020
(Own calculations based on Notoria Serwis, 2021).

The division of the space presented in Fig. 2 into 4 quarters allowed to clearly define the change or remaining trend of a given industry. Having found the specific industry in the particular quarter:

- I. means that in the second quarter in both periods the industry recorded a decrease in revenues compared to the previous period
- II. means that in the second quarter before the pandemic, the industry recorded an increase, while in the same period in the pandemic, the industry recorded a decrease in revenues
- III. means that in the second quarter before the pandemic, the industry recorded a decrease, while in the same period in the pandemic, the industry recorded an increase in revenues
- IV. means that the industry saw growth in both periods.
- V. Belonging to individual groups is summarized in Table 4.

Table 4. Belonging to individual groups.

| | | 2019/18 | | |
|---------|----------------|----------|-----------|----------------|
| | | 0 | 1 | Overall |
| 2020/19 | 0 | 6 | 18 | 24 |
| | 1 | 3 | 13 | 16 |
| | Overall | 9 | 31 | 40 |

Source: Own calculations based on (Notoria Serwis, 2021)

Note that:

- (i) 6 industries recorded a decline in both periods;
- (ii) 18 industries recorded an increase in 2019/18 and a decrease in 2020/19;
- (iii) 3 industries recorded a decrease in 2019/18, while an increase in 2020/19;
- (iv) 13 industries recorded growth in both periods.

Based on the value of the annual change in revenues in individual industries in relation to the second quarter of 2019/2018 and 2020/2019, the allocation of industries to a particular quarter in a given period was determined. The summary is presented in Tab. 5.

Table 5. The allocation of industries to a particular quarter in a given period.

| Quartile | 2019/2018 | 2020/2019 |
|----------|-----------------------------|-----------------------------|
| 0-25 | transport and logistics | recreation and relaxation |
| | leasing and factoring | Financial intermediation |
| | recycling | receivables |
| | home furnishings | fuel and gas |
| | metallurgy | transport and logistics |
| | wood and paper | leasing and factoring |
| | new technologies | media |
| | construction | recycling |
| | real estate | electromechanical industry |
| | capital market | home furnishings |
| 25-50 | receivables | metallurgy |
| | fuel and gas | wood and paper |
| | media | chemistry |
| | chemistry | trade and services - other |
| | mining | hospitals and clinics |
| | heat and water distribution | clothing and cosmetics |
| | business services | mining |
| | drug production | automotive |
| | supply | finance - other |
| | rubber and plastics | drug distribution |
| 50-75 | electromechanical industry | heat and water distribution |
| | clothing and cosmetics | new technologies |
| | automotive | business services |
| | finance - other | drug production |
| | drug distribution | construction |
| | telecommunication | telecommunication |

| | | |
|--------|--------------------------------|--------------------------------|
| | groceries | groceries |
| | Insurance | Insurance |
| | Informatics | commercial networks |
| | internet commerce | supply |
| 75-100 | recreation and relaxation | energy |
| | Financial intermediation | rubber and plastics |
| | trade and services - other | Informatics |
| | hospitals and clinics | investment activity |
| | commercial networks | real estate |
| | energy | internet commerce |
| | investment activity | biotechnology |
| | biotechnology | capital market |
| | medical equipment and supplies | medical equipment and supplies |
| | games | games |

Source: Own calculations based on (Notoria Serwis, 2021)

Then, the adherence of given industries to individual quartiles was compiled. The results are presented in Tab. 6.

Table 6. Adherence of industries to quartiles.

| | | 2019/2018 | | | | Overall |
|---|--------|-----------|-------|-------|--------|---------|
| | | 0-25 | 25-50 | 50-75 | 75-100 | |
| 2020/2019 | 0-25 | 4 | 3 | 1 | 2 | 10 |
| | 25-50 | 2 | 2 | 4 | 2 | 10 |
| | 50-75 | 2 | 4 | 3 | 1 | 10 |
| | 75-100 | 2 | 1 | 2 | 5 | 10 |
| Overall | | 10 | 10 | 10 | 10 | 40 |
| Chi-square = 8.800 (p-value=0.456), Monte Carlo (N=10000) p-value = 0.516 | | | | | | |

Source: Own calculations based on (Notoria Serwis, 2021)

The comparison of the two periods suggests that in both periods and in all groups, there was at least one industry with a notable change in the particular quartile. Therefore, it can be assumed that there is no dependency between belonging to a particular quartile. In order to confirm this hypothesis, the Chi-square test of independence was used.

With a probability of as high as 99%, it should be stated that there are no grounds for rejecting the null hypothesis that the phenomenon is independent. Therefore, there is no dependence on how the company's revenues behaved before the pandemic in relation to how they behaved after the outbreak of the pandemic.

Discussion

The scope of the coronavirus pandemic covered all segments of national economies, which had a substantial impact on the global economy. In order to mitigate the effects of the spreading coronavirus pandemic, national governments not only introduced local sanitary restrictions but were also forced to introduce an almost complete shutdown of the economies, i.e. lockdown. All aspects of social and economic life have been significantly changed with the spreading COVID-19 disease, constantly returning in new waves. However, despite the different degrees and dimensions of changes in individual economic aspects, one common trend is noticeable, namely the transition to the digital economy (Dementiev, 2021; Kravchenko, et al., 2021). Because of the widespread and severe lockdown, consumers were compelled to switch their activities to the Internet sphere, as many industries were forced to close their brick-and-mortar stores (Ungerer et al., 2020; Sumarliah et al., 2021).

There are several sectors of the economy that have recorded better financial results after the outbreak of the COVID-19 pandemic. Due to the closure of the economy and epidemiological restrictions, people were forced to stay at home, and therefore, in order to provide home entertainment, the demand for video games increased, ensuring strong growth in this industry. The global, multi-faceted crisis, social panic caused by the uncertainty of the future and disease complications resulted in natural economic growth in the medical industry, in particular in the sale of drugs and medicines. In macroeconomic terms, a dynamic and uncertain pandemic scenario led to a combined supply and demand disturbance, resulting in monetary repercussions (like intensified inflation) and magnifying wealth disparity if not dealt with effectively (Cavallo, 2020, Barczyk & Urbanowicz, 2021). Due to the inflationary context, an increase in the number and value of real estate investments has been remarked, and hence the growth of this segment is observed.

However, many more areas of the economy suffered from financial strain after the outbreak of the coronavirus pandemic. For example, lockdown and restrictions on travel (not only cross-border but also within the country) contributed to a significant deterioration of the condition of the tourist and recreational sector. Similarly, there is an observable decline in the financial results of the commerce industry (despite the substantial presence of electronic commerce). In this aspect, the state aid policy for entrepreneurs plays an important role, particularly in support programs such as subsidies, low-interest loans or tax exemptions in the context of counteracting the effects of the COVID-19 pandemic (Barczyk & Urbanowicz, 2021). Furthermore, Kubiczek and Derej (2021) observe the excessive convolutedness of the government's "anti-crisis shield", which effectively hinders quick access to aid funds. Over time, however, enterprises begin to function more effectively and fight the socio-economic COVID-19 quandary because the longer it lasts, the more information and experience appear over time. Thus, it translates into better entrepreneurial performance during crises (Chernogorova et al., 2021). It is noted that the more data a company owns and processes, the better it adapts to consumers' expectations through in-depth insight into them.

Conclusions

Overall, crises, by definition, have a negative effect on the economy. On the one hand, crisis-surviving firms are better prepared for the next one, and their experience and acquired skills allow them to deal more efficiently with similar situations. Therefore, it is also crucial how quickly the organization can learn and how this knowledge will be used. On the other hand, the results of the analysis of the impact of the crisis caused by the pandemic on individual industries allow the state to better prepare various protective measures to prevent its effects.

However, experience from the Covid-19 pandemic shows that the crisis is impacting industries differently. There are industries that very effectively adapt to the external situation and generate sales increases. Most industries have suffered from the recent crisis, either because of their core business (e.g. recreation and leisure, transport and logistics, fuel and gas) or because of a lack of ideas to adapt to the challenging new conditions. The results show that business segments reacted differently to the COVID-19 pandemic, especially in the second quarter of 2020. Moreover, the financial results in individual segments fell to extremes, as evidenced by a significant increase in the value of the standard deviation in 2020 compared to 2019. This is the effect of that at that moment, the pandemic started, and most countries in the world introduced a national economic lockdown (also in Poland). Thus, functioning in the new reality favored the segments based on digitized form (games, e-commerce) and health (drugs and medical equipment), which recorded significant profits and 23 out of 40 recorded losses compared to the previous year. This can be largely justified by the hierarchy of needs. The industries that saw the smallest revenues changes meet basic needs, such as groceries, heat and water distribution and telecommunications. In contrast, industries that respond to less important needs, such as home furnishings, clothing and cosmetics, or recreation and leisure, saw significant declines in response to the crisis.

The presented observations may have significant practical implications. In the case of entrepreneurs, the knowledge of the sensitivity of the industry in which they operate to the crisis may allow to some extent to prepare for a possible reduction in demand and, as a result, avoid losses, e.g. by reducing costs suspending or postponing investments. The results of the conducted analyzes may also be of paramount importance for government institutions in the context of the preparation of appropriate anti-crisis shields and proper allocation of aid funds in order to protect entrepreneurs against bankruptcy and protect jobs.

As the direction of further work on the analysis of the industry sensitivity to the crisis mentioned above, one can indicate the update of the research, extended by the update of reports analyzed within the companies' industries, in terms of supplementing their reports on the results for the next quarters of 2021.

References

- Ahmed, R. R., Streimikiene, D., Rolle, J-A. and Duc, P. A., (2020). The COVID-19 Pandemic and the Antecedents for the Impulse Buying Behavior of US Citizens. *Journal of Competitiveness*, 12(3), 5–27.
- Al-Hawari, A. R. R. S., Balasa, A. P. and Slimi, Z., (2021). COVID-19 Impact on Online Purchasing Behaviour in Oman and the Future of Online Groceries. *European Journal of Business and Management Research*, 6(4), 74–83.
- Alon, I., (2020). COVID-19 and International Business: A Viewpoint. *FIIB Business Review*, 9(2), 75–77.
- Barczyk, R., Urbanowicz, Z., (2021). Działania stabilizacyjne w gospodarce polskiej w okresie pandemii COVID-19. Research Papers of the Wrocław University of Economics/Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, 65(3), 1-12.
- Bernardelli, M., Korzeb, Z. and Niedziółka, P., (2021). The banking sector as the absorber of the COVID-19 crisis? Economic consequences: perception of WSE investors. *Oeconomia Copernicana*, 12(2), 335–374.
- Brynjolfsson, E., Horton, J. J., Ozimek, A., Rock, D., Sharma, G. and TuYe, H.-Y., (2020). *COVID-19 and Remote Work: An Early Look at US Data*.
- Butler, J., Sullivan, J., (2005). Crisis response tactics: U.S. SMEs' responses to the Asian financial crisis. *Journal of Business and Entrepreneurship*, 17(2), 56–69.
- Camillus, J. C., Datta, D. K., (1991). Managing strategic issues in a turbulent environment. *Long Range Planning*, 24(2), 67–74.
- Cavallo, A., (2020). Inflation with Covid consumption baskets (No. w27352). *National Bureau of Economic Research*.
- Chernogorova, Y., Bliznakov, Z. and Bliznakova, K., (2021). Management challenges in implementing scientific projects during COVID-19 pandemic. *Polish Journal of Management Studies*, 23(1), 136–150.
- Christensen, T., Laegreid, P. and Rykkja, L. H., (2016). Organizing for Crisis Management: Building Governance Capacity and Legitimacy. *Public Administration Review*, 76(6), 887–897.
- Crick, J. M., Crick, D., (2020). Coopetition and COVID-19: Collaborative business-to-business marketing strategies in a pandemic crisis. *Industrial Marketing Management*, 88, 206–213.
- Cutlip, S. M., Center, A. H. & Broom, G. M., (2006). *Effective public relations (9th ed.)*. Pearson Prentice Hall.
- Dannenberg, P., Fuchs, M., Riedler, T. and Wiedemann, C., (2020). Digital Transition by COVID-19 Pandemic? The German Food Online Retail. *Tijdschrift Voor Economische En Sociale Geografie*, 111(3), 543–560.
- Dementiev, V., (2021). Why Countries Differ Greatly in the Effects of COVID-19. *Montenegrin Journal of Economics* 17(4), 55–63.
- Dyduch, W., Chudziński, P., Cyfert, S. and Zastempowski, M., (2021). Dynamic capabilities, value creation and value capture: Evidence from SMEs under Covid-19 lockdown in Poland. *Plos One*, 16(6), e0252423.
- Evenett, S. J., (2020). Sicken thy neighbour: The initial trade policy response to COVID-19. *The World Economy*, 43(4), 828–839.

- Fabeil, N. F., Pazim, K. H. and Langgat, J., (2020). The Impact of Covid-19 Pandemic Crisis on Micro-Enterprises: Entrepreneurs' Perspective on Business Continuity and Recovery Strategy. *Journal of Economics and Business*, 3(2).
- Fonseca, L. M., Azevedo, A. L., (2020). COVID- 19: outcomes for Global Supply Chains. *Management & Marketing. Challenges for the Knowledge Society*, 15(s1), 424–438.
- Grofcikova, J., (2020). Impact of selected determinants of corporate governance on financial performance of companies, *Ekonomicko-manazerske spektrum*, 14(2), 12-23.
- Hahm, S. D., Jung, K. and Moon, M. J., (2013). Shaping Public Corporation Leadership in a Turbulent Environment. *Public Administration Review*, 73(1), 178–187.
- Hamidi, S., Zandiatashbar, A., (2021). Compact development and adherence to stay-at-home order during the COVID-19 pandemic: A longitudinal investigation in the United States. *Landscape and Urban Planning*, 205, 103952.
- Hartono, A., Ishak, A., Abdurrahman, A., Astuti, B., Marsasi, E. G., Ridanasti, E., Roostika, R. and Muhammad, S., (2021). COVID-19 Pandemic and Adaptive Shopping Patterns: An Insight from Indonesian Consumers. *Global Business Review*, 097215092110135.
- Jaipuria, S., Parida, R. and Ray, P. (2021). The impact of COVID-19 on tourism sector in India. *Tourism Recreation Research*, 46(2), 245–260.
- Köksal, M. H., Özgül, E., (2007). The relationship between marketing strategies and performance in an economic crisis. *Marketing Intelligence & Planning*, 25(4), 326–342.
- Kravchenko, S.A., Sidorov, N. and Draskovic, V., (2021), “New Challenges to Economy Security: the Convergence of Energy and Covid-19 Risks – The Demand for Cosmopolitan Politics”, *Montenegrin Journal of Economics*, 17(2), 187-194.
- Krüger, N., Meyer, N., (2021). Covid-19 pandemic business relief: a comparative study of South Africa and selected European countries. *Polish Journal of Management Studies*, 23(2), 249–266.
- Kubiczek, J., (2021). Prospects for the development of corporate social responsibility in Poland after the COVID-19 pandemic. *Journal of Contemporary Issues in Business and Government*, 27(5), 1211–1217.
- Kubiczek, J., Derej, W., (2021). Tarcze antykryzysowe jako źródło wsparcia działalności MŚP w dobie pandemii COVID-19. *Przegląd Prawno-Ekonomiczny (in press)*.
- Kuc-Czarnecka, M., (2020). COVID-19 and digital deprivation in Poland. *Oeconomia Copernicana*, 11(3), 415–431.
- Latham, S., (2009). Contrasting Strategic Response to Economic Recession in Start-Up versus Established Software Firms. *Journal of Small Business Management*, 47(2), 180–201.
- Lin, B., Zhang, Y. Y., (2020). Impact of the COVID-19 pandemic on agricultural exports. *Journal of Integrative Agriculture*, 19(12), 2937–2945.
- Liu, N., Xu, Z. and Skare, M., (2021). The research on COVID-19 and economy from 2019 to 2020: analysis from the perspective of bibliometrics. *Oeconomia Copernicana*, 12(2), 217–268.
- Loske, D., (2020). The impact of COVID-19 on transport volume and freight capacity dynamics: An empirical analysis in German food retail logistics. *Transportation Research Interdisciplinary Perspectives*, 6, 100165.
- Maciejewski, G., Malinowska, M., Kucharska, B., Kucia, M. and Kolny, B., (2021). Sustainable Development as a Factor Differentiating Consumer Behavior: The Case of Poland. *European Research Studies Journal*, XXIV(3), 934–948.

- Mach-Król, M., Hadasik, B., (2021). On a Certain Research Gap in Big Data Mining for Customer Insights. *Applied Sciences*, 11(15), 6993.
- Madeira, A., Palrão, T. and Mendes, A. S., (2021). The Impact of Pandemic Crisis on the Restaurant Business. *Sustainability* 13(1), 40.
- Naidoo, V., (2010). Firm survival through a crisis: The influence of market orientation, marketing innovation and business strategy. *Industrial Marketing Management*, 39(8), 1311–1320.
- Penrose, J. M., (2000). The role of perception in crisis planning. *Public Relations Review*, 26(2), 155–171.
- Polski Instytut Ekonomiczny (2021). *Tarcza Antykryzysowa. Koło ratunkowe dla firm i gospodarki?*. 4-6, 57.
- Ritter, T., Pedersen, C. L., (2020). Analyzing the impact of the coronavirus crisis on business models. *Industrial Marketing Management*, 88, 214–224.
- Seetharaman, P., (2020). Business models shifts: Impact of Covid-19. *International Journal of Information Management*, 54, 102173.
- Sharma, P., Leung, T. Y., Kingshott, R. P. J., Davcik, N. S. and Cardinali, S., (2020). Managing uncertainty during a global pandemic: An international business perspective. *Journal of Business Research*, 116, 188–192.
- Shrestha, N., Shad, M. Y., Ulvi, O., Khan, M. H., Karamehic-Muratovic, A., Nguyen, U.-S. D. T., Baghbanzadeh, M., Wardrup, R., Aghamohammadi, N., Cervantes, D., Nahiduzzaman, Kh. M., Zaki, R. A. and Haque, U., (2020). The impact of COVID-19 on globalization. *One Health*, 11, 100180.
- Sigala, M., (2020). Tourism and COVID-19: Impacts and implications for advancing and resetting industry and research. *Journal of Business Research*, 117, 312–321.
- Sumarliah, E., Usmanova, K., Mousa, K. and Indriya, I., (2021). E-commerce in the fashion business: the roles of the COVID-19 situational factors, hedonic and utilitarian motives on consumers' intention to purchase online. *International Journal of Fashion Design Technology and Education*, 1–11.
- Škare, M., Soriano, D. R. and Porada-Rochoń, M., (2021). Impact of COVID-19 on the travel and tourism industry. *Technological Forecasting and Social Change*, 163, 120469.
- van Assche, A., Lundan, S., (2020). From the editor: COVID-19 and international business policy. *Journal of International Business Policy*, 3(3), 273–279.
- Vardarli, P., (2016). Strategic Approach to Human Resources Management During Crisis. *Procedia - Social and Behavioral Sciences*, 235, 463–472.
- Ungerer, C., Portugal, A., Molinuevo, M. and Rovo, N., (2020). *Recommendations to leverage E-commerce during the COVID-19 crisis*. World Bank, Washington, DC. <http://hdl.handle.net/10986/33750>
- Wolbers, J., Boersma, K. and Groenewegen, P., (2018). Introducing a Fragmentation Perspective on Coordination in Crisis Management. *Organization Studies*, 39(11), 1521–1546.
- Zrałek, J., Burgiel, A., (2020). Prospects for a Sustainable Future: Mapping Sustainable Behaviors According to Consumer Perceptions. *Review of Business*, 40(1), 35–50.

WYNIKI FINANSOWE PRZEDSIĘBIORSTW W WARUNKACH PANDEMII COVID-19 – BADANIE PORÓWNAWCZE

Streszczenie: Wybuch pandemii koronawirusa wprowadził wyjątkową niepewność w prowadzeniu biznesu, który nie został zamknięty w pierwszych kwartałach jej trwania. Branże, które skoncentrowały się na cyfryzacji biznesu, w naturalny sposób odniosły korzyści, ponieważ ograniczenia, które zostały wprowadzone w celu ograniczenia rozprzestrzeniania się pandemii, pociągały za sobą popyt na zakup produktów i usług za pośrednictwem Internetu. Celem badania było przedstawienie wpływu pandemii na biznes w Polsce. Skupiono się nie tylko na gospodarce jako całości, ale przede wszystkim na jej poszczególnych segmentach. Przedmiotem badania były spółki notowane na Giełdzie Papierów Wartościowych w Warszawie, a przedmiotem ich był wpływ pandemii na ich wyniki finansowe. Źródłem danych do analiz była baza danych Notoria Serwis S.A. Okres badania obejmował lata 2017-2021 z podziałem na kwartały. Wyniki badania wykazały, że istnieje znaczne zróżnicowanie wrażliwości poszczególnych branż na kryzys wywołany pandemią COVID-19. Większość branż odnotowała spadek przychodów, ale były też branże, które nie wykazały negatywnych zmian w tym zakresie oraz takie, których przychody wzrosły. Praktyczne implikacje opracowania obejmują perspektywę zastosowania wyników analiz do przyszłych działań ochronnych państwa w branżach najbardziej narażonych na negatywne skutki kryzysu.

Słowa kluczowe: biznes, przedsiębiorczość, COVID-19, zarządzanie kryzysowe, kryzys pandemiczny.

COVID-19 疫情下企业的财务表现——比较研究

摘要: 冠状病毒大流行的爆发给企业经营带来了异常的不确定性，该企业在其持续时间的第一季度尚未关闭。专注于数字化业务的行业自然会受益，因为为限制大流行的传播而引入的限制意味着使用互联网购买产品和服务的需求。该研究的目的是展示大流行对波兰商业的影响。重点不仅是整个经济，而且尤其是它的特定细分市场。该研究的主题是在华沙证券交易所上市的公司，其主题是大流行对其财务业绩的影响。用于分析的数据来源是 Notoria Serwis S.A. 的数据库。研究期间涵盖 2017-2021 年，分为几个季度。研究结果表明，特定行业对 COVID-19 大流行造成的危机的敏感性存在显著差异。大多数行业的收入都出现了下降，但也有一些分支机构在这方面没有出现负面变化，而那些收入却有所增加。该研究的实际意义包括将分析结果应用于未来针对最容易受到危机负面影响的行业的国家保护措施的前景

关键词: 商业、创业、COVID-19、危机管理、大流行危机。