

The Impact of E-Business on Entrepreneurship Development in the Context of COVID-19

LIUDMYLA VERBIVSKA

Department of Business, Trade and Stock Exchange Operations,
Yuriy Fedkovych Chernivtsi National University,
2 Kotsyubynsky str., 58012, Chernivtsi,
UKRAINE

HASSAN ALI AL- ABABNEH

Faculty of Administrative and Financial Sciences - E - Marketing and Social Communication,
Irbid National University,
PO Box 2600, 21110 Irbid,
JORDAN

ALINA KORBUTIAK

Department of Public, Corporate Finance and Finance Intermediation,
Yuriy Fedkovych Chernivtsi National University,
2 Kotsyubynsky str., 58012, Chernivtsi,
UKRAINE

OLENA BONDAR

Department of Information Systems and Technologies,
Bila Tserkva National Agrarian University,
8/1 Soborna Sq., 09117, Bila Tserkva,
UKRAINE

ANNA PANCHENKO

Department of Business Economics and Investment,
Lviv Polytechnic National University,
12 Bandera str., 79013, Lviv,
UKRAINE

INNA IPPOLITOVA

Department of Entrepreneurship and Trade,
Simon Kuznets Kharkiv National University of Economics,
9-A Nauki Ave., 61166, Kharkiv,
UKRAINE

Abstract: - The COVID-19 pandemic impacted every aspect of life on a global scale. E-business has become a key factor influencing the profitability of businesses in various fields, regardless of their size. The aim of this study was to assess the effectiveness of e-business in entrepreneurship development in various fields during the COVID-19 pandemic. For this purpose, a panel analysis of data from 212 micro, small, medium-sized and large companies, and nine business sectors (trade, chemical, light, pharmaceutical, food, agricultural, HoReCo (hotel and restaurant industry), electronics and IT, transport) was used with data comparison for 2019 and 2020 in Ukraine, Bulgaria, Poland, Moldova and Georgia. The e-business platform was found to be the key indicator of maintaining performance during a pandemic. The analyzed questionnaire data show that 58% of respondents saw an increase in online income in 2020 compared to 2019 that in such sectors as trade, IT and pharmacy. There were 59% of respondents who saw the need to expand communication networks with existing and potential customers, because it was positively correlated with the efficiency of e-business. Besides, the results show that equity financing and proper liquidity management consolidate the economic performance of

businesses in terms of return on equity and return on assets. Our findings are useful to managers and investors, and can help them make the best decisions about their management or investment activities. Moreover, the study demonstrates how companies were responding to the pandemic in order to identify sectors that are more vulnerable to the effects of the crisis and the key financial management decisions that companies need to make during the crisis.

Key-Words: - E-business; Business; Return on assets; Return on investment; COVID-19.

Received: June 6, 2022. Revised: September 18, 2022. Accepted: October 22, 2022. Published: November 14, 2022.

1 Introduction

The COVID-19 pandemic has become a catalyst for global economic change and radically reshaped global business trends. The changes caused by forced restructuring in the behavior of ordinary consumers, the nature of trade, and even lifestyles have affected every business. E-business has become not only one of the main sectors of the economy, but also an integral part of people's economic and social activities. In a broad sense, e-business is any economic activity that involves the use of electronic digital technologies. According to [1], the e-business market grew by 25% in the United States and by almost 30% in Europe in 2021 compared to 2020. Author, [2], states that analysts single out the UK and the US with a share of e-business of 10% or more in total retail sales among the leading countries in terms of e-business market development. The COVID-19 pandemic, being significantly different from other types of pandemics, has had a significant impact on the world of e-business, although it is difficult to find any unaffected aspect of our lives. For example, [3] states that COVID-19 has spread to 112 countries and, as of April 2022, is the most widespread virus in the world. COVID-19 can also be diversified by industry, as it has affected the manufacturing and service sectors, including the HoReCo industry. Author, [4], notes that 52% of consumers avoided shopping and crowding during the pandemic. Researchers, [5], provide the following data: 50% of respondents said that they are less likely to visit shopping malls and take part in entertainment, followed by 46%, who said that they eat in public catering establishments less often. Besides, [6] notes that the COVID-19 outbreak changed the supply channels for consumers, and therefore accelerated the structural changes in the industry that affected all. Author, [7], adds that it has also affected the channels of interaction between manufacturers (business relationships) and the way companies work with their direct suppliers, wholesalers and distributors.

Finally, the COVID-19 has impacted the end consumer, and many suppliers cannot sell expensive goods, while other outbreaks of the pandemic have not had much impact on purchasing power. Researcher [8] indicates that companies have many questions in the chaotic situation of a pandemic outbreak, such as how they can withstand downtime and how long it will take them to recover from a pandemic.

The role of e-business has grown significantly because of the pandemic, and consequently the people' inability to go into the street. According to the World Trade Organization, more than 3.2 billion people were quarantined and worked at home in 2020, which resulted in a significant increase in online shopping transactions during this period. Authors, [9], note that COVID-19 has become a source of global economic catastrophe and uncertainty, as it has changed the value chain and consumer models, as well as issued the challenges of rapid cross-functional business evaluation [6]. Therefore, the study of the impact of the pandemic and e-business trends is extremely urgent.

Author, [7], indicates that the world has experienced the rapid development of information technology, which entailed positive growth in e-business in recent years, and COVID-19 has further promoted the development of e-business, so it is expected to reach \$ 6.5 trillion by 2023. Besides, the pandemic has increased demand for some products by 30-40%, [10], and formed the customers' habit to shop online, [11], indicating significant potential for development. Figure 1 illustrates the ten most popular e-commerce retailers in the 2020 pandemic.

On the other hand, the COVID-19 pandemic has caused significant difficulties for the business environment around the world, as the growth or decline in demand for a particular digital service largely depends on customer behavior in terms of perception of this global problem. Measures that blocked and reduced business mobility have created many barriers in the supply chain, [12], and have threatened business continuity in a wide range of activities [13].

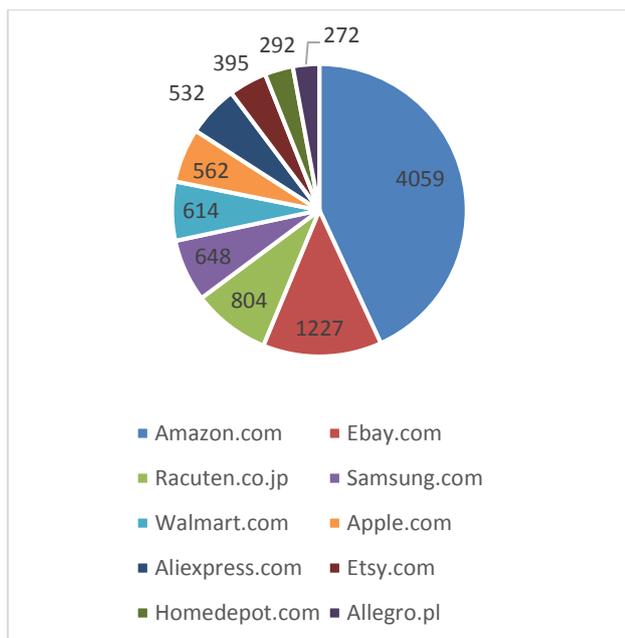


Fig. 1: The most popular e-business retail websites in a pandemic [5]

The aim of the study was to assess the effectiveness of e-business on business development during the COVID-19 pandemic. This aim was achieved through the fulfilment of the following interrelated objectives:

- Conduct a survey of business entities of different sizes and areas of activity to form a research sample;
- Analyze the collected statistics for 2019-2020 to assess the impact of the COVID-19 pandemic on the business environment;
- Identify the impact of e-business on business development during COVID-19.

2 Literature Review

Author, [14], defines electronic business (e-business) as an economic field that encompasses all types of Internet transactions, including e-commerce. The company's e-business provides for its own website, virtual store, [8], company management system, e-advertising, marketing, [15], business-to-business (B2B) or business-to-consumer (B2C) models, [16].

This area currently includes a wide range of remote services, which is constantly expanding due to the increasingly progressive introduction of economic activity on the Internet. Researcher, [14] argues that while COVID-19 is a catalyst for companies to revise their strategic business development plans, short-term actions can be implemented to respond to or mitigate the effects of

the COVID-19 pandemic to ensure business continuity, [15].

Besides, author, [15] argues that companies should train their employees to make decisions remotely and independently. Author, [12], states that businesses should also use digital technology and production automation. This is likely to reduce the negative impact on business operations during the COVID-19 pandemic outbreak, and reduce the profitability decline, [17].

Researcher, [15], states that COVID-19 causes a "tsunami-like" action, which affected all sectors of the economy without exception. Author, [13], emphasized that there has never been a period in economic history where business has experienced such complex stress because of the restrictions imposed by the governments around the world on free movement of goods. Researcher, [18], analyzed key changes in the activities of economic entities to assess business efficiency in response to the COVID-19 pandemic:

- First, companies had to stop the supply of raw materials because of the lockdown, which created significant difficulties for suppliers and the entire logistics chain. Prices have risen due to supply shortages and unchanged high demand, [10].
- Second, COVID-19 halted production, and demand for several products decreased significantly. In particular, food sales fell by 80-100% because of quarantine, [19].
- Third, receiving cash from retail chains has slowed down sharply. This means that cash turnover in commodity circulation has been critically reduced, with the exception of critical suppliers. This shortage has caused chaos in the tourism and hospitality industry and negatively affected the production and delivery of products, [20].

Pandemics are included in the list of unexpected disruptions in the company's economic activity (force majeure). Besides, they pose a particular threat to business activity management, which is primarily manifested in three main components: there is a feeling of long-term and great shock at the beginning, [10]; which is followed by the supply disruptions and spread of business chaos, and finally, pandemics cause large-scale disruptions in the infrastructure, [20]. Author [11] adds the fourth component — declining general consumer demand and distortion of consumption patterns, that is the emergence of market anomalies caused by panic buying due to changes in commodity preferences [10].

COVID-19 has also significantly affected countries' GDP. For example, the UK's GDP decreased by 21.7% in Q4 2020 because of COVID-

19 [21], with Spain ranking second after a 22.1% decline in GDP in 2020 [11]. COVID-19 also negatively affects the activities of business entities by significantly reducing their profits. For example, the German Post announced the EBIT reduction by EUR 60-70 million, [22]; retail prices in China grew by an average of 21.9% in February 2020 [10]. Apple, [23], reported a 15% and 18% decrease in quarterly earnings for the Q3 and Q4 2020, respectively.

Author [12] estimates that the COVID-19 outbreak caused a downtime of almost 9% of the container fleet, while China's production indices had reached their lowest level since the Great Recession upon suspension of production processes induced by COVID-19 as of late 2020.

Research on the effects of the pandemic outbreaks on business operations is not new, [24]. However, literature review reveals that most studies have focused on the impact of COVID-19 in terms of logistics. In fact, these studies mainly deal with the impact of COVID-19 in terms of geography and scale, without due regard to the methods of stabilization of business activity by an entity. Therefore, the focus of our research is the analysis of the impact of e-business on entrepreneurship during the global COVID-19 pandemic.

Some researchers made attempts of economic analysis of the impact of the coronavirus pandemic on businesses. Researchers [5] analyze the current business situation and state that the crisis may arise earlier for enterprises than for the whole country or the world economy because of internal violations. New trends assimilated by the businesses in response to the pandemic included e-commerce and new development opportunities helping to avoid closure. Another interesting position of the researchers is that the effects of the crisis last long after it has actually ended, for all levels of management, from employees and their families to countries and the world, [25]. It is necessary to manage cash flows properly, especially during a crisis, such as the COVID-19 pandemic.

According to author [7], there are numerous business indicators that reveal inadequate working capital, such as late payments (inability to pay bills on time), late deliveries (because the organization cannot maintain adequate inventory, because it buys materials from suppliers only after receiving orders from buyers for particular products, and this delivery period involves delays), and short-term loan (the organization requires that its customers pay an advance in cash to finance the manufacture of products).

Another group of studies [20], [21], [24] focuses on the management of large and small companies during a crisis. Researcher [21] found that small and medium-sized companies suffer more from the crisis than large companies because of the likely responsibility for shortage and lack of resources. An extensive study conducted by author [20] in August 2020 involving 2,200 small and medium-sized companies from five European countries (France, Germany, Italy, Spain and the United Kingdom) revealed that the vast majority of analyzed businesses reported a decline in their income. The decline was around 30-33% in Italy, Spain and the United Kingdom, while it is much lower in France and Germany (27% and 23%, respectively).

3 Methodology

The aim of the research was achieved through the research methodology which was based on the use of a multiple case study, where each company is considered as a separate case. In general, the research procedure consisted of the following stages:

1. Empirical information was collected through a questionnaire consisting of 17 questions related to basic information about companies and their characteristics (for example, size and industry), impact of COVID-19 outbreak on business, declining sales and profits, survival period (crisis period), normalization period and probable government support. The questionnaire is attached in Appendix A.
2. It was decided to involve a personal and professional network of researchers in order to increase the number of responses. We contacted potential respondents through various social networking platforms such as WhatsApp, Facebook and LinkedIn, including e-mail, and invited them to participate in an online survey. Complete confidentiality was guaranteed to all respondents so that a large number of companies could take part in the survey. Participation in the survey was voluntary, and no financial compensation was provided for the survey. The official launch of the survey was preceded by pre-testing the elements of the questionnaire among a small sample of business owners to assess the clarity and relevance of the questionnaire items to identify and address any potential problems.
3. As a result, data were collected from micro, small and medium-sized and large companies operating in nine industries: trade, chemical, light, pharmaceutical, food, agricultural,

HoReCo (hotel and restaurant), electronics and IT, transport (data were grouped according to the availability of the company's e-business platform, this is why small and large businesses could get into the same group, despite the large scale of variation in their variables). A total of 212 companies were surveyed. Geography — Ukraine, Bulgaria, Poland, Moldova, Georgia. Note that many researchers have also taken a similar approach and found it useful, as well as time- and cost-saving, [26], [27].

4. All variables were analyzed for two periods: 2019 (pre-pandemic period) and 2020 (active phase of the COVID-19 pandemic). All dependent variables studied are generally accepted indicators of management accounting on company performance: Return on Capital and Return on Investment of companies, which are further explained by several independent variables: working capital ratios, cash turnover ratio; capital structure ratios, financial autonomy ratio; and size indicators, such as the company's total assets, etc. (Table 1).

Table 1. Methodological imperative of the study

Group of variables	Indicator	Description	Formula
Performance indicators	Return on Equity (ROE)	Reflects efficiency of utilizing equity financing	Net Income / Shareholders' Equity
	Return on Assets (ROA)	is a profitability ratio that measures how well a company is generating profits from its total assets	Net Income/Total Assets
Size	Total Assets	Represents the total amount of assets owned by an entity	Total Assets (EUR)
Working capital	Net Working Capital	represents current assets that the company retains, namely current assets that remain after payment of current liabilities. For reasons of comparability, this indicator is often used as a weight indicator in total assets. It is also an indicator of liquidity	Net Working Capital / Total Assets (%)
	Cash Turnover Ratio	This is a measure of liquidity, which shows a company's ability to cover its short-term liabilities using cash and cash equivalents only	(Cash + Marketable Securities) / Current Liabilities (%)
	Receivables Turnover Ratio	It reflects the company's effectiveness in collecting its accounts receivable or money owed by customers	Sales / Average Receivables
Capital structure	Financial Autonomy Ratio	It shows the dependence that a company has on its creditors	Equity Capital/Total Liabilities (%)
	Debt ratio	Indicates the percentage of a company's assets that are provided via debt	Debt/Equity (%)

5. The data were interpreted through the descriptive analysis of changes. This method studies the impact of e-business in all its manifestations on the company's performance. In general, all selected research methods (multiple case studies, questionnaires, economic and statistical analysis, descriptive analysis of change, etc.) are integrated with the work of researcher, [28], who created online trading platforms and allowed customers and suppliers to trade online anytime, anywhere, even though they are in different time zones on different continents. The approaches that this researcher applied contributed to the Information Processing Theory and Digital Economy Theory, especially on the influence of e-business on consumer decision-making and the purchasing process itself. These approaches also provided support in determining the influence of e-accessibility on consumer decision-making and the purchasing process.

6. The next step was the advancement of the first hypothesis of the research:

- H1: The availability of an e-commerce platform has a correlation with the productivity of the whole business.

On the other hand, researchers [5] proposed a theory based on companies' beliefs about the impact of customer satisfaction with an online business platform on conversion rates and subsequent buying intentions. They also explained that each unit of website satisfaction indicator is projected to increase the company's average monthly revenue by \$14.26 million based on the average e-commerce retailer model.

7. This step involved the advancement of the following hypothesis (H2), which is considered through multi-attribute utility function:

- H2: Expansion of communication networks with existing and potential customers is positively correlated with the efficiency of e-business.

At the same time, different digital communication strategies for consumers in polychronic and monochronic countries should be taken into account in the context of e-business process management. According to author [17], polychronic culture (the multitasking culture of the French and Americans, among others) is a high-context culture that is more convenient for businesses to make decisions about buying and promoting goods to consumers through e-commerce.

Author, [28] identified seven factors of marketing communications' influence on driving online buyers: economic motivation (competitive pricing), social motivation (favorable social environment), product motivation (product availability), pragmatic motivation (convenience, family's/friend's influence), situational motivation (lack of time, lack of mobility, geographical distance, need for special items), service quality motivation (value-based perception) and demographic motivation (demographic parameters). So, the H2 hypothesis allows assessing the impact of positive decisions that the consumers make on e-commerce platforms on business performance.

In the context of the pandemic, we consider it important to analyze the degree of impact of COVID-19 on business performance indicators and try to interpret their meanings to understand the effects of the crisis on the selected companies. All variables are added by means of preliminary assessment with due regard to multicollinearity aspects.

4 Results

The first main results of our study are presented in Table 2, which reflects the changes in the performance of the surveyed companies in 2020 compared to 2019.

Table 2. Change in the performance of the surveyed companies, 2020 to 2019

Sector	Availability of e-commerce platform	2020 to 2019, (+/-) thousand USD							
		Non-current assets, total	Long-term financial investment	Total current assets	Total equity	Receipts	Cost of raw materials and consumables	Staff costs	Net profit
Agriculture	+	-3.23	23743	46082	-4.75	44604	43313	26.98	41.32
	-	44652	322.30	23043	34213	-279.57	14.63	22160	-228.70
Trade	+	24654	44698	-13.19	32874	33.38	28.81	12816	55.54
	-	-2.49	-0.11	24381	-0.75	-24.43	-56.68	12540	-9.29
Chemical industry	+	-24.39	-14.31	0.53	69.63	133.12	89.95	-28.77	29.48
	-	-1.15	21671	44741	17319	-11.93	44774	33208	-9.27
HoReCo (hotel and restaurant)	+	-5.15	-53.76	13.52	-0.79	-33.80	-20.93	-12.62	-335.39
	-	17930	0.38	-18.19	0.06	-61.88	-50.88	-32.78	-92.16
IT and electronics	+	28.86	0.81	0.44	47.76	129.47	27.44	-4.68	120.24
	-	-13.35	27120	-13.31	-10.34	-111.19	14.50	38.19	-162.30
Food industry	+	-7.64	32540	-0.73	22.78	-30.19	-20.17	-18.78	-14.08
	-	-1.07	44745	-40.84	-9.23	-8.01	-28.30	18598	38.06
Pharmacy	+	-3.02	0.00	46539	23802	21.49	22.31	44645	209.01
	-	23102	30590	22798	28126	-15.51	-22.28	36312	-38.69
Light industry	+	-10.09	46631	-8.80	-15.28	-25.60	-36.18	-28.42	-158.03
	-	-1.69		-4.10	13606	-32.24	-44.58	-7.23	149.83
Transport	+	18.73	394.39	76.08	44645	-6.85	3244.75	421.49	-6188.81
	-	27.60	114.47	-18.97	22341	-57.02	-12.40	18841	-26177

Significant changes in the main performance indicators that all types of businesses have undergone were noted in 2020 compared to the pre-COVID year of 2019. The interpretation of qualitative data related to the digital methods the company used to make its offers to customers found that many responses related to enhancing sales through digital means (for example, using a website to manage orders, takeaway sales, etc.). The analysis of the data from the questionnaires revealed that 58% of respondents had an increased income generated online in 2020 compared to 2019 in such areas as trade, IT and pharmacy. The primary reason for that is the large number of people who are stuck in their homes and accepted online shopping as a fact. This means that many companies quickly re-

oriented on people's needs and began to provide people with what they want and need. It was a rapid marketing re-orientation towards e-business that provided increased income. Pharmaceutical businesses achieved the largest positive change in profitability — 73% of companies in this sector reported growth. Consumer electronics also became very popular during the pandemic — 69% of companies have increased their revenue. There were 65% of companies selling cosmetics and personal care items which demonstrated growth, with 18% of them showing growth by more than 51%, which is higher than in any other category.

Figure 2 groups companies by the percentage of revenue from online sales in order to simplify the analysis:

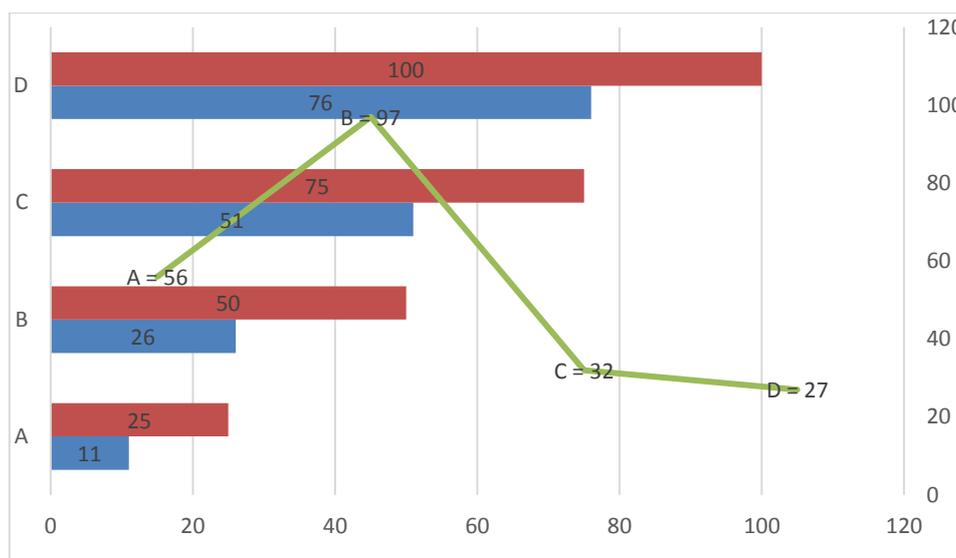


Fig. 2: Distribution of companies by groups of revenue growth in 2020 compared to 2019

According to our grouping, Group A included businesses that have increased their revenues by 11-25% over the said period (56 businesses); group B — 26-50% (97 businesses); group C — 51-75% (32 businesses); 76-100% (27 businesses). According to the survey, 58% of those surveyed said that their income generated online increased due to COVID-19. According to respondents, revenue growth during this period also depends on the company's online sales volumes. Revenue increased to 25% in 56% of Group A companies and 53% of Group B companies. Revenue increased by 50% in most Group C companies, while it increased by 51% or more in 47% of Group D companies.

Despite the growth in sales of certain products in many e-business companies, 48% of respondents reported consumers to reduce their costs due to job losses. Other barriers to income generation include delays in supply chains (48%) and lack of business - consumer communication (46%). A few e-business representatives surveyed indicated that they concerned themselves with the end consumers' opinions about the purchased product. To fill this gap, the vast majority (72%) stated their readiness to intensify their marketing policies in order to maintain dialogue with consumers. This was reported by 88% of pharmaceutical companies, producers and sellers of consumer electronics (86%), personal care items (82%) and producers of household commodities (80%). If we consider e-commerce sales compared to total sales, 82% of Group C companies promote their sales. They are followed by Group D (80%), Group B (72%) and Group A (50%) companies.

A total of 59% of respondents indicated that COVID-19 made them invest more in e-commerce

channels in the near future, because they believe in their rapid development. The distribution by business areas is as follows: consumer electronics (78%); ready-made food and beverages (77%); personal care items (75%). Despite the pandemic is abating, many people who would normally buy offline by 2020 have assimilated a habit of buying online. It is interesting that Group A companies are likely to invest more in e-commerce channels, as 65% of respondents reported. They were followed by Groups D (61%), Group C (58%) and Group B (57%) companies.

Therefore, the COVID-19 recession has affected all business areas, but not all companies use this time to move forward and retain their customers. The companies that maintain a constant dialogue with buyers will keep their business and will have a sustainable development as soon as the economy begins to recover. According to the respondents, 59% consider a company's presence on social networks as positive communication; 54% of respondents plan to invest in the brand reputation. A positive brand image and its protection is most important for companies engaged in the pharmaceutical business (80%), consumer electronics (78%), cosmetics (70%). A total of 62% Group C and Group D respondents said they would spend money on brand protection, followed by Group B (55%) and Group A (46%).

The analysis of the statistics collected separately over two years, which include the timing of our research panel allowed assessing the impact of the COVID-19 pandemic on the business environment and its evolution with a view to e-business. It was noted that the average Return on Investment in the selected companies decreased in 2020, while the

Return on Assets increased. This is explained by an increase in the actual volume of investments for the introduction of digital Internet platforms for business development (and not fixed assets, for example) and, as a result, an increase in the profit of operating activities. Smaller investments at the expense of equity (equity) capital used to finance the company's assets in 2020 (compared to 2019) made it possible to increase the indicators of

financial autonomy in 2020. Besides, the total assets of companies and the ratios of net working capital and cash flow increased on average in 2020 compared to the previous year. This is also due to online shopping. However, the average receivables turnover decreased in 2020 because of the pandemic (Table 3). Table 4 designs a correlation matrix between the studied variables.

Table 3. Analysis of statistical data on the results of economic entities in 2019 and 2020

Variable	Value	Std. Dev.	Min	Max
ROE_2019	0.2979	13.9491	-57.595	84.2946
ROE_2020	-1.5306	22.307	-261.369	74.2492
ROA_2019	-0.2322	7.0084	-30.9663	60.1173
ROA_2020	0.0217	2817817	-36.5278	168.7168
Debt Ratio_2019	53.0753	305.8779	-2680.71	3177.765
Debt Ratio_2020	50.8131	239.6238	-1342.27	1641.404
Financial Autonomy Ratio_2019	61.1329	44.703	-289.909	227.2304
Financial Autonomy Ratio_2020	63.9617	44.9695	-259.862	99.6157
Net Working Capital_2019	618661	43.8933	-218.322	233.5644
Net Working Capital_2020	755628	41.2283	-205.247	227.2274
Total Assets_2019	3.12×10^8	2.92×10^9	873.979	4.28×10^{10}
Total Assets_2020	3.27×10^8	3.09×10^9	1015.44	4.53×10^{10}
Accounts Receivable_2019	2438392	4.1371	-0.6091	49.4474
Accounts Receivable_2020	1940082	2112990	-0.6091	32.1221
Cash Turnover_2019	133.896	332.5721	-81.5196	2481.238
Cash Turnover_2020	144.5681	286.4192	-81.5196	2247.916

Table 4. Correlation matrix of the studied variables

	ROE	ROA	Total Assets	RTR	FAR	Net Working Capital	AR	Cash Turnover
ROE	1							
ROA	0.4946	1						
Total Assets	0.0241	0.0289	1					
Receivables Turnover Ratio (RTR)	-0.3971	-0.0136	0.0031	1				
Financial Autonomy Ratio (FAR)	0.0322	0.3277	0.0061	0.0313	1			
Net Working Capital	0.049	0.37	0.0085	0.1465	0.758	1		
Accounts Receivable (AR)	0.0585	0.0375	-0.012	-0.0415	-0.0219	-0.0384	1	
Cash Turnover	0.0574	0.0975	-0.0091	-0.0378	0.213	0.2188	0.0611	1

Studies confirm the direct and indirect relationships between ROE and ROA, on the one hand, and other independent variables, on the other hand, that are reflected in the positive or negative

correlation coefficients. So, Table 5 provides estimates of simple and multiple regression modelling applied to our unbalanced short data set. The obtained model estimates the impact of the

Debt Ratio on the Return on Capital of companies and shows a negative correlation in many business areas, as expected from the correlation matrix of these variables, taking into account previous calculations (Table 3). This debt indicator has the greatest explanatory power (its correlation coefficient is 0.0781). When the debt-to-equity ratio of companies increases by one, their rate of return

on equity decreases by an average of 0.2204, with everything else remaining unchanged. This explains the general economic situation when most companies tried to save their business during the COVID-19 pandemic by additional equity infusions. Calculations demonstrated that the more companies finance their activities throughout the crisis, the lower their return on equity.

Table 5. Companies' performance based on ROE and ROA modelling as dependent variables

Sector	ROE		ROA	
	Simple regression	Multiple regression	Simple regression	Multiple regression
Agriculture	3.1046	3.1844	0.8909	0.9519
Trade	1.626792	1.780559	0.2424	0.3298
Chemical Industry	0.8859	0.9388	3.747348	2.91483
HoReCo (hotel and restaurant)	-1.213	-1.2631	0.8453	0.9917
IT and Electronics	2.0719	2.0543	0.7827	0.7159
Food Industry	-3.61198	-2.74866	-3.34613	-2.552
Pharmacy	2.17534	1.038964	2.366102	4.0871
Light industry	-2.829	-2.401503	-2.053760	-2.142150
Transport	-11.2652	-11.2261	-7.0925	-6.1502
R ²	0.2204	0.1325	0.0981	0.3372
Adjusted R ²	0.1925	0.0781	0.2839	0.1523

Besides, the answers to the open-ended questions of the questionnaire were analyzed through specific methods of qualitative data analysis. There were 153 of 212 businesses (72.2%) that agreed that their companies used more digital methods in its offers to customers during the crisis

caused by COVID-19, and noted a positive growth of their business. Figure 3 illustrates this in the sectoral context.

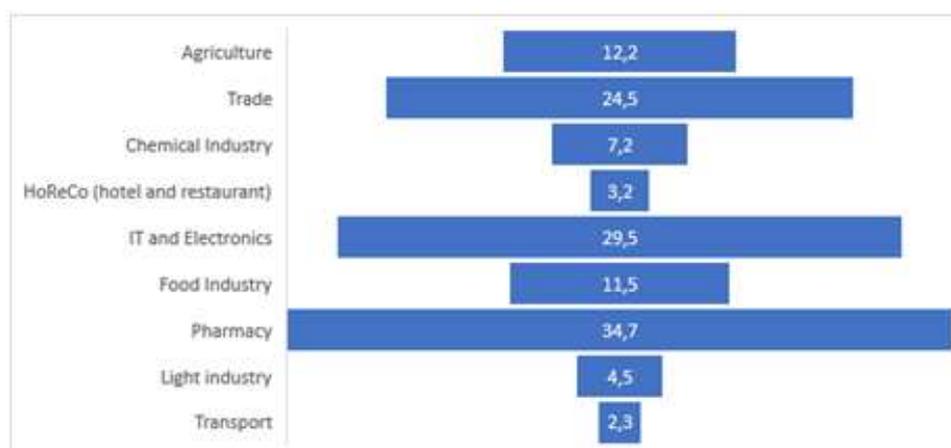


Fig. 3: Changes in the performance indicators of business entities since the introduction of e-business in the sectoral context

5 Discussion

This study was devoted to identifying the impact of the global coronavirus pandemic on the results of entrepreneurial activity in various business areas in different countries. Thus, it was found that the most common method of preventing the devastating effects of COVID-19 on business areas such as procurement, logistics, finance, etc., many companies have implemented online trading to reduce the likely impact in the long term. The findings suggest that adopting e-commerce practices helps companies better manage the impact of COVID-19 and prepare accordingly for the next unforeseen event. The similar importance of conducting global scenario planning for predicting the impact of COVID-19 is widely discussed in the scientific literature. For example, author, [14], argued that a decision support system should be developed to predict the long-term impact of COVID-19, while author, [15], presented a simulation model to predict the effects of COVID-19. Our results are consistent with these studies and argue that using Internet technologies to mitigate the impact of global pandemics can help companies better prepare for operational constraints.

Our study has managerial implications. It highlights actions taken by companies to mitigate the impact of COVID-19, such as proactively developing e-business. Using a multiple case approach, data from companies of different sizes operating in nine industries were analyzed: trade, chemical, light, pharmaceutical, food, agricultural industry, HoReCo (hotel and restaurant industry), electronics and IT, transport found that companies that use more digital methods in their business processes have better performance during the pandemic. These digital methods include both communication (for remote access to the internal workflow organization system or active communication with consumers of your product), and work platforms, social network platforms (for trading, etc.).

We also found that many companies implement flexible systems to solve online communication problems, and it is difficult for some companies to cope with the sudden transition to online activities with a less reliable system that ensures business continuity, [21]. This is why we propose the companies to take additional steps and actively develop a strong infrastructure to ensure the continuity of e-business.

Besides, in agreement with author, [11], the following hypotheses about differences in end-customer approaches before and after the COVID-19 outbreak were confirmed:

- before the pandemic, the experience of customers (evaluation of feedback) had a positive but not so significant impact on the (relative) performance of the e-commerce platform. However, the pandemic outbreak has changed customer behavior, and businesses should make an effort to buy what they need to buy under certain restrictions;

- before the pandemic, the relationship between business performance and e-commerce platform performance was not as pronounced as during its outbreak. The reason for this was the transformation of the method of obtaining the desired product by the final consumer due to territorial transport bans and the mass mobility restriction. As [6] states, this has forced companies to implement strategies to stimulate demand and flexible production to make it closer to the consumer.

The results of the study show that the majority of surveyed organizations (77.8%) use more digital methods of communication with their clients now than before the COVID-19 crisis (no country-related differences were observed). Contacts with customers through digital methods are directly related to changing consumer behavior due to the COVID-19 crisis.

One of the limitations of this study is the small pool of respondents in the sample, which, although reasonably reliable from a statistical point of view, may not cover the diversity of organizations necessary to fully represent the business environment in all countries. We remind you that the data were collected anonymously by surveying top business managers, which preserved the veracity of the data obtained. Also, because this study was cross-sectional, differences between sectors were not taken into account. The second limitation is that the data were collected in the pre-2019 period and the first phase of the COVID-19 outbreak (2020), which does not show the full picture of the impact of the Internet business development strategy on the profitability of enterprises. For future studies, it is suggested to increase the number of respondents in the sample, to study three phases of COVID-19 (2020, 2021 and early 2022), as author, [19], advises, and to process data using structural equation modeling, [5], to see how the difference between the results. This approach will confirm the opinion that digitalization in general helps organizations to create sustainable business models, and the choice and method of implementation of the applied digital methods depends solely on the level of digitalization in the country of business operation, [9]. We believe that future research is required to better understand the impact of the COVID-19 pandemic on business models and to use

digitalization to reduce its negative effects on business models.

6 Conclusions

The COVID-19 pandemic was a sudden but ambiguous factor of impact on businesses around the world. While some businesses will remain closed after COVID-19, others may experience huge growth. The aim of the study was to analyze key changes in the activities of business entities to assess the efficiency of e-business and its impact on the entrepreneurship development in various fields during the COVID-19 pandemic.

The multiple case study was used to collect data from micro, small and medium-sized and large companies operating in nine industries: trade, chemical, light, pharmaceutical, food, agricultural, HoReCo (hotel and restaurant industry), electronics and IT, transport. The data were grouped by availability of e-business platform, regardless of company size. The descriptive analysis of changes was used to interpret the data.

The hypotheses advanced in the study were confirmed step by step: Hypothesis (H1) suggested a correlation between the availability of an e-commerce platform and increasing the productivity of the whole business. The analyzed data from the questionnaires show that 58% of respondents in such industries as trade, IT and pharmacy saw an increased income generated online in 2020 compared to 2019. This is due to the reorientation towards e-business during the global COVID-19 pandemic. In terms of business areas, pharmaceutical businesses (73%), IT and electronics (69%); cosmetics and personal care items (65%) achieved the largest positive change in profitability.

In the survey, 59% of respondents said they would invest more in e-commerce channels in the near future as a result of COVID-19, because they believe in its rapid development. The distribution by business areas is as follows: consumer electronics (78%); ready-made food and beverages (77%); personal care items (75%). This confirmed hypothesis H2: the expansion of communication networks with existing and potential customers is positively correlated with the efficiency of e-business.

In the context of the pandemic, the models of the impact of COVID-19 on business performance were developed and an attempt was made to interpret their significance in order to identify the effects of the crisis on the selected companies.

It was noted that the average return on investment in the sample of companies decreased in

2020, while the return on assets increased. This explains the general economic situation when most companies during the COVID-19 pandemic tried to save their business by additional equity infusions. Calculations have shown that the more companies finance their activities throughout the crisis, the lower their return on equity.

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Appendix A

Questionnaire on the Impact of E-Business on Entrepreneurship during COVID-19 (developed by the authors)

1. Country of registration of business and country of official location
2. Business area
3. Business size according to European classification (micro, small, medium-sized, large)
4. Does the e-business platform work in the company?
5. Did the business operate during the active phase of the COVID-19 pandemic (February-June 2020)?
6. Did the COVID-19 pandemic affect the company's overall business activity?
7. Assess the impact of COVID-19 on the financial and economic performance of business as of the end of 2020 compared to 2019 (+/-):
 - 7.1. Change in the value of non-current assets (including tangible and intangible assets);
 - 7.2. Change in the size of long-term financial investment;
 - 7.3. Change in the value of total current assets (including inventories, cash, receivables);
 - 7.4. Change in long-term and short-term liabilities of different types;
 - 7.5. Change in the equity size;
 - 7.6. Change in revenue;
 - 7.7. Change in costs of raw materials and supplies (transportation including);
 - 7.8. Change in business performance (profit/loss);
8. Did the business feel government support (monetary/non-monetary) during the pandemic?
9. How long will it take the company to resume its activities after the COVID-19 pandemic?