TRADE PERSPECTIVES 2020
PERSPEKTIVE TRGOVINE 2020.

The interdependence of COVID-19 pandemic and international trade
Međuovisnost COVID-19 pandemije i međunarodne trgovine

University of Zagreb - Faculty of Economics and Business
Croatian Chamber of Economy

Ekonomski fakultet Sveučilišta u Zagrebu
Hrvatska gospodarska komora

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FOREWORD

This publication was the result of international scientific conference “Trade Perspectives 2020” held at the Faculty of Economics and Business University of Zagreb, Croatia. The conference has been taking place annually since 2010, and every year the focus is placed on the selected relevant topic from the area of trade. Due to the unexpected COVID pandemic crises, which reviled how vulnerable people, countries, supply chains and economies are, this year the conference is exploring the interdependence of COVID-19 pandemic and international trade. On the Conference, the various aspects and impact of COVID-19 pandemic on international trade will be discussed. Conference Proceedings of previous years are indexed in EconLit and JEL and this year will be submitted for indexation as well. Papers are topically oriented to the four Conference streams: Supply chain response to COVID-19 pandemic, Country response to COVID-19 pandemic, Retail and Tourism response to COVID-19 pandemic and Consumers' response to COVID-19 pandemic.

In the stream Supply chain response to COVID-19 pandemic, authors investigate trade policy measures for strengthening global value chains and local supply chains, the influence of COVID-19 pandemic onto the international logistics operations management, new organisational capabilities that foster resilience management implementation and business continuity planning. In the stream Country response to COVID-19 pandemic, authors investigate the common features of COVID-19 pandemic highly infected countries, risk of war during COVID-19 pandemic, impact of fake news on the global economy and the influence of COVID-19 on commodity futures markets. In the stream Retail and Tourism response to COVID-19 pandemic, authors analyse the retail sector after pandemic, new trading strategies on cryptocurrencies market and influence of COVID-19 pandemic on tourism market. Finally, in the stream Consumers' response to COVID-19 pandemic, authors investigate impact of COVID-19 pandemic on tourism consumers and transformation of demand patterns, changes in consumer behaviour and its satisfaction with the organization of public transport during the corona crisis.

The organization of “Trade Perspectives 2020” Conference and the issuing of this Publication have been supported by the Faculty of Economics and Business, University of Zagreb and the Croatian Chamber of Economy.

We would like to thank them for their financial and organizational support!

Zagreb, 26 November 2020

Editors

Tomislav Baković, PhD
Dora Naletina, PhD
Kristina Petljak, PhD

PREDGOVOR

Ova publikacija nastala je kao rezultat međunarodne znanstvene Konferencije "Perspektive trgovine 2020" koja se održala na Ekonomskom fakultetu Sveučilišta u Zagrebu, Hrvatska. Konferencija se kontinuirano održava jednom godišnje od 2010. godine, a svake godine fokus stavlja na izabranu relevantnu temu iz područja trgovine. Obzirom kako je COVID-19 pandemija pokazala koliko su osjetljivi ljudi, države, opskrbni lanci i gospodarstva, fokus ovogodišnje Konferencije stavljen je upravo na proučavanje međuovisnosti COVID-19 pandemije i međunarodne trgovine. U sklopu Konferencije razmatraju se različiti aspekti utjecaja COVID-19 na međunarodnu trgovinu. Zbornici radova iz prijašnjih godina publicirani su u bazama EconLIT i JEL, a i ove godine će Zbornik biti poslan na indeksaciju u navedene baze. Radovi su tematski orijentirani na četiri područja: odgovor opskrbnog lanca na COVID-19 pandemiju, odgovor država na COVID-19 pandemiju, odgovor maloprodaje i turizma na COVID-19 pandemiju te odgovor potrošača na COVID-19 pandemiju.

U sklopu proučavanja odgovora opskrbnog lanca na COVID-19 pandemiju autori istražuju mjere trgovinske politike za jačanje globalnih lanaca vrijednosti i lokalnih opskrbnih lanaca, utjecaj COVID-19 pandemije na upravljanje međunarodnim logističkim operacijama, nove organizacijske sposobnosti koje potiču provedbu upravljanja elastičnošću poduzeća i kontinuitet poslovnog planiranja. Radovi u sklopu "Odgovor država na COVID-19 pandemiju" istražuju zajedničke značajke visoko zaraženih zemalja COVID-19, rizik od rata tijekom pandemije COVID-19, utjecaj lažnih vijesti na globalno gospodarstvo i utjecaj COVID-19 na robna terminska tržišta. U sklopu proučavanja odgovora maloprodajnog i turističkog sektora na COVID-19 pandemiju, autori analiziraju maloprodajni sektor nakon pandemije, nove strategije trgovanja na tržištu kriptovaluta i utjecaj pandemije COVID-19 na turističko tržište. Zaključno se analiziraju odgovor potrošača na COVID-19, odnosno autori istražuju utjecaj COVID-19 na potrošače u turizmu i transformaciju obrazaca potražnje, promjene u ponašanju potrošača kao i njihovo zadovoljstvo organizacijom javnog prijevoza tijekom COVID-19 pandemije.

Organizaciju Konferencije "Perspektive trgovine 2020" te izdavanje ovog Zbornika podržali su Ekonomski fakultet Sveučilišta u Zagrebu i Hrvatska gospodarska komora.

Hvala im na financijskoj i organizacijskoj podršci!

Zagreb, 26. studenog 2020.

Urednici

Izv. prof. dr. sc. Tomislav Baković
Doc. dr. sc. Dora Naletina
Doc. dr. sc. Kristina Petljak

CONTENT / SADRŽAJ

IV. CONSUMERS' RESPONSE TO COVID-19 PANDEMIC

SUPPLY CHAIN RESPONSE TO COVID-19 PANDEMIC

TRADE POLICY MEASURES FOR STRENGTHENING GLOBAL VALUE CHAINS AND LOCAL SUPPLY CHAINS IN THE PERIOD OF COVID-19 PANDEMIC

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Abstract

With the spread of COVID-19 across the world global trade was decreased and many Global Value Chains (GVC) disrupted, especially in the trade of COVID-19 related products, since individual economies have significantly extended trade barriers. Furthermore, during COVID19 situation great number of small and medium farmers, agricultural producers, other small businesses faced with broken supply chains. They made the products, often, perishable either naturally or due to fashion, season, etc. Goods were needed somewhere on the market, but regular supply chain did not function well: open markets and small shops closed and service providers and consumers locked down. Owners of goods had surplus of limited duration while consumers, locked in homes, panicked looking how to buy, often inadequate quantities and products. Some attempts to install an e-market and e-commerce at the state and enterprise levels have been made. Poor functioning of these new institutions indicates that additional optimizations are needed since the physical delivery of goods didn't happen or was very difficult and costly. Changes in behaviour of two groups in marketing channels during pandemic were identified in literature: customers and retailers. The research is aimed to identification of changes in demand and customer behaviour concerning point of shopping. Using multiple channels has been known before pandemic. Research question was how COVID-19 influenced customer choice of shopping point and was this behaviour different across different segments of population.

Key words: COVID-19, supply chain, retail, e-commerce.

1. INTRODUCTION

COVID-19 pandemic has had a strong influence on both global and local supply chains. Disruptions have affected all members of marketing channels from primary producers to retailers. Furthermore, during COVID-19 situation. a great number of small and medium farmers, agricultural producers and other small businesses were faced with broken supply chains. Fulfilling orders and satisfying customer needs have been seriously endangered.

E-commerce has seemed as solution to the problem of how to reach stay-at-home consumers, which is why several researchers and even more practitioners have suggested it. Some attempts to install an e-market and e-commerce on both the national (state) and enterprise levels have been made in Serbia. Poor functioning of these new institutions indicates that additional optimisations are needed, especially concerning logistic issues. Changes in both customer and corporate behaviour have been identified within the contemporary literature. Literature review included scientific papers and studies, cases and practical experiences from business magazines.

The main research goal of this paper was to investigate how specific external influences affect global value chains and local supply chains. This translated into a research question aimed at investigating the effect of COVID-19 pandemics on omnichannel shopping behaviour.

Changes in global value chains were identified through a thorough relevant literature review. In order to investigate specific effects on local supply chains, an online survey was conducted in 2020, during August and September. In total, 164 responses from individual shoppers were gathered from the Serbian market. The survey helped us to better understand shopper behaviour in omnichannel environment during COVID-19 pandemic in Serbia. In addition, some research insights are consistent with findings from other countries. Trade policy measures for overcoming market gaps have been proposed in the paper as well.

2. INFLUENCE OF COVID-19 ON E-COMMERCE - LITERATURE OVERVIEW

COVID-19 has forced retailers to adapt their business models and accept new market reality. Significant number of online initiatives has been launched because of COVID-19 pandemic. Modern scientific literature has observed COVID-19 market phenomenon and there is a significant body of literature which analyses, estimates and predicts the effects of pandemic. However, it should be pointed out that many scientific journals require time in order to publish papers, therefore we can expect much more articles that cover this topic.

E-commerce has been a way to ensure companies' flexibility and the means of adapting to new market reality. There are claims that e-commerce saved many businesses over the world (Pejić-Bach, 2021), as they would have otherwise surely gone bankrupt because of COVID-19.

COVID-19 pandemic has changed the importance of marketing channels in many sectors. Some traditional stores had to be closed because of stay-at-home policy, whereas for some retailers the online channel has become the most important one (Burroughs and Burroughs, 2020). This has caused significant changes in logistic aspect of retail business as well.

Editorial of Journal of retailing (2020) has pointed out that COVID-19 influence on e-commerce has following consequences:

- Changes in customers' behaviour (Varade et Makhija, 2020). COVID-19 has motivated customers to adopt new ways of shopping because of the fear of going into retail stores. However, customers still want to have goods and services like before COVID-19 i.e. fitness classes now become online fitness classes and instead of going to the gym they buy in house exercise equipment. Consumers adapt and change their behaviour.
- Changes in retailers' behaviour. Retailers of non-essential goods has felt much stronger negative COVID-19 influence than food retailers. Therefore, they have to adapt their business models and find the way to reach customers who are not shopping in the stores any more i.e. they need to launch strong e-commerce initiatives. Luxury goods retailers need strong online presence not only to sell to their usual target groups but also to sell middle and even lower-class consumers which started to buy certain luxury brands.

Other authors have emphasised that online grocery shopping has significantly increased because of COVID-19 (Pantano et al., 2020). Number of confirmed COVID-19 cases is positively correlated with the possibility of purchasing food online (Gao et al., 2020). In addition, online grocery shopping has penetrated rural areas of Germany due to COVID-19, but only for a short period of time (Dannenberg, 2020).

Interesting research question is the longevity of changes that COVID-19 has caused. For example, COVID-19 has forced older population to engage in online shopping (Pantano et al., 2020). It is reasonable to expect that older consumers will continue to buy online because they have acquired new set of skills and broken trust barriers that prevented them from buying online earlier. As for online grocery shopping, adoption curve has moved up more quickly compared to the period before the pandemic and these effects are probably here to stay for the foreseeable future (Hobbs, 2020).

Statista research has shown that in some countries, such as India, China and Vietnam, the number of customers buying online is greater by half compared to the pre-COVID-19 period, while in the most developed countries such as Japan, Germany, France, USA, Canada, UK and Australia, this figure varies from 12% to 23% (Pantelimon et al., 2020).

Hobbs (2020) researched both the growth of online grocery sales and prioritisation of local food supply chains, as consequences of the pandemic. Online grocery sales have increased for both pure-click retailers and brick & click retailers alike. However, this growth was followed by significant logistical problems (Hobbs, 2020).

Gao et. al (2020) have proposed that government policy measures for strengthening e-commerce under pandemic conditions should take into consideration the following:

- Safety of food sold on the Internet (cold chain, proper handling, etc.);
- Protection of the food carriers from infection especially couriers;
- Financial support to the poor that could have problems to buy food especially in the small urban settlements;
- Helping those who lack technical skills and consequently are unable to buy food online - for examples elderly people.

All these measures should provide both safer and more efficient food e-commerce and larger population of online food customers. However, excessive and unprepared e-commerce boom could cause strong disturbances in the supply chain, which happened in many countries. Panic stockpile behaviour is more likely to be associated with online than offline channels (Hao et al., 2020). Government measures should take this into considerations and help online marketers to develop more efficient supply chains. It is very important to use all the advantages of e-commerce in the crisis situations like COVID-19 pandemic but to be aware that there are disadvantages which need to be minimised.

3. COVID-19 CONSEQUENCES ON RETAIL MARKET AND SUPPLY CHAINS

The impact of the pandemic on various areas of life and the economy is complex and practically inconceivable in such a short period of time. In the next section, only some key changes in retail will be highlighted, namely in the behaviour of customers and the behaviour of retailers, as it was announced above, using published reports and papers.

3.1. Changes in customers' behaviour

A few studies about recent consumer behaviour emerged showing recurring patterns of behaviour. The early study from China showed the change of the preferred place of shopping (supermarkets and farmers markets declined being outperformed by online channels and small shops) as well as new factors influencing the choice of shopping place like trust i.e. hygiene and usefulness impersonal online shopping (Junxiong, Hallsworth, & Coca-Stefaniak, 2020). Evolution of behaviour was observed, from the search for immunity, to purchasing of protection products, then accumulation of supplies, then life under restrictions and finally return to "new normal" (Stanciu, Radu, Sapira, Bratoveanu, & Mirel, 2020). Preference to cook at home instead to eat in restaurants was expected and sensibility to reduce spending depending on education and occupation, but not depending on gender, was identified (Vijai & Nivetha, 2020). However, expected influence of "stay at home" protocol on replacement of store with online shopping, although recorded, did not influenced German food retailers, for example, with an explanation that the stores are close, good and that online grocers suffer particularly in their "cold chain" performances (Dannenberg, Fuchs, Riedler, & Wiedemann, 2020).

Citizens suffer different fears during the COVID-19 pandemic, but it is noticeable that fears manifest differently in different countries. USA research shows fear from unavoidable contacts in stores: 78% of women would not feel safe while testing cosmetics and around two thirds are reserved to try clothes in dressing room or consult with sales assistants (Salpini, 2020). Customers who do not want (or cannot) leave their homes, are increasingly using services of home delivery offered by joined effort of retailers (e.g. Walgreen or 7-eleven) and delivery company DoorDash (Walk-Morris, 2020), or even with the support of shopping support software (Hero by Shopify) enabling chat of the customers with sales associates in nearby stores (Williams, 2020).

Study from SEE region reports that citizens of Serbia and Croatia are much more concerned about the family (68%) than citizens of Slovenia (44%). On the other hand, Slovenians are most concerned about the economic consequences (69%). BiH citizens have evenly distributed their fears, and despite sociological similarities, even they are more concerned about losing their jobs (14%) than Serbian citizens (10%) (Valicon, n.d.).

These different reactions to the threat will also cause different reactions in consumption. Fear for family can be expected to cause increased spending on stocks especially of medicines and hygiene materials, while fear for workplace is likely to induce savings and abstinence from consumption and investment. Also, it can be noticed that according to the same research, the first good news at the beginning of June caused a significant number of responses (40%) about the intentions for undiminished family investment.

There are different changes in customer behaviour emerged as the consequences of pandemic influences on supply chain. Disloyal moments in shopper's behaviour is one of the most obvious changes: due to the irregular replenishment of stocks, shoppers faced with the dilemma either to buy some new brand or to skip the purchase. Most of them have chosen to try something new, which posed strategic challenges to brand owners and retailers (Cua, 2020). Producers are urged to monitor tightly marketing channels trying to avoid stockouts while retailers are advised to focus on SKUs providing incrementality. It means that retailers further streamline assortment leaving brands with low cannibalization.

The desire and willingness to track orders existed even before the COVID-19, when 70% of respondents stated that the top three reasons for choosing an online shopping place include the ability to track the order, while 56% said it was the main reason for choosing when buying expensive items (RetailDive, 2020). During the pandemic, this tendency only intensified due to excess time, nervousness and limited other shopping opportunities, as well as delays in deliveries.

3.2. Changes in retailers' behaviour

On the macroeconomic level it observed that stock market reacts, with the lag of 5-7 days on the Corona virus mentions in official company reports (Stephany, et al., 2020) with the different influence over the sectors. Survey from Serbia reports that 74% of businesses had lower performance than planned in first half of 2020, pointing out major barriers categorized as operative (short working hours, transport of employees etc.) and supply chain barriers (cost of transport, international sourcing, local sourcing and ever price increase) (CEVES, 2020). According to official estimates recession in Serbian economy is expected in 2020 with, according to Survey I, from April 2020, 60,5% of firms drastically reducing productive capacities and 91% of them expecting problems to meet liabilities (OECD, 2020). Although, according to quoted CEVES report, food sectors were less influenced, production and wholesale suffered more than retail, while tourism and hospitality industry were badly damaged.

Supply chains, already challenged with climate change, floods and new consumer behaviour (22% increase of meet-free food in 2013-2018 period), finally are about to collapse during COVID-19 pandemic since 46% of procurement professionals admit to make decisions without needed insights (MINTEC, 2020). Solutions capable to integrate great number of global carriers, selling companies and customers in different countries became a "need" in order to enable cross-border shopping and smooth delivery to the client (RetailDive, 2020). Warehouses, confronted with increase in volume turnover but also with uncertainty concerning future, are advised to adjust strategy immediately, to be innovative in re-tooling the operations and to preserve long-term relationships, with partners and experienced professionals (OpenDock, 2020). With more than 2000 parcels shipped each second and 26% customers ready to abandon shopping cart if delivery is not fast enough, supply chain companies are forced to deploy machine learning systems with capability to learn and improve themselves, cutting the costs as well as the time of delivery (Manhatten Associates, 2020).

4. GAPS IN SERBIAN SHOPPERS' BEHAVIOR IDENTIFIED DURING COVID-19

In order to analyse the shopping behaviour during COVID-19 pandemics in Serbia, an online survey was conducted in 2020 during August and September. In total, 164 responses were gathered. Women accounted for 69.51% of all respondents, while the average age of respondents was 40.31 years. These numbers roughly adhere to the demographic situation in Serbia. Of all respondents, 96.34% possessed higher education (remaining had secondary education). This distortion is mainly caused by the surveying method and approach, as the academic network was used as the basis for contacting potential respondents and distributing the questionnaire.

4.1. Shopper behaviour in omnichannel environment during COVID-19

One aspect of the conducted empirical research was aimed at understanding shopping behaviour in multiple channel environment and how specific COVID-19 conditions influenced the change in established shopping habits. In this regard, the use of offline and online channels in the observed sample was analysed. The data shows that physical stores remain undisputed go-to channel for the majority of shoppers in Serbia, closely followed by websites and e-stores. This implies that e-commerce is gaining a strong foothold in transitioning markets, such as Serbia. The fact that every third respondent purchases via mobile apps implies very high effects of ICTs influx, both on corporate, as well as individual level. On average, respondents used 2.45 channels for shopping, which indicates significant shift in customer behaviour. These findings are presented in Figure 1.

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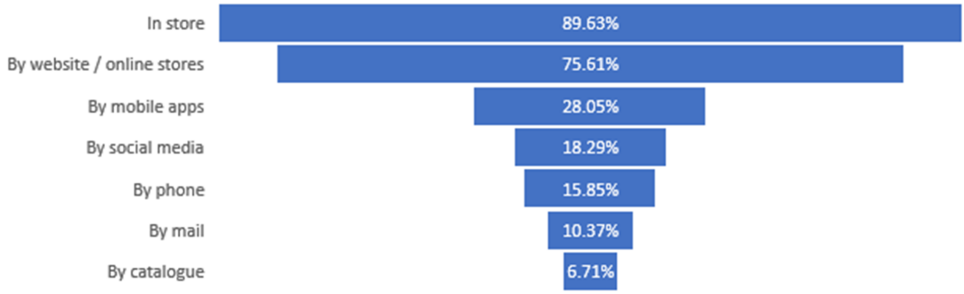
Figure 1. Frequency of specific channel usage in the sample (N=164)



In order to further the understanding of multiple channel shopping behaviour, specific channel combinations were identified and analysed. In total, 36 different shopping patterns, in terms of channels used, were identified. Most common ones are depicted in Table 1.

Table 1. Identified shopping patterns

Channel combinations	Respondents	Share
Store	27	16.46%
RESPONDENTS COMBINING OFFLINE CHANNELS	*27*	*16.46%*
Store + website/e-store	45	27.44%
Store + website/e-store + mobile apps	17	10.37%
Store + website/e-store + social media	8	4.88%
Store + website/e-store + mobile apps + social media	7	4.27%
Store + website/e-store + mail	5	3.05%
Store + website/e-store + mobile apps + phone	5	3.05%
Other offline and online channel combinations	33	20.12%
RESPONDENTS COMBINING ONLINE AND OFFLINE CHANNELS	*120*	*73.17%*
Website/e-store	6	3.66%
Website/e-store + mobile apps	5	3.05%
Other pure online channel combinations	6	3.66%
RESPONDENTS COMBINING ONLINE CHANNELS	*17*	*10.37%*
TOTAL	*164*	*100.00%*

Within observed patterns, we can distinguish between three specific categories. Shoppers using both offline and online channels are by far the most frequent. As almost two thirds of these shoppers combine offline shopping with two or more online channels, we can conclude that the development of omnichannel retail is present and significant on Serbian market. This can be only increased as more and more shoppers start to widen their channel scopes. Interestingly, more than 10% of all respondents refrain from offline shopping. This interesting and unexpected figure is a reassuring sign for e-businesses and digital startups from Serbia, as pure-click shoppers have become a significant and viable market segment, rather than a specific market niche. However, this conclusion must be tested after official end of COVID-19 crisis, in order to check whether the commitment to online shopping is the result of fear of infection or a long-term commitment.

To comprehend identified shopping patterns, a detailed understanding of shopper profile is required. In this sense, we focused on observing specific socio-demographic and psychological parameters. These are presented in Table 2.

Table 2. Shopper profiles regarding their channel choice

Channel combination	Share of shoppers feeling under heightened risk during COVID-19	Share of male shoppers	Average age	Average household size
Online channels only	42.9%	35.7%	35.79	3.57
Offline channels only	11.4%	25.7%	45.14	3.17
Offline and online combined	15.7%	31.3%	39.95	3.23

The survey showed that almost half of respondents who shop exclusively online think they are under heightened risk during COVID-19 pandemics, which is significantly higher than in the other two groups. This implies that external conditions have a profound influence on shopping behaviour, especially on specific market segments. This is the case of shoppers with endangered health, who are utilizing the benefits of online shopping to reduce the overall risk, this time during shopping activities. When it comes to strict offline shopping, this shopper segment is notably different compared to two other observed profiles in terms of average respondents' age. This was somewhat expected, as the older members of the population are more internet and technology aversive, thus also less likely to shop online (Lian & Yen, 2013). Interestingly enough, women constitute three quarters of respondents refraining from online purchasing.

In order to examine how the COVID-19 directly influenced shopping behaviour in terms of channel use, we drew upon aforementioned results and analysed whether specific COVID-19 conditions caused significant changes in our respondents' behaviour (Table 3).

Table 3. Shopping behaviour in relation with the outbreak of COVID-19 pandemics

BEHAVIOUR	RESPONDENTS	SHARE
Share of respondents shopping online	129	78.66%
Share of respondents shopping only offline	15	9.15%
Share of respondents shopping online, but not during COVID-19 pandemics	20	12.20%
Share of respondents who usually do not shop online, but did so during COVID-19 pandemics	0	0.00%

The analysis showed that 12.2% of respondents who used to shop online ceased to do so during COVID-19 pandemics. This unexpected behavioural change can be explained by the emphasized weak points in e-tailers supply chains, which were stressed to the breaking point during the period of march-august 2020. Customers ceased to shop online either because of the logistic issues, such as queuing, long waiting and arrival times, irregular supply causing product shortages, as well as problems with deliveries in certain remote areas. The dependence on other supply chain members, such as couriers, indicates the relatively vulnerable position of e-tailers, especially in developing markets, with lacking infrastructural support. Low capacity of e-tailers' capacity to process and fulfil orders is also a significant issue. It is also to be explored in some further research whether the prevailing online shopping goods in period before COVID-19 (e.g. travel services) which significantly fell on the shopping rank list caused this discontinuation of online shopping.

For small group of traditional shoppers, the outbreak of COVID-19 was not a strong enough driver to change their habits and overcome e-commerce aversiveness, as none of our

respondents exhibited such a behaviour. Since this was online survey, it is to be reminded that those respondents obviously do have internet access.

4.2. Generation gaps as a shopping behaviour driver

In order to complete the picture of sales channel usage is Serbia, channel shopping choices were combined with generation group affiliation. In analysed sample, Baby Boomers accounted for half of the respondents (50.63%), whereas members of the generation X formed 40.63%. Generation Y and generation Z formed 4.38% of the sample, each.

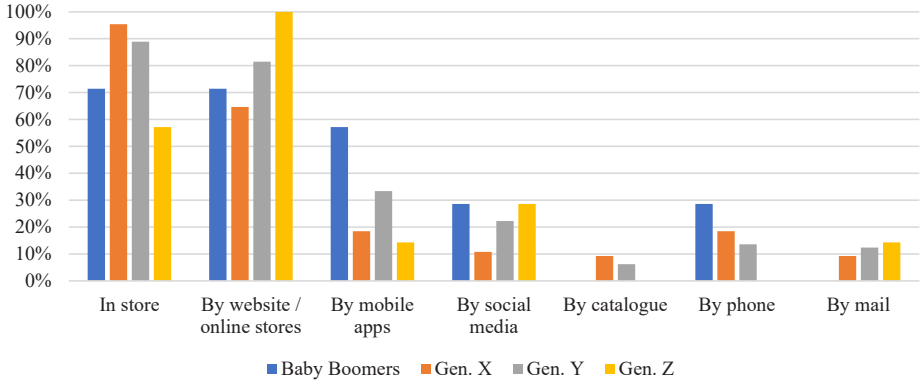
Initially, we focused on how many channels an average representative of the generation uses, to understand the omni channel potential amongst different generation groups (Figure 2).

Figure 2. Number of channels used per average generation member

The analysis showed that Baby Boomers are most willing to combine different channels when shopping, whereas the youngest generation group is the most reserved in this sense. This can be explained by the fact that older generation are caught in the intersection between traditional, offline channels and new modern, digital ones. Lingering habits are combined with the tendency to modernize shopping behaviour in certain segments. On the other hand, members of the generation Z have been under the heavy influence of modern ICTs and consequent digitalization of every aspect of the life. Therefore, they are mentally predetermined towards digital channels and maybe have no such a developed offline channel awareness, like the members from other generation groups.

To understand this phenomenon in deep, a detailed analysis of the usage of each observed channel within the generation group was performed (Figure 3).

Figure 3. Channel usage share per generation



Survey results point out that all generation Z members do their shopping via websites and e-stores, far more than any other generation group. On the other hand, they do not shop by phone, nor by catalogue. Very important to notice is that Baby Boomers are most inclined to shopping via mobile apps, compared to all other group. In terms of buying via social media, Baby Boomers and generation Z have the same share. However, the findings in this analysis of generations should be taken with reserve, as the two subsamples (generations Y and Z) are significantly smaller compared to the other two remaining generation groups.

5. TRADE POLICY MEASURES AIMED AT OVERCOMING MARKET GAPS

Basic operational measures stemming from some early experiences with SARS in 2004, were mainly repeated during COVID-19 pandemic: hygiene preventive measures (isolation, physical distance, frequent disinfection of busy areas) and restrictions in movement imposed by public authorities (limited border crossing, monitoring of isolation directives and new regulations or even suspension of regular medical services) (Siu & Wong, 2004). New operative measures that COVID-19 brought are related to public circulation of new hygienic and safety standards, trainings and other forms of regular knowledge update (OECD, 2020). Experience with a lot of problems in logistics highlight the need to introduce changes, and possibly to support retailers to acquire some new technologies (thermo boxes, thermo-vehicles), to re-arrange stores (drive-through, click and collect boxes), to introduce new applications (web/mobile shopping, parcel tracking, delivery fleet task loading in real time) and to protect sales and delivery personnel from infection.

Economic and financial measures are usually applied to all economic sectors, and no special measures for retail were identified. Most frequently used financial measures during pandemic period were support to liquidity and to deal with labour supply shortages on the level of retail companies and most important economic measure was to support maintaining competition in retail sector (OECD, 2020). Many of measures were combined, so that financial support was directed to support wages in Italy (500 EUR) or in France. In West Balkan region, governments of Serbia and North Macedonia introduced support to wages but with of employer to keep employees for certain period of time after support expires (Horwath, HTL, Forthcoming). Same report enlists some other financial measures applied generally to all sectors, like moratorium on bank loan repayments, support to employee provident funds, etc. Financial support was directed also to prevent bankruptcies and, in that respect, to keep competition, which is crucial economic goal. Rarely some non-market economic measures were applied, like utility cost control and interest rate control.

Global impact measures are promoted by the international organizations like World Health organization and Food and Agriculture Organization waring that millennial goals are closely connected with the non-desirable impacts of COVID-19. These UN agencies are listing as the most urgent issues of global warming, environmental problems, but also predatory loans, exploitation of children and other ill use of current situation (WHO, 2020).

Road to recovery measures cover set of planned activities directed to provide recuperation and further development of retail sector in so-called “new reality”. It is to be expected that some of above listed undertaken measures will be extended as a support in post-COVID times. New measures important in post-COVID period are: VAT rate reduction supporting consumer spending, further rescheduling of obligations (social security, VAT), further utility cost control (rent) and more extensive support for frequent testing of employees (EY, 2020). Other important post-COVID activities of new business model introduction will for sure ask for further digitalization of retail companies (Horwath, HTL, Forthcoming), but

also help to (older) citizens to learn how to shop online, which also can be supported by public administration since it increases overall competitiveness of the economy.

6. CONCLUSION

A long list of reports from international organisations and consulting companies has already been published in a very short period of time, which indicates the great impact of the COVID-19 pandemic on society and the economy. This research represents a contribution to the overall COVID-19 literature based on the primary online research conducted on the Serbian market. The main conclusions obtained by researching the reactions of Serbian consumers during the pandemic are:

- High percentage of surveyed citizens reported the feeling of fear of shopping during pandemic, and they react predominantly by switching in larger extent to online shopping;
- Shopping in-store is still the most wide-spread way of shopping in Serbia. However, results indicate that vast majority of customers combine channels, implying that in-store shopping is becoming part of complex experience;
- Online shopping was present before COVID-19 and use of this channel was accelerated by pandemic. Use of multiple channels was present and it is amplified in under the influence of COVID-19;
- There is emerging new segment of shoppers who perform only online shopping. There are indications that young population, belonging to Z generation prevails in this segment.

The presented research examined specific external influences on value chains and effects on local supply, revealing that numerous variations were taken, especially in retail, of the same measure, namely the adoption of new health and hygiene standards. The justification of the assumption that customer behaviour in a multichannel environment changed during the COVID-19 pandemic in Serbia has been confirmed, and this assumption can be tested in a more rigorous analysis.

This research had certain limitations. The most important is certainly connected with the online method of data collection. Sample deviations (high share of higher educated) stem from obvious correlation between level of education and use of internet. Also, desire to keep attention of respondents limited number of questions, so some insights are missing, like impact of type of category on online shopping during pandemic. These, and other limitations are actually guideline for further research, which for sure will be needed.

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THE INFLUENCE OF COVID-19 PANDEMIC ONTO THE INTERNATIONAL LOGISTICS OPERATIONS MANAGEMENT

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Abstract

Managing international logistics operations involves numerous complex activities such as transport, supply, warehouse, procurement and IT within the global surroundings. Management of such operations thus represents a very complex coordination of a great number of actors and procedures. The stated coordination refers to numerous elements which are analyzed. This firstly addresses the configuration of the international logistics network, followed by the organization of logistics activities in the sense of ordering goods, warehousing and supply management within the business knots, finally considering the cost and time components, as permanently present limiting factors. The additional complexity of international logistics operations which is the subject of analysis within this paper is to revise the influence of global COVID-19 pandemic present since the beginning of 2020. The analysis within the paper starts from the impact review of the pandemic onto the sector, followed by the main strategic and operative responses to the crisis, summarizing with key directions of future international logistics operations management. The aim of the paper is twofold. First, to revise in detail the complexity of managing international logistics operations, with all its peculiarities regarding the differences within business management, success metrics, currency, lingual, cultural and sociological discrepancies which these operations can bring along with them. Second, to indicate the degree of readiness of international logistics sector to cope with the global COVID-19 pandemic and define the main measures of future strategic and operative actions in order to strive and remain in the ever so turbulent contemporary business market.

Key words: COVID-19 pandemic, international logistics, operations management.

1. INTRODUCTION

Market participants operating in an international logistics environment play a key role in bringing together different markets around the world. They provide a wide range of services that include the organization of transport, regulation of accompanying international documentation and compliance with applicable laws of the participating countries in the exchange process, ensuring uninterrupted global procurement and supply, adequate storage capacity, and coordination of a large number of providers in the process (Chopra and Meindl, 2013; Creazza *et al.*, 2010; Mangan *et al.*, 2008).

It is noticeable that any kind of downtime and interruption in the functioning of logistics providers has a very negative impact on the performance of the entire global economy. The most common cause of severe disruptions in the functioning of global logistics are humanitarian catastrophes of any kind. Some of these catastrophes are pandemics of certain viruses and diseases that have paralyzed the world several times in human history. Nowadays, we are witnessing one such catastrophe in the form of the COVID-19 pandemic, which caused a drastic decline in the volume of business activities of almost all entities, including logistics providers

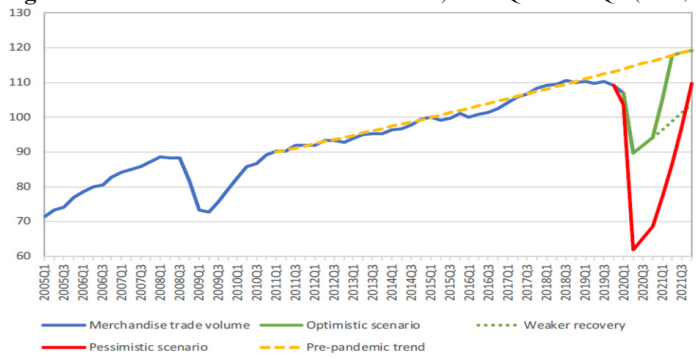
and partners in the logistics chain. As a result, the market for logistics services is significantly endangered, and future business operations are uncertain for a large number of players due to another danger looming over the global economy in the form of an economic crisis. The latter struggle for survival will force the market subjects to respond adequately to the given circumstances and consequently new business models will be developed.

The paper has two aims. The first aim is to perform an in-depth analysis of the complexity of managing international logistics operations, including all the specifics concerning the differences within business management, success metrics, currency, lingual, cultural and sociological discrepancies which these operations can bring along with them. The second aim is to indicate the degree of readiness of the international logistics sector to cope with the global COVID-19 pandemic and define the main measures of future strategic and operative actions in order to strive and remain in the ever so turbulent contemporary business market. Apart from the introduction and conclusion, the paper is divided into three parts. The first part deals with the impact of the Covid-19 pandemic onto the global logistics sector. The second part analyzes the logistics responses to the global pandemic crisis. Finally, the third part of the paper offers future directions of managing global logistics in the context of uncertain business conditions. A detailed analysis of all mentioned parts follows.

2. IMPACT OF THE COVID-19 PANDEMIC ONTO THE GLOBAL LOGISTICS SECTOR

Every aspect of the global economy has felt the impact of the COVID-19 pandemic, including logistics. Unlike other disruption risks, the epidemic outbreaks start small but scale fast and disperse over many geographic regions creating a lot of unknowns which makes it difficult to fully determine the impact of the epidemic outbreak on the supply chain and the right measures to react (Ivanov, 2020). The Coronavirus affects logistics on a global scale remarkably. Many countries have imposed substantial restrictions on border traffic. In line with this, many governments have imposed lockdowns of citizens and of many businesses. These lockdown policies are considered to be a necessary part of the response to the outbreak. Governments' response to the virus outbreak by restricting trade and the shipment of goods causes disorders of shipments in terms of shipment delays and cancellations. As a result, freight forwarders and logistics as a whole face many hurdles in trying to mitigate the impact of the virus.

Figure 1. World merchandise trade volume, 2005Q1–2021Q4 (Index, 2015=100)



Source: Garry, M. (2020).

Figure 1 demonstrates the tremendous effect COVID-19 pandemic has on global trade volumes. As it can be seen, the effect is similar to the effect of the crisis from 2008. The trade

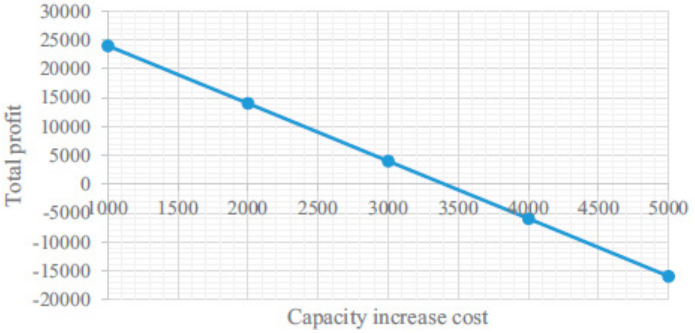
volume plunged in the first quarter of 2020 which affects logistics in the way capacity is not utilized sufficiently.

To be precise, the impact on logistics is twofold. Firstly, business activities decline and capacity becomes unused and must be reduced due to the cost of owning capacity. Secondly, strategies, philosophies and business models are changing as well as connections in the logistics chain. According to performed interviews, it can be identified that the effects of the virus that seem to be emerging are related to four specific areas: (1) state of globalization, (2) a unique bullwhip effect, (3) the resurrection of lean and local production and (4) risk-recovery contingency (Handfield *et al.*, 2020). State of globalization affects the routes of transport and facility locations due to the change of production locations. The bullwhip effect forces logistics to deal with bottlenecks in a supply chain. Furthermore, the resurrection of lean and local production change logistics patterns of goods production and distribution from global to local. When it comes to risk-recovery contingency, logistics strategies can include the decision of production reduction or even production suspension for the foreseeable future. In addition, business logistics must take into account the humanitarian aspect, where human life is most important. Therefore, it is necessary to gain the satisfactory level of profitability, but to achieve this in a way that the lives of employees and consumers are protected from the potential infection.

As organizations work to enhance service offerings, third-party logistics (3PL) providers play a liaison role amongst supply chain organizations, orchestrating resources between manufacturers, retailers and consumers (Zacharia *et al.*, 2011). Within the supply chain, the sudden shifts in demand and health-related regulations have caused profound disruptions such as farm workers not being available to harvest crops, the collapse of the food service/restaurant sector and changing working conditions in food processing plants thus inhibiting productivity (Mollenkopf *et al.*, 2020).

Primarily, the efficiency of transport and storage capacities is jeopardized. There is a surplus of transport capacities in the form of the number of transport vehicles, as well as the capacity of an individual transport vehicle. Likewise, there is storage capacity that has not been fulfilled to the extent that it was in the previous period. This is the reason why storage per unit now costs more, which burdens the cost side and thus the pricing policies of other participants in the logistics chain. Within Figure 2 it is shown that capacity increase cost affects total profit of the businesses in a negative way.

Figure 2. Impact of capacity increase cost on the total profit

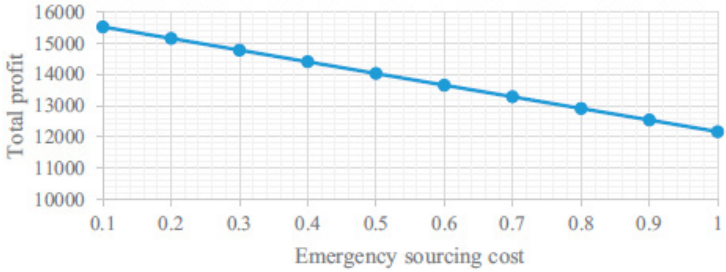


Source: Paul, S., K., Chowdhury, P. (2020).

On the other hand, in some areas, there is excessive demand in a very short time, which puts pressure on logistics to meet the sudden increase in demand and to avoid shortages that

can lead to empty facilities. Emergency sourcing is expensive which is depicted in Figure 3. Unfortunately, companies could not be able to anticipate future trends within pandemic period.

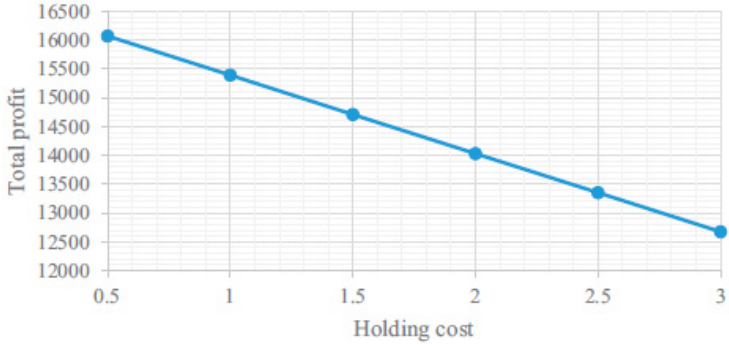
Figure 3. Impact of emergency sourcing cost on the total profit



Source: Paul, S., K., Chowdhury, P. (2020).

Furthermore, goods remain in warehouses longer due to lack of demand in some areas which increases holding costs and lower profit. Within Figure 4 it is shown that over the period holding costs lowers profits significantly. The product flow has stopped suddenly and an abundance of warehouses worldwide has become filled with goods that cannot be sold. Consequently, they are expensive to operate and therefore inefficient.

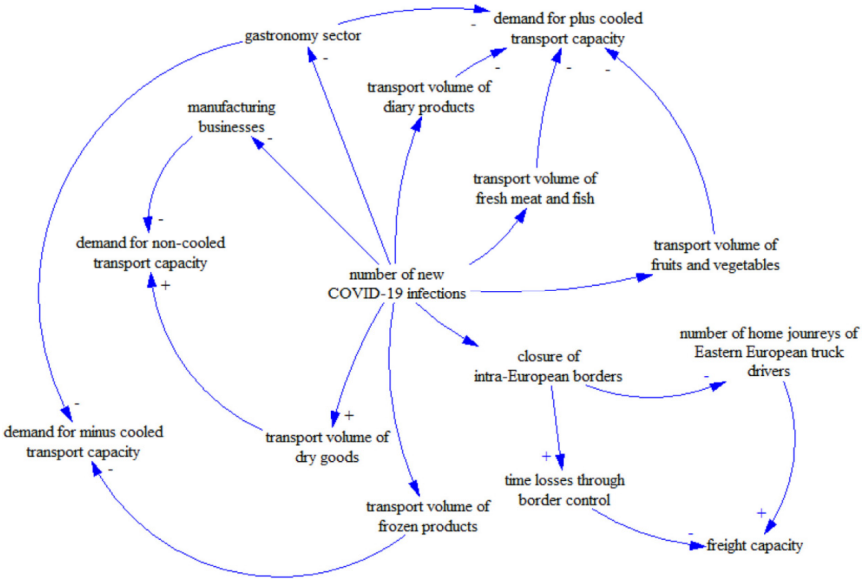
Figure 4. Impact of holding cost on the total profit



Source: Paul, S., K., Chowdhury, P. (2020).

Figure 5 illustrates the impact of COVID-19 onto transport volume and demand. It illustrates clearly how measures and processes affect the demand for transport capacity and freight capacity itself in Germany, in a positive or negative way. A large number of non-cooled transport capacities from the manufacturing business, as well as plus cooled transport capacities from the gastronomy sector are available on the freight market due to the sector's shut down enforced by the German government (Loske, 2020).

Figure 5. System dynamics framework for the impact of COVID-19 pandemic onto transport volume and demand



Source: Loske, D. (2020).

It is also important to mention the pressure that logistics suffers when it comes to medical equipment and medicines. Primarily due to the drastically increased demand for equipment that is difficult to obtain. Typically, the majority of countries produce more of the equipment which requires logistics to make it feasible to produce and deliver the equipment in the short notice to the most endangered regions. Furthermore, it can be challenging to import the equipment due to distance and lockdown measures. Alongside the importance of providing medical equipment, another equally vital issue is handling the infectious medical waste generated in diagnosing patients and treating them (Kargar *et al.*, 2020). Medical waste is dangerous and it is crucial to handle it properly through disposal networks, but a waste disposal network that had been established before the pandemic started is currently overloaded. Thus, a regular waste disposal network can face a lack of capacity due to capacity switch to medical waste disposal. Consequently, this can cause environmental problems besides logistics problems. Additionally, the use of plastics has increased significantly since the pandemic outbreak. A considerable increase in plastic usage has been related to requirements packaging, and single-use items related to the demand for food/goods delivery and take out, as well as plastics for medical purposes (Fan *et al.*, 2020).

3. LOGISTICS RESPONSES TO THE GLOBAL PANDEMIC CRISIS

The situation in the world is unfavorable, but everyone must adapt and move forward. Every business entity strives to operate profitably and in accordance with market opportunities and possibilities. There are various models and methods of adjustment and we are currently witnessing a convulsive struggle for the survival of most entities in the global market. To create and implement the right strategy a lot of information and knowledge is required. Some approaches are more successful than others due to different circumstances and possibilities.

Furthermore, the distribution patterns are changing almost weekly, whereby the importance of different transport modes is switching for certain regions in the world.

While it can seem like things are out of control with airfreight, airlines are taking three key measures to alleviate the stress (Flexport, 2020):

1. Increasing utilization of freighter flights: Airlines are doing this by decreasing ground time, deploying more freighters on longer routes, and postponing maintenance cycles.
2. Bringing old aircraft out of retirement: Most planes would need significant maintenance to be operational again, but it's a strategy that could help fill the void.
3. Using passenger planes as cargo planes: while not the most cost-effective way to transport large amounts of cargo, it is possible to fly a 777, 787, A330, or A350 with cargo profitably, given the price points in the market today. These planes carry up to 30 tons or 150 cubic meters of cargo-remarkably smaller than 747 freighters with 130 tons and 700 cubic meters of capacity. Some airlines go a step further and remove seats from the upper deck or load loose cargo on the seats.

On a global scale, it can be seen that transport routes from East and Southeast Asia to Europe are changing due to "blank sailings" introduced by ocean carriers. Therefore, railways are taking the lead in transporting goods over long distances, where water traffic is drastically reduced. Rail freight is considerably faster, especially given the transit times involved with shipping around the southern tip of Africa, which, as mentioned, is currently the preferred route of many maritime carriers for services from Asia to Europe (Logistics Bureau, 2020). In 2019 *Maersk* introduced the *AE19* service. It complements Maersk's regular Asia-Europe product offering based on conventional ocean services and offers highly competitive transit times from Asia to major ports in Europe. The service is based on a short-sea connection between Asian origin ports in Korea, Japan or China and the port of Nakhodka in the Russian Far East (operated by Sealand Asia- A Maersk Company), followed by an intercontinental rail connection across Russia from Nakhodka to St. Petersburg, which takes 11 days (Mihajić, 2020). The last leg of the product is another short-sea connection between St. Petersburg and ports in Finland (Helsinki and Rauma), continental Europe, such as Gdansk (Poland), Bremerhaven (Germany) or Scandinavia, operated by Sealand Europe. In September 2020, thanks to the increased customer interest, the combined ocean-rail product becomes a permanent weekly service.

Due to the efforts to limit the virus spread, novel safety measures are introduced. Firstly, some companies have introduced new measures on physical distancing at warehouses, where certain number of workers are allowed to be at the same time. Consequently, the capacity of those warehouses is decreased, as well as goods flow, because fewer employees are present. Secondly, disinfection of work areas or providing protective gear gives employees the feeling of safety, but slows down warehouse processes. Finally, giving staff unlimited unpaid time off is the measure that limits the flexibility of logistics, especially when it comes to sudden change on the market which is a common situation temporarily. These efforts come at a higher financial cost and affect the companies' profitability. Yet, they cannot guarantee protection against outbreaks in confined warehouses. *Amazon* has introduced similar measures in its facilities (MacDougall, 2020). In warehouses, like those operated by Amazon and Walmart, robots were already used to improve efficiency (Thomas, 2020). The Covid-19 outbreak has forced both companies to increase the use of robots for sorting, shipping and packing.

The highest priority is to help ensure the health and safety of company's employees, customers, and suppliers while meeting service commitments. Here's what can be expected from UPS (UPS, 2020):

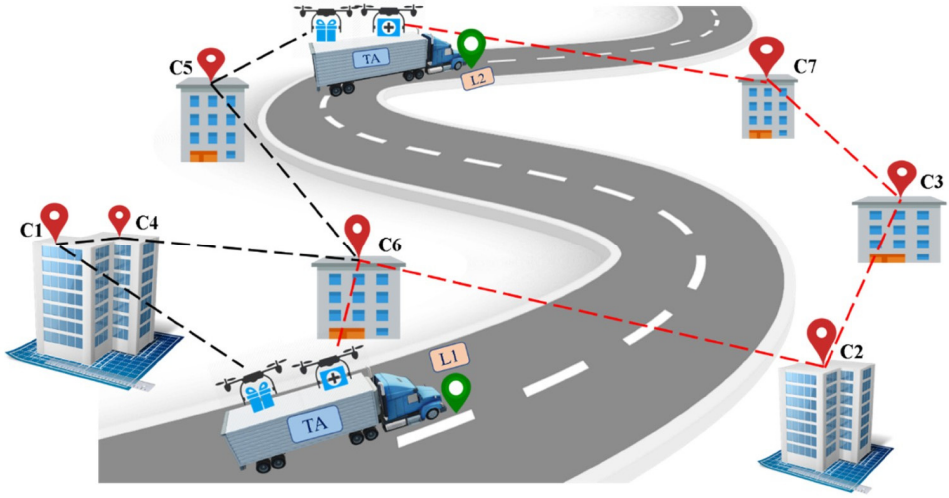
- "Constant monitoring of air and ground networks to address potential sources of disruption in air and ground networks.

- Compliance with applicable government regulations related to the containment of Coronavirus.
- Careful guidance and information being provided to staff across the globe regarding the best ways to prevent the spread of infection, based on guidelines from the World Health Organization (WHO).
- Ability to track your deliveries worldwide on ups.com.
- Where available, it can be signed up for the free UPS My Choice which enables to provide more specific delivery instructions such as where to leave deliveries, where to redirect them and the ability to receive delivery notifications."

Uber is one more company facing problems with Coronavirus. Facing sudden disruptions on the market *Uber* quickly adapted their activities and business model to offer a novel technology solution through *Uber Direct* (White, 2020). This solution helped businesses struggling with high delivery demands to use the *Uber* network of drivers and delivery partners for their operations. This also created further opportunities for drivers and couriers to gain revenues. Furthermore, *Uber* in Kenya and South Africa waived activation fees for new restaurants and made it quicker and easier for new restaurants to join *Uber Eats*, aiming to reduce wait times to less than 24h for new sign-ups (Scheepers and Bogie, 2020). Additionally, restaurants are allowed to use the option to receive daily pay-outs, a novel feature launched by *Uber Eats*.

The theoretical solutions that appear within the literature for overcoming difficulties in supplying the population during quarantine are also important to be mentioned. The part of logistics that has the potential to overcome this rough period very successfully is the last-mile delivery. The reason lies in the people's need to make purchases as they used to, in terms of quantities and product types, but due to the fear of infection, they avoid going to traditional retail facilities. Fortunately, it is feasible to establish the on-time delivery without any physical contact with customers resided in highly infected zones.

Figure 6. Coordination of drones and delivery trucks for the last-mile delivery



Source: Singh *et al.*, (2020).

Figure 6 presents the last-mile delivery in the highly infected regions. To perform delivery operations in these zones, one delivery truck with two types of drones is needed. Drone-A (DA)

is committed to food items and Drone-B (DB) for medicines. Drones have scheduled delivery path. Customers, C1, C4, C5, and C6 are served by Drone-A as per their food requirements and Drone-B is assigned for the medicine to customers, C2, C3, C6, and C7. Customers C6 have the flexibility of ordering both types of items. Delivery truck and drones are supposed to serve all the assigned customers with predefined time windows in a synchronized manner (Das *et al.*, 2020). The objective of the model is to fulfill the on-time delivery of food and medicine to customers who stay in a quarantined place by minimizing the overall operational costs (Singh *et al.*, 2020). Delivery time, time window, and distance need to be planned to serve customers one by one in the most efficient way. The capacity of delivery truck and drones serve to fulfill the demand. Within Figure 6 it is depicted how this delivery operates for paths TA-C1-C4-C6-C5-TA and TA-C6-C2-C3-C7-TA for Drone-A (DA) and Drone-B (DB), respectively. Truck-A (TA) is also moved from location L1 to L2 in accordance with travel time of both drones.

4. FUTURE DIRECTIONS OF MANAGING GLOBAL LOGISTICS IN THE CONTEXT OF UNCERTAIN BUSINESS CONDITIONS

In the future global market uncertainty and high risk is inevitable, which will raise the competitive struggle to a new level. Business activities will be conducted under constant pressure to maintain costs at an acceptable level and to keep the capacity for the period when global business activity returns to a scale close to the pre-pandemic period. Furthermore, businesses operate in the currently unfavorable market conditions with the potential economic crisis that is ahead and anticipate the moment of return to the old business volumes.

It can be expected that companies will increasingly consider China-plus-one strategies as a response strategy towards procurement independency. What other countries will benefit from supply chain investments will depend largely on their own investments to boost manufacturing capability, as well as provide attractive offerings for land, labor and logistics (Hedwall, 2020).

The recovery and long-term impact of the pandemic onto logistics may be affected by the following adaptations and factors (Twinn *et al.*, 2020):

- "Increased dedicated air cargo capacity: The airline industry is already reallocating fleet to exclusively serve air cargo demand.
- Increased cargo inspections and cross border control protocols: Temporary trade embargoes and export restrictions for sensitive cargo (such as medical supplies, pharmaceuticals) have already been established. In the longer term, logistics costs may increase due to tighter cross-border processes and controls fueled by concerns regarding the transmission of diseases.
- Technology and e-commerce rise: Logistics has been in the midst of a tech-driven revolution. In the long term, robotics, drones, and autonomous vehicles might reduce logistics services providers' exposure to labor shortages.
- Reconfiguration of global value chains: Many of vulnerable supply chains may shorten or diversify through reliance on alternative partners or intensified efforts to bring home strategic value chains. The shortening of supply chains may benefit countries with capable manufacturing sectors and beneficial exports' policy (for example, Colombia, India, and Mexico) to partially substitute China over the medium term. There may also be a trend towards placing additional warehousing capacity or dry ports near demand centers to shorten the time to get goods to market.
- Recovery prospects will vary by country, subsector: As logistics is a diverse sector, recovery prospects will vary depending on the length of lockdowns and the duration of the subsequent economic crisis. Large companies with a diversified business (such as

multiple clients, serving different sectors in various countries/states) will be better placed to weather the storm."

This crisis likely established e-commerce growth as a lasting trend. The e-commerce ecosystem provides low-cost tools that empower small businesses. Low-cost and lower-risk solutions with fewer barriers to entry and concern over hygiene and lingering fears of the pandemic will probably greatly favor e-commerce. Therefore, last-mile delivery and the technological development that is happening in that sphere of logistics in the form of unmanned aerial vehicles would improve logistics significantly. The application of robots is diverse. Thus, it can be used for disinfection, food and items delivery, monitoring human temperature and people in public places, food preparation, and telepresence (Bogue, 2020), as well as robotic systems for warehouse operations (Yuan & Gong, 2016).

5. CONCLUSION

The logistics services market has felt the strong impact of the COVID-19 pandemic. Also, the trade volume plunged in the first quarter of 2020. In some places, logistics activities have increased, while in others a reduction or complete suspension has occurred. As a result, the capacity of the distribution network is overcrowded or underutilized. Additionally, distribution routes are changing, as are the utilization of different means of transport. The reasons are numerous, from disruptions in demand, through disruptions in production, to government measures.

It is important to come up with an adequate strategy for adapting to new circumstances. With an appropriate approach the fight for survival can be won and the basis for potential growth in the coming period can be established. Thus, companies will almost certainly scramble to reshape their supply chains in the wake of the crisis. Some will relocate from countries like China and diversify suppliers. Furthermore, the constant process of learning and accepting innovations, especially in the technical-technological sense, is an essential need of every business entity and only such an approach to future opportunities provides an opportunity for survival and further development. In the future, procurement will be diversified and turned to local sources of supply to reduce risk.

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ORGANIZATIONAL RESILIENCE: MOVING FROM CRISIS TO RESILIENCE MANAGEMENT IMPLEMENTATION

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Abstract

There is a definite shift in successful organizations of a move from the crisis management concept toward the resilience management concept, giving the organization more capabilities to deal with the imminent crisis and deal with future opportunities for growth. Given that importance and interconnection between those two topics is not well researched, we are examining the bridge concepts that connect both. For crisis management, we are looking for capabilities of anticipation of the events and need to recognize them in the early stage, where there is need for active leadership and quick actions of predefined activities. For resilience management, we are looking for best acceptable solutions and acceptance of the situation where an organization needs to reflect and learn on what has been done and feedback the learning outcomes into the process. This paper is defining the interconnecting methods that enable seamless integration of both concepts, enabling the flow or activities from crisis to resilience management.

Keywords: crisis, crisis management, resilience, organizational resilience, resilience process, resilience capabilities, resilience management, risk management.

1. INTRODUCTION

We live in very challenging world – both as individuals and organizations. Challenges to organizations are growing both in the range of problems but also in their volume. Those challenges escalate as organizational crisis and range from the economic, market, security, and cybersecurity challenges for the organization, but also challenges coming from the climate change-related events, natural disasters and industry risk related accidents (Courchi *et al.,* 2016) (Scholtens, 2008) (Laufer and Coombs, 2006). Crisis management is well known topic that is both well researched in academia but also implemented in multiple organizations.

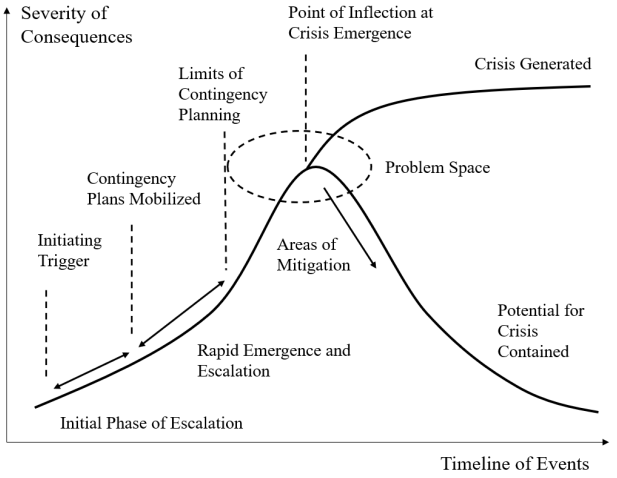
Newer research of crisis and crisis management is focused not only on their understanding but also on developing mitigation and resilience approach around them. Mitigation and resilience are used to prevent the crisis and to withstand the crisis impact (Bundy *et al.*, 2017) There is more interest in research to understand better what would make an organization resilient and why some organizations are more resilient than others. This paper aims to give an overview of the Crisis Management and Resilience concepts and how they fit together in the modern organization that deals with risk, crisis, and resilience.

2. CRISIS MANAGEMENT

Multiple organizations today implemented a first step in building the broader crisis and resiliency deployment environment: crisis management. This is a reflection to a current responsive view on what should be done if crisis occurs, and how that crisis should be managed.

The most cited definition of the crisis defines it as an "inherently abnormal, unstable and complex situation that represents a threat to the strategic objectives, reputation or existence of an organization" (British Standards Institute, 2011). Furthermore, the same international standard explains that these are unique challenges that require a different approach. However, they still can be managed appropriately, and responses prepared.

Figure 1. Crisis Emergence Model



Source: Weng, Y. K. (2009, April).

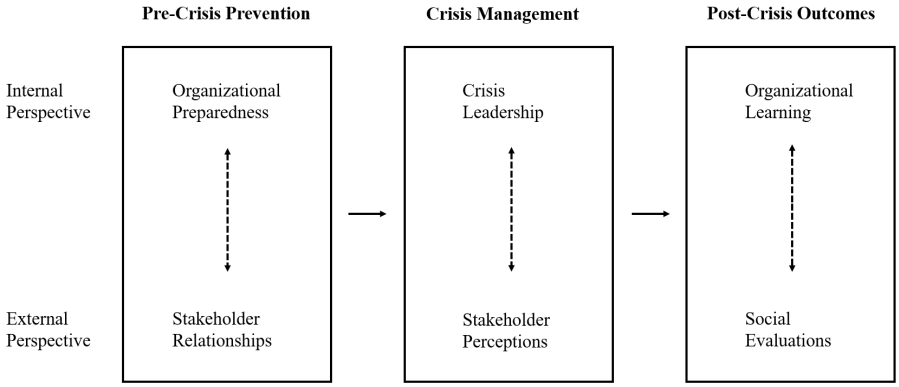
Even if the crisis management is well described in the literature and research so far, there is no clear guidance or checklist on how crisis management should be utilized, deployed or used in the specific organization – it is usually not prescriptive. Common standards and practices like ISO and BSI (British Standards Institute, 2011) agree that there are four basic principles that an organization should implement to create its approach to crisis management:

- **Intellectual Requirement Principle**: ability to analyze situations, set strategy, make decisions, and evaluate their impact.
- **Organizational Requirement Principle**: structures and processes needed to translate decisions into actions.
- **Cultural Requirement Principle**: the willingness of employees to drive and support the cultural change for activities and policies.
- **Logistic Requirement Principle**: the ability to recommend solutions with the right resources at the right time.

Apart from those four basic principles, one of the critical elements in growing crisis management understanding is understanding how the crisis management process works and how it should be evaluated.

Crisis Management process can be divided into pre-crisis prevention, crisis management at the time of the crisis, and post-crisis learning outcomes through organizational preparedness, crisis leadership, and post organizational learning.

Figure 2. Standard Crisis Management Process Model



Given the paper's focus, we will look more deeply into the Internal Perspective of Crisis Management and, later, how it is integrated into resilience.
The first part of the Crisis Management is related to the organizational preparedness: how to organize the organization for reliability and how to change organizational culture and structure (Bundy *et al.*, 2017).

Organizing for Reliability: making a necessary change in culture, design, and structure to prepare the organization for the system breakdowns that will introduce the organization to the crises. This approach would require restructuring the organization so that it can be ready for unexpected events and be connected not just to high-risk industries but also to all organizations that want to manage complexity and crisis (Weick and Sutcliffe, 2001).

Organizational culture and structure: increased impact to the organization related to the organizational culture, governance, and leadership structure. Research showed that the crisis events more impact organizations that have a higher acceptance of misconduct, lack of corporate governance structures, lack of organizational controls, etc. and in general are the generators of multiple crisis events in their own organizations (Greve *et al.*, 2017).

There is significant work needed to be performed in the organization to prepare for the crisis's impact. At the same time, regardless of time and investment, some crises will happen. The management of them is related to crisis management (dealing with the immediate impact) and resilience (dealing with the recovery).

There is a change of approach to crisis management: from the traditional approach where an organization is mandated to identify and solve the problems to more focused crisis leadership where the focus is moved to the leaders' responsibilities and capabilities to lead the organization in phases of the crisis. There is a need to introduce crisis and crisis management more to the organizational leaders so that they are better prepared for the issues of crisis framing, emotional and behavioral response to the crisis (James *et al.*, 2011).

Post-crisis outcomes are closely related to the transformation of resilience management. Post-crisis outcomes are usually organizational learning and generating new competitive opportunities (James *et al.*, 2011). Post-crisis learning should not be skipped or run through, given that he is giving the organization the potential for opportunity, renewal, and growth (Ulmer, 2001). The critical question is how quickly we can recover from the crisis stage and move to the post-crisis outcomes? How fast can we shift to the learning mode and, having the

crisis under control and activating resilient responses, start to move the organization to the next growth opportunity?

Crisis management and crisis management process are common approach where we want to protect organizational assets through simple prepare and protect, detect, and respond approach. It worked well as an element of security and protection, but it had one limitation – not to many work went into understanding of what needs to be done when event occurs and risk materializes – hence, we are not protecting, we are already defaulting the asset. That is the part of resilience research – looking on how to adapt to the risk occurred and make sure that we go back on the previous state of operation, with adapted and improved functionalities or capabilities of the system.

3. RESILIENCE MANAGEMENT

Organizational resilience has been defined as, "the maintenance of positive adjustment under challenging circumstances such that the organization emerges from those conditions strengthened and more resourceful" (Vogus and Sutcliffe, 2007, pp 3418) or "having the capacity to change before the case for change becomes desperately obvious" (Hamel and Valikgans, 2003, pp 52). Looking more deeply for the newer definitions of organizational resilience will lead to multiple streams of research leading to (Linnenluecke, 2017):

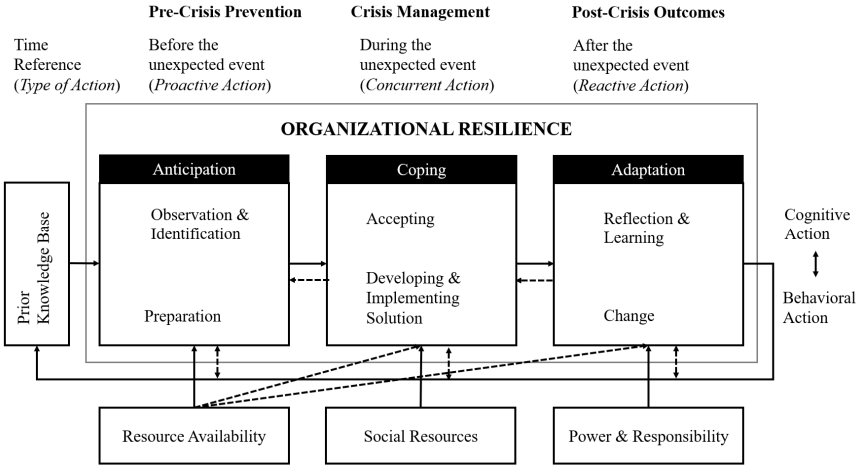
(1) organizational responses to external threats,
(2) organizational reliability,
(3) employee strengths,
(4) the adaptability of business models, or
(5) design principles that reduce vulnerabilities and disruptions.

We will look more at the organization's ability to quickly respond to the external threats, connected with the organization's ability to manage evident crisis utilizing the crisis management implementation in the organization. Multiple implementations of crisis management failed (Connell, 2011), and there was a need to look for the concept that would recognize the failure and implement feedback mechanism that will improve the crisis management concept, resilience being one of mentioned in the literature (Williams *et al*., 2017).

During times of crisis, organizations are looking to develop a resilience-based capability that will enable them to manage and rebuild after unexpected events. The change is very true for the capabilities that are core elements of resilience and the need to develop them before the crisis happens. According to the studies (Duchek, 2019), usually, there are three successive resilience stages (anticipation, coping and adaptation) of the organizational resilience capabilities, where we build organizational capabilities that deal with the crisis.

Note that understanding of the organizational resilience is still the topic of multiple research papers trying to understand resilience better, but it is still in the research what resilient organizations do and how organizational resilience should be built (Boin and van Eeten, 2013) and (Duit, 2016). Most effective resilient organizations follow the three stages defined in the process above and create an environment that not only look at the events that happen in the past (reactive) or current events (concurrent) but also to the events that potentially happen in the future (anticipatory). It is rather evident that this can be connected to the stages of crisis management approach that is already explained in the paper (pre-crisis prevention, crisis management, and post-crisis outcomes).

Figure 3. Organizational Resilience: A Capability-Based Conceptualization



Source: extended by the author with the crisis management stages

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Anticipation capabilities are related to the preventive actions related to the crisis expected where the organization adapts proactively (Oliveira Teixeira and Werther, 2013). At this stage, the organization is building anticipation capabilities to avoid the negative impact of the specific risk defined or to minimize it to the minimal reasonable effect or negative consequence (Madni and Jackson, 2009). Based on the prior studies (Duchek, 2019) resilient based organization is looking for capabilities to observe internal and external developments, create the ability to identify critical developments and potential threats, and prepare, if possible, for unexpected events. In the terminology of crisis management, this aligns with the pre-crisis prevention activities.

Coping capabilities are related to the ability to handle events that have already started effectively, either the ability to accept the problems and the ability to build and implement solutions (Jaques, 2007). Resilient organizations accept reality; they are not too confident or too cautious – frequently, they use their experiences. From that perspective, organizational resilience has three core elements: understanding the environment, defining the reference position, and accepting the system failures (Catalan and Benoit, 2011).

After accepting and understanding the failure, resilient organization executes crisis plans and develops solutions to manage the crisis. For sufficient resilience and creating the response solutions, there must be constant feedback between understanding and action – involving multiple individuals or groups that form part of the cognitive (collective) resilience (Linnenluecke, 2017). Note that in the world of new technology platforms and advancement in software as a service solution, managing the crisis could be developed and deployed during the

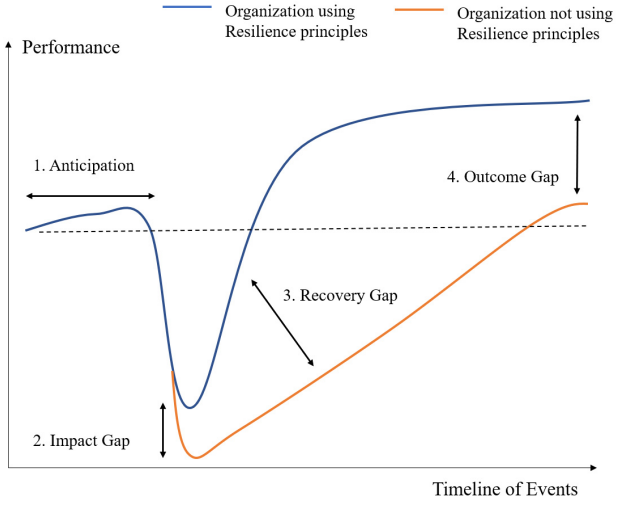
preparation phases, increasing the organizational resilience and making it just-in-time ready for a specific crisis challenges.

Adaptation capabilities relate to the resilient organization's capability to adapt to critical situations and advance utilizing reflection and learning and organizational change capabilities (Limnios *et al.*, 2014). Reflection and learning are essential steps in making sure that organizations capture learning insights into the knowledge base, act on that knowledge, and be ready to implement the change needed. Organizations utilize different techniques to enable reflection and learning like problem-solving meetings, project review sessions, informal discussions, asking questions and seeking feedback, experimenting, reflecting on results, etc. One thing common in an organization is the ability to enable interaction and collaboration between employees to learn from failures (Gressgard and Hansen, 2015). Organizational change is the output of reflection and learning – where an organization is developing new norms, values, and practices based on previously generated knowledge. Usually, for organizational change strong strategic planning process and change management process – mostly to overcome resistance to change, both on the individual, team, and organizational levels.

4. WHAT RESILIENT ORGANIZATIONS DO?

Recent reviews suggest that organizations are going through multiple changes in the way how they perceive their customers, how they organize their supply chains, recreate their operations and existing partnerships but also care about their human capital to prepare themselves for the crisis but also to answer the crisis challenge when it happens. Organizations with strong resilience principles embedded in the organization have a lower impact gap, faster recovery time, and better outcomes than those that do not have a Resilience principle as part of the organizational processes (Reeves and Whitaker, 2020).

Figure 4. Assessing Organizational Relative Resilience



Source: Reeves & Whitaker (2020).

When confronted by the unanticipated stress, an organization that employs resilience principles has multiple opportunities for the advantage that play out sequentially, and those can

give an organization a competitive edge in value over its competitors. For resilience principles, several core principles need to be applied: (1) Community Transformation Principle, changing how the organization sees it customers, (2) Digital First Principle, moving services and products to the digital channels, (3) Partnership Driven Principle, expanding the portfolio of partnerships, (4) Human Capital Principle, investing and caring about core employees, and (5) Impact on Society, understanding the broader impact that organization have on the society and environment.

The first change in organizational change implementation is confirming and solidifying an organizational relationship with the customers. Customers are treated as a community of friends; messages get personal, increased communication, empathy, care, and responsibility are in the center of messaging. In the time of crisis, the relationship is important, and boundaries that exist between organizations (sellers) and customers (buyers) should transform into joint community efforts to manage and resolve the crisis, where loyal customers and their spending are creating a resilient core business base for the organization (Yuan *et al.*, 2020) (Ntontis *et al.*, 2018).

Depending on the nature of the organization and its products, markets, sales strategies, etc. organizations are looking at the digitization of their processes and products so that they can offer them via new, digital channels and lower the cost of sales and delivery through a new approach to collaboration, digitalization, and sustainability (Cobo-Benita *et al.*, 2020). That approach also includes a remote work - by moving to digital-first, organizations in the current pandemic did not only improved the sales and delivery, they also significantly contributed to the overall healthcare activities related to social distancing to control and suspend spread of the pandemic viruses (Gardner and Matviak, 2020).

One of the early strategies that are a natural part of the organizations that have a strong ecosystem is growing the external operations and lowering the external risk by multiplying partnerships for the core operations (Zeng and Yen, 2017). Origins of the operational risk usually lack awareness and planning jurisdiction, a shortcoming of the procedures, manipulation, and failure of technology systems (Hermit and Ben Arab, 2012). By shifting the operational risks to the partnerships, the organization can extend its resilience to functional shock and issues, managing just in time to prevent events that lead to crisis and need for crisis management. This was obvious in the recent events of global pandemics when multiple delivery partners coming from China were impacted and the supply chain was non-operational due to crisis management (Fox *et al.*, 2020; Parsons, 2020).

In the time of the crisis, human capital is regarded as the most valuable organizational asset, and a number of new and extended activities and processes should be in place to protect that asset. Human capital needs strong policies on talent management to develop loyalty, employee assistance programs, motivational and psychological assistance, professional help, coaching and mentoring (Vardarlier, 2016). Another issue related to the crisis was the change of work where employees need to stay remote or have limited work options. Hybrid work models where people feel connected and deliver their work needs to be optimized to support access to the talent (human capital), keep or grow the productivity (individual and team), improve employee experience, and lower the cost of real estate. Best performing organizations implemented a different mix of scenarios from partial remote work with large HQ, partially remote work with multiple hubs to multiple micro-hubs to support a new way of work (Alexander *et al.*, 2020).

Finally, there is the perception of how society perceives the organization itself and the global and local impact those changes have on the community—during the time of crisis, expected value shifts toward the essential elements of Maslow's hierarchy of needs (McLeod,

2020). Look more at the organization's contributions to the safety and security needs (including jobs and salaries that are base for the safety net (Conley and Hsieh, 2017).

5. CONCLUSION

The overall position of the concepts reviewed is that organizations looking at the integration of crisis management and resilience will be able to sustain the risks better and manage a crisis – even changing their market position and expanding their market shares.
In a crisis, resilient organizations are looking to change multiple perspectives on how they perform, work, integrate and treat their customers, employees, and partners. There is a clear framework that drives an organization strongly to resilience:

- Need to change the relationship with the customers. They are not only customers, but they are also your partners and community – they have a different rule of engagement than standard, buying customer.
- Need to eliminate any friction between customers and the organization – depending on the service or product of use. There is a clear advantage in going to digital products, services, and delivery channels, eliminating potential risks in the channel.
- Organizations that are strongly dependent on the suppliers or supplier chains based on the regions or areas where we extrapolate most of the risks envisioned should look at the diversification of the supply base.
- Partners are still crucial for a resilient organization. More robust the partner channel that can take part in the risk will give your organization more options to choose from when crisis eventually arises.
- The human capital that your organization has is still the most important capital that you work with. Making sure that employees are protected and activated is the key element of a resilient organization.

There will be a significant shift to the integration of the crisis management concepts and resilience concept for the organizations. Resilience brings additional change and growth perspective for the organization, especially in the post-mortem or post-crisis phases. We need to prepare the organization not just for resuming the services or operations but also for looking at the new market or competitive advantage that could shift the organization to the new business reality.

Limitation of this research is that it was conducted on a hypothesis that crisis management systems are currently self-sufficient and mostly related to the protect and defend mechanisms, without broader view on how it is connected to the resilience practices. There is a possibility that many of resilience capabilities already exist within the organization, but they are part of the crisis management or other organizational practices. For further research, there is an opportunity to analyze and research specific organizations that have implemented crisis and resilience management and to understand how the resilience capabilities are implemented and how the organizations are deriving the value out of it.

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BUSINESS CONTINUITY PLANNING IN THE ATMOSPHERE OF THE COVID – 19 PANDEMIC

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Abstract

Business continuity management is a topic that is present and very current in the business world. Sometimes there is a feeling that business continuity management is like a Jeti, everyone is talking about it and no one has seen it. Interruptions in the course of business processes and operations of companies cause directly measurable financial losses to companies. In addition to these measurable losses, business interruptions can cause other losses such as a loss of credibility with clients, a market position or the company's reputation. These other losses can also have very serious consequences on the company's business. Every company must be aware of all potential risks that can interrupt the business. The company must timely prescribe procedures and work instructions that allow it to maintain the vital business functions that are necessary for the business system to maintain active status, and continue to communicate with the market. A business continuity plan is a document that consists of procedures a company needs to apply to ensure the smooth and continuous operation of all significant processes and systems. An integral component of a business continuity plan is a disaster recovery plan that contains strategies for handling unforeseen events. The disaster recovery plan determines technical and organizational measures for the re-establishment of business as soon as possible, and for mitigating the consequences of business interruptions. The purpose of a business continuity plan is to ensure that a company can survive a critical incident. The plan provides an immediate response to the crisis to shorten recovery time and mitigate its impact. The COVID-19 pandemic is a "critical incident" for the world like never before. With an unknown scope and duration, global implications, and without the possibility of accurate projections, it is fair to conclude that we are in a yet unexplored area. How does the world react to the COVID-19 pandemic? It is probably not an ideal time for management to focus on developing complex business continuity plans. However, it is important to prepare some key points of the business continuity plan because they can help a company improve its recovery time and upward trajectory.

Key words: plan, continuity, business, COVID-19.

1. INTRODUCTION

Interruptions in the course of business processes and operations of companies cause directly measurable financial losses to companies. In addition to these measurable financial losses, business interruptions can cause other losses such as a loss of credibility with clients, a market position, the company's reputation, and similar. These other losses can also have very serious consequences on the company's business.

In addition to disaster recovery planning (i.g, fires, natural disasters, etc.) business continuity management (BCM) includes any other events that may cause business interruptions (a disruption of service by suppliers, failures of computer and network systems, etc.), and have a direct impact on the course of business or cause losses to the company.

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Every company must be aware of all potential risks that can stop its business. The company must timely prescribe procedures and work instructions that allow it to retain the vital business functions that are necessary for the business system to maintain active status and continue to communicate with the market.

A business continuity plan is a document that consists of procedures a company needs to apply to ensure the smooth and continuous operation of all essential processes and systems. An integral part of the business continuity plan is a business plan in case of unforeseen events (a disaster recovery plan). It lays down technical and organizational measures for re-establishing the company's business as soon as possible or for mitigating the consequences of business interruptions (Hiles, 2007).

The business continuity plan aims to provide practical advice for employees and management on how to react in the situation of an unforeseen event and to reduce the time needed to make decisions regarding the business continuity and the establishment of ordinary business in the shortest possible time. The business continuity plan is applied at the primary location, the secondary location, and the entire organization, as well as at the backup location. The plan is made based on the analysis of business processes and it clearly and precisely determines which events can cause an emergency and business disruptions, and which events can partially or completely disable the business processes of the company, regardless of its business activity (Snedaker, 2007).

The COVID-19 pandemic is a "critical incident" for the world in general and the business world like no other incident up to date. With an unknown scope and duration, global implications, and without the possibility of accurate projections, it is fair to conclude that we are in a yet unexplored area. How does the world react to the COVID-19 pandemic? Probably, it is not an ideal time for management to focus on developing complicated business continuity plans. However, it is crucial to prepare some key points of the business continuity plan because they can help a company improve its recovery time and upward trajectory. Once companies go through the recovery phase of this COVID-19 pandemic, they can begin reviewing and updating the business continuity plan using lessons learned from the COVID-19 pandemic situation to improve their business plan, increase efficiency, and respond more effectively to future critical incidents (Đurkin-Koning, et.al. 2020).

The far-reaching economic consequences of the coronavirus pandemic in 2020 are an urgent cognitive challenge for all business organizations. The pandemic issue is an eminent political and economic issue. In this sense, the intention of this paper is to emphasize the importance of the existence of a Business Continuity Management Plan during the coronavirus pandemic.

The first part of this paper will delineate the business disruptions caused by the coronavirus pandemic. The second part explains the stages of the disorder caused by the coronavirus pandemic. The creation of a comprehensive pandemic business continuity planning as a central problem is presented in the third part of the paper.

2. BUSINESS DISRUPTIONS CAUSED BY THE COVID-19 PANDEMIC

In the last twenty years, five major public health threats: SARS, MERS, Ebola, bird flu, and swine flu, have not developed into what we see today with the appearance of the COVID-19 virus: a global pandemic that stops the normal flow of business globally and destroys the world as a whole.

We all already know how scientists predict that a new pandemic is threatening after the COVID -19 pandemic. Scientists warn that our civilization has created a "perfect storm" to spread diseases from the wild to humans and to spread diseases rapidly around the world. This view comes from global health experts who study how and where new diseases arise.

Many scientists agree that our behavior and impact on climate change, in particular deforestation and disruption of various wildlife habitats, are helping that disease is spreading more often from animals to humans. A loss of biodiversity can create landscapes that increase risky contacts between humans and wildlife and increase the chance that certain viruses, bacteria, and parasites spread to humans.[2]

That is definitely how the COVID-19 pandemic started, although currently, we are still not sure about the origin of the virus. What we do know is that a coronavirus called SAES-CoV-2 caused the COVID-19 virus. The SARS-CoV-2 virus is a beta-coronavirus, such as MERTS-CoV and SARS-CoV. All three of these viruses derive from bats. The sequences of the virus from a U.S. patient are similar to those originally released by China, suggesting the probable single, recent onset of this virus in the animal population.[3]

Regardless of its origins, the COVID-19 pandemic is an unprecedented global health crisis of our age. The COVID-19 pandemic has triggered the worst business disruptions and economic recession of this century and is causing enormous damage to human health, business, jobs, and the well-being of society. Many companies did not have plans for a pandemic situation when the COVID-19 virus began to spread or business continuity plans. Those companies that did have them unquestionably did not pay too much attention to the pandemic as a threat (they may have had a flu pandemic as a scenario). That is easy to comprehend because the reason lies in the fact that this was a hard-to-imagine scenario, not so much the COVID-19 pandemic itself, but because disturbances the COVID-19 pandemic brought. A few months ago, investing comprehensive corporate security resources in creating a comprehensive pandemic plan and implementing it did not make much sense. (Đurkin-Koning, et.al. 2020).

Unpredictable events, such as the economic recession and pandemic, are changing the direction of the work of governments, economies, and companies. The Black Death (plague) broke the long-established feudal system in Europe in the 1300s and replaced it with a more modern employment contract. Only three centuries later, the deep economic recession was a major driver of innovations that radically improved agricultural productivity. If we are going back to recent times, the 2002-2004 SARS pandemic channeled the meteoric growth of an e-commerce trading company called Ali Baba, and this pandemic helped the company to position itself at the forefront of retail in Asia. This growth was driven by fear of travel and human contact, similar to what we see today with the COVID-19 pandemic. The financial crises of 2008 also created their side effects. Airbnb and Uber have achieved greater popularity in the West, as crises have meant less in savings and lower-income for many, forcing people to rent property in the form of vacant rooms and share car rides to cover their deficits (Partio, 2017.).

In every crisis lies a potential opportunity. Early signs of a change in consumers' and companies' behavior can be observed in the situation of the COVID-19 pandemic. Some of the examples are: teleworking is encouraged in both technology (tech) and non-tech companies, airline companies' profitability is affected by low-seat occupancy, supply chains are disrupted

[2] See: SHRM/CDC Webinar: How Business, Workers and Workplaces Should Respond to COVID-19 March 10, 2020, 11:00 AM EDT

[3] See: Supply Wisdom issued an alert on January 2, 2020 as 30 cases of unidentified form of viral pneumonia had been reported in Wuhan, China.

globally, etc. Some of these changes will continue, creating a long-term digital disruption that will shape companies' business in the coming decades.

Therefore, business continuity planning after such disturbances is a "conditio sine qua non" for the survival of companies. Since the last editing of existing pandemic plans (if any), much has changed in terms of the way companies operate, including the increase in teleworking, increased use of software as a service and other cloud-based applications, and increased use of *just-in-time* production and lean production strategies in supply chains. These days companies are also much more global in terms of workers, customers, sellers, partners, and suppliers, and it is much more complex to test and implement prepared business continuity plans and pandemic plans in specific incident situations.

Some companies have advanced in their digitization capabilities in recent years. These companies will, at least in the short term, feel only a moderate impact due to the global pandemic. By moving their business to remote mode, working via online conferencing and communication tools like Zoom and Slack, companies will continue with most of their projects.

In addition to companies in the industry affected by restrictions on physical movement (hotels, airlines), the disruption in business is seen by smaller companies, which are ready for the technological change (for example, many retailers).

The biggest impact of the COVID-19 pandemic comes from the influence on people. Almost all companies are still trying to determine how they will work in the short and long term as the workforce and working communities try to function, while they struggle with what is happening in their daily lives. CHROs and CSOs across the industry are becoming a challenge, helping people and organizations with the big relocation of the workforce, such as the urgent need to move to telework to protect and empower employees, with serving customers and establishing business continuity.

The extent of the damage will depend on how quickly the COVID-19 virus spreads, the steps the authorities take to stop it, and how much economic support governments are willing to implement during the immediate impact and consequences of the COVID-19 pandemic on individual companies (Ransome & Rittinghouse, 2005).

At the sectoral level, tourism and travel-related industries will receive one of the hardest blows as authorities encourage "social distancing" and consumers remain indoors. The International Air Transport Association warns that the COVID-19 situation could cost global airlines between 63 billion and 113 billion dollars in revenue in 2020, and the international film industry could lose more than 5 billion dollars in revenue. Similarly, shares of large hotel companies have fallen sharply, and amusement parks like Disney parks are expecting a significant loss in revenue. Restaurants, sporting events, and other services will also face significant disruptions.

Industries less associated with high social interaction, such as agriculture, will be relatively less vulnerable but will continue to face challenges as demand will be declined.[4]

[4] See https://www.trt.net.tr/hrvatski/gospodarstvo/2020/07/29/zbog-koronavirusa-gubici-turizma-u-svijetu-dostigli-320-milijardi-dolara-1463821 (accessed 6 September 2020).

3. PHASES OF THE DISORDER CAUSED BY THE COVID-19 PANDEMIC

The COVID-19 pandemic caught the society and companies asleep and in some way defenseless. Many companies had to establish their rapid response plans, which initially focused on protecting employees' health and only later on business continuity.

Companies that were less dependent on supply chains and the physical presence of workers (such as a construction company) proved more resilient in this situation. Other companies suffer significantly more. All those companies that are severely or moderately affected by the COVID-19 pandemic revise their business continuity plans. They invest in the development, implementation, and maintenance of sustainable business continuity management programs, which provide companies with efficient access for performing critical and essential business functions and processes. What is most important in all this? Provide a level of protection for major goods, people, information, financial flow and reputation.

By analyzing the overall situation in the economic activity and the functioning of social communities, we can notice that the COVID-19 pandemic has three phases. The first phase is a pandemic outbreak, the second phase is a pandemic containment, and the third phase is recovery.

Also, we could conclude that once all phases are completed, from the recovery to the re-emergence of a new wave of the pandemic, we should no longer run into novel problems. However, everything should look different because of a number of preparations that have been made in the meantime and a much better understanding of the behavior and spread of the virus.

The recovery begins when governments begin to encourage companies to continue working and provide support to them. The triggers to be observed are the decline in the number of new cases of infected people in a country, the recovery of an increasing number of patients and their discharge from hospitals, and the return of business activities to a "new" normal state. Since there is a high possibility of a new wave of the pandemic, it is crucial to watch out for reproduction and inefficiency in business premises, and it is essential to set some threshold for a reaction there. As an example, it would be important to limit the physical presence in offices only to those people who are crucial for the company or to intensify the phased approach of doing business when the renewed infection subsides in some way.

For the path to recovery and ensuring business continuity, a key action that companies need to take is to form an emergency committee or business continuity committee. That committee will follow the triggers and allow for the gradual resumption of business, from one city to another city or from one country to another. The committee should focus on decision-making processes based on intelligence data with clearly defined warning indicators and an attached set of recommended actions and procedures that accompany each step if the pandemic breaks out again.

4. CREATING A COMPREHENSIVE PANDEMIC BUSINESS CONTINUITY PLANNING ILI CREATING A COMPREHENSIVE BUSINESS CONTINUITY PLANNING FOR A PANDEMIC OUTBREAK

The Covid-19 pandemic is a huge challenge for the global and European economies and the lives of citizens. During this health crisis, it is essential to protect not only the key sectors of our economy but also our assets, technology, and infrastructure in companies. (Tomić - Rotim, i Komnenić, 2017). The most important goal is to protect jobs and workers. In the event

of the pandemic, planning is based on these key principles: protecting people, stabilizing business, communicating and redesigning, and adapting to the market conditions.[5]

4.1. Protecting people

The general approach is that it is crucial to ensure the health and safety of employees in any company. People purely seek instructions for actions from their superiors and their employers. Addressing their concerns openly and transparently will involve them in the long run and reassure them of business continuity. Corporate security must quickly identify how the COVID-19 virus affects the workforce and organization and take the necessary steps to reduce potential exposure, depending on how business conditions change (Đurkin-Koning, et.al. 2020).

One of the adjustments that companies need to make is to launch or expand flexible work arrangements and other policies that allow people to work remotely safely. Depending on the sector, companies will want to reorganize their teams and reallocate resources and establish employee welfare programs and policies that support a safe work environment. Also, companies will want to maintain regular communication that is consistent with the policies of the current government and health authorities to keep employees engaged as they and the organization go through a crisis. Finding a way to redesign the ordinary business environment, which minimizes disruptions in the company, requires above all to establish a balance in all business processes and activities (Đurkin-Koning, et.al. 2020).

Where teleworking or flexible working is not possible, and companies must have workers on the site or employees need to be in direct contact with customers, it is crucial to ensure measures to protect employees and customers from the infection.

4.2. Business stabilization

Where it is possible, and per the constraint policy, it is essential to accurately assess and allocate the company's resources to maintain business activities. Most companies are experiencing significant disruptions in their ordinary business operations and face business inefficiencies throughout the COVID-19 crisis. At the beginning of the COVID-19 crisis, companies that were business-related to China had significant supply chain problems.

Later the crisis spread to Europe and the USA, and many more companies experienced disruptions, as well as significant shifts in consumer demands and behavior, affecting sectors from consumers and retail sales to manufacturing, bioscience, and the automotive industry. In solving these problems, companies should take the following actions:

- Evaluate short-term liquidity and implement cash flow monitoring discipline.
- Assess financial and operational risks and react quickly if necessary.
- Monitor direct cost escalations and their impact on overall product margins by intervening and negotiating where necessary.
- Test the stress resistance of any first- and second-order suppliers that may be under attack. That is particularly important for sectors such as the automotive and pharmaceutical industries that are heavily dependent on third-party suppliers.
- Consider setting up alternative supply chains.

4.3. Communication

[5] See: https://hrportfolio.hr/vijesti/ekonomija/epidemija-koronavirusa-najveca-prijetnja-globalnom-gospodarstvu-od-financijske-krize-59958 (accessed 9 September 2020).

Communication is imperative in the functioning of any company, especially in times of crisis and business interruptions. Clear, transparent, and timely communication is needed when creating a pandemic platform for business transformation and ensuring ongoing support by all company's stakeholders: customers, employees, suppliers, creditors, investors, and regulators. In the business of an organization, a crisis is anything that can cause sudden and serious damage to employees, its reputation or financial result. Therefore, individuals who manage organizations must think about possible crises much earlier, because the damage that occurs can jeopardize the business result and affect the entire business (Luecke, 2005). There is an interrelationship between business continuity management and crisis communication, and the overall management process is diverse and requires the integration of knowledge and experience from different areas, such as decision making, media relations, environmental studies, risk assessment, strategic planning and crisis communication. Many authors point out that communication is one of the key elements of the overall business continuity management process and can significantly determine the success or failure of an overall exit from a crisis situation (Jugo, 2017). One of the fundamental features of the crisis is forcing the organization to communicate with a range of the public to reduce the damage that business interruptions can cause, emphasizing how the quality of that communication can significantly improve or worsen the situation in which the organization finds itself (Zaremba, 2010). The moment when it is obvious that a crisis exists, that is, when it is clear that it has happened, is the most challenging and dynamic period in the cycle of crisis communication. Chronic lack of time to design and implement a response, the stress faced by individuals managing a crisis situation with the simultaneous pressure created by internal and external groups of the public involved in the situation are just some of the factors that further complicate action and communication. A special role in this phase is played by the media, which turn into an extremely sensitive communication channel during a crisis situation (Jugo, 2017).

4.4. Rethinking business models or Rethinking Business Strategy

The business plan is the main document of every company that is starting a change in the direction of its current business. It is a summary of the company's current situation, its strategic, operational, and financial plan for the future, a roadmap for the realization of these plans. Its purpose is to meet the needs of a large number of shareholders, and risk assessment is a significantly important part of the plan. The business plan focuses on all future short-term and medium-term activities in the company. It provides all employees and managers with a clear overview of the recovery strategy. It also sets out a rescue strategy for anyone who has helped the company financially. The development of a business plan follows a well-established consulting approach. The main team for the coordination usually consists of directors and members of senior management who represent engaged external associates and manages the activities of interdisciplinary subgroups, each of which is focused on a specific part of the business. In the COVID-19 crisis, it is crucial to understand holistically hyperlocal market conditions. Also, it is important to come to a unified understanding of how to determine which market priorities are particularly critical for the recovery and renewal of the company’s services (Partio, 2017).

5. THE MAIN STEPS FOR CREATING A BUSINESS CONTINUITY PLAN FOR A PANDEMIC OUTBREAK

What should companies actually do to deal with the effects of the COVID-19 pandemic or prepare for the next wave of the COVID-19 virus, or the next pandemic? Companies should

develop and implement a workplace pandemic preparedness plan along with a business continuity plan. Companies should take the following steps.

Step 1. Make an analysis of the impact of the COVID-19 pandemic

The first step is to conduct a COVID-19 impact analysis. That analysis is crucial for understanding how to help a company prepare for and recover from the COVID-19 pandemic or other similar disasters. By conducting small workshops or talking to stakeholders about a pre-designed set of questions related to critical resources, managers can identify critical roles, procedures, and assets considered to be the causes of the pandemic spread within the company.

The main question is what the critical resources in the company are. The critical resources can be grouped into four categories: (1) people, (2) locations, (3) technology, and (4) business processes - intangible resources.

The COVID-19 pandemic affects people the most, either because of a significant absence of employees from work, or because employees are infected or do not feel well, or care for dependent members of their families or do not want to come to work from fear of exposure to the COVID-19 virus. Also, there is a high indirect impact on supply chains and critical absences of contractors, which affects the provision of services on the company's premises.

The ability of any company to operate as usual is likely to be affected by the fact that the government may impose travel bans, customers may be unavailable or unwilling to meet, and employees are sent to work from their homes. It is also important to emphasize that there are double indirect impacts on people during the pandemic.

Step 2. Analyze the overall impact of the COVID-19 pandemic

In the analysis of the overall impact of the COVID-19 pandemic on the company, it is necessary to analyze a number of segments, the most important of which are:

- Public gatherings can be discouraged.
- People with flu-like symptoms (cough and fever) may not be allowed access to public places.
- Public transport may be disrupted or suspended.
- Rumors may arise, and people will want regular updates of information and clarification.
- The public health care system may be overloaded.

Step 3. Consider the impact of the COVID-19 pandemic on business

We are in a time of the pandemic, a time when the economy and companies will suffer a heavy blow. All of these will test the ability of companies to respond adequately in this situation, the readiness of companies' processes, and the overall resilience to continue with business continuity plans.[6] The effects of the COVID-19 pandemic on business are multiple, of which we single out:

- A certain percentage of employees may be absent from work during and at the height of the pandemic.
- The supply chain may be disrupted, and the demand for services may be reduced.
- The amount of business can be reduced.

[6] See: National Strategy for Pandemic Influenza Implementation Plan, Homeland Security Council, May 2006 https://www.cdc.gov/flu/pandemic-resources/pdf/pandemic-influenza-implementation.pdf (accessed 3 September 2020).

- Probable increase in electronic communication - telephone conversations, e-mail, and internet use. Communication systems and call centers can be overloaded.

In assessing the impact of the COVID-19 pandemic, it is critical to determine who core employees are that should come to work in their office daily. It is important to develop a plan on how to protect core employees from illness and to develop a plan in case of their absence due to private reasons (care for a sick family member or their quarantine). In this case, it is essential to develop a plan who can successfully replace these core employees in the conduct of critical activities.

It is crucial to focus on what the resources which may be disrupted due to the pandemic are and what the critical dependencies that the company has in the internal and external environment are. For example, for some companies, it is important to determine which the critical suppliers are and how to influence them.

One of the key elements of pandemic planning, especially in the event of a high absence rate of employees from work, it is to understand how employees' skills complement each other. By creating a skills list, we will find out which employees can support other employees if some employees are affected by the COVID-19 virus and disease.It is also important to develop record-keeping plans in case of an absence of critical managers due to illness so that it does not happen that the company has to work without leadership.

During the COVID-19 pandemic, the company's locations will be greatly affected by a number of consequences, and employees will be sent to work from home, meaning vacant locations and teleworkers increase the company's security threat and insecurity. On the other hand, if work is to continue on the company's locations, then the locations need to be prepared, and pandemic action plans need to be developed for them. These action plans must comply with government regulations, but also with the highest possible health care for employees who must be present at these locations and facilities. The reason for this is that if there are no prepared locations and infections increase or recur in the company, not only will the company lose the trust of stakeholders and the general public, but this will produce a whole number of other negative consequences for the company's reputation. When it comes to technology, every company during the crisis has experienced how crucial it is to have the right scalable technology available and how difficult that was to implement at the time of the disruptions. It is important to emphasize the fact that this allows a further flow of work without interruptions in the case of implementing a work-from-home policy.

Due to a number of the above facts, the preparation itself is very critical, which in turn implies capacity building and procedures for maintaining or restoring the availability of technology for critical business processes. A key part of any business continuity plan is a disaster recovery plan that should include application plans, data center and data room plans, testing applications and IT security response plans. Also, it should integrate a specific business continuity plan for an IT company (Tomić-Rotim and Komnenić, 2017).

Before approaching the design and conceptualization of all of the above, it is imperative to make a business impact analysis that encompasses all critical business processes, so that before a disaster like the COVID-19 pandemic, management knows what needs to be rebuilt the fastest.

The main questions that management must answer in a scope determination session are: whether they can indicate which employees are crucial and which business processes are critical for maintaining the business in the next 3 to 6 months, how long the company can be operational, or what the maximum tolerable period of disruptions before the influences become unacceptable is.

The levels of the impact of the COVID-19 pandemic on companies are covered by the following terms, or categories:

- Platinum - acceptable no more than 4 hours.
- Gold - from 4 to 48 hours.
- Silver – from 48 hours to 7 days.
- Bronze – over 7 days.

As usual, it will take a lot of time and patience for a company to get back in regular business and to function normally. The continuity of regular activities will depend on how well the company implements its pandemic recovery plan, which should ultimately include the critical dependencies that the company has in the internal and external environment.
Perhaps the most critical weakness of a company comes from its external environment because this is the weakness that we cannot effectively influence. Because companies are so dependent on suppliers in all aspects of their business, it is urgent to understand and test supplier plans in the event of a pandemic.

The development of a business continuity plan for the COVID-19 pandemic should include these four categories:

- Business site management, hygiene and social distancing.
- Travel.
- Supply chain, and
- Operations.

Once the COVID-19 epidemic is under control, companies should inevitably review and update their business continuity plans and assess how good existing business continuity plans have been. If there are shortcomings in existing plans, companies should identify the roots and causes of such weaknesses, whether it is the timeliness of action, lack of infrastructure, lack of workforce, or problems with the external environment. Based on the lessons learned, the company should consider establishing new internal guidelines as well as firm contingency plans to build resilience and better responses to future crises.

The business continuity plan during the COVID-19 pandemic can focus the company on questions when and how the company will return to normal operations and how this "new" normal operations might manifest. As there are still a lot of unknowns at the moment, this plan may also include more unforeseen events that can be reduced as the government announces various decisions and programs to fund and help the economy and other segments of society.

6. WHAT WILL THE FUTURE BRING?

The global economy is now experiencing the deepest recession since the Great Depression in the 1930s. In many countries, GDP has fallen by more than 20%, and unemployment has risen.

Even in countries where response measures have been relatively lightweight and successful, early data already clearly show that the economic and social costs of the COVID-19 pandemic will be high. The prospects for growth depend on a number of factors, including the development of the COVID-19 virus itself, the duration of the lockdown, the impact on activities, and the implementation of fiscal and monetary policy. Uncertainty is likely to be overcome over the long term. Given this uncertainty, two scenarios have been developed that reflect the possible development of the global economy. In the double-strike scenario, it is

assumed that, after another outbreak of the COVID-19 pandemic, the lockdown will be reintroduced by the end of 2020.[7]

The lockdown measures introduced by most governments have managed to slow the spread of the COVID-19 virus and reduce deaths. The introduced measures also froze business activities in many sectors, widened inequalities, disrupted education, and undermined confidence in the future. As constraints begin to ease, the path to economic recovery remains very uncertain and vulnerable to the second wave of infections.

According to the OECD report for June 2020, during high uncertainty, two scenarios are possible: one in which the COVID-19 virus continues to disappear and remain under control and one in which the second wave erupts by the end of 2020. With or without another epidemic or the second wave, the consequences of the COVID-19 pandemic will be severe and long-lasting in all sectors of society and at all levels.[8]

7. CONCLUSION

The Covid-19 pandemic has spread around the world, and everyone is trying to adapt to this ever-changing situation. Schools and workplaces have been closed, and self-isolation has become desirable, if not mandatory. Continuing business in such an environment is challenging but also absolutely necessary for the society to remain vital. The current standard way of doing business is no longer possible. We must prepare to act in the new circumstances and look forward to the direction in which organizations of all sizes and all economic sectors continue to operate. The World Health Organization (WHO) has declared the COVID-19 virus a public health threat of international proportions. The COVID-19 virus has become a human tragedy and affects governments and companies alike with unprecedented challenges and risks. That is the crisis that has profound consequences for companies around the world. From complete or partial plant closures, supply chain disruptions, layoffs of workers to cash flow problems, companies are feeling the business and financial shock from a pandemic outbreak.

In the current circumstances of the COVID-19 pandemic, it is time to focus on five key priorities that can help reshape results. These priorities are: ensuring the safety of employees and enabling their continuous engagement, changing the business continuity strategy, communicating with relevant stakeholders, maximizing the use of government support for companies, and building resilience in preparation for a "new" normal situation. The application of the requirements of ISO 22301:2019 Business Continuity Management System implies the existence of business continuity plans in emergency situations. One such emergency is the COVID-19 pandemic. In this specific situation that is happening for the first time, the authors have offered some guidelines in creating responses with an impact on business at a time of this unprecedented situation.

What consequences the COVID-19 crisis will have on the global economy is a question that economic experts have answered with different scenarios. Countries have enacted a series of measures to help national economies and preserve jobs. A major challenge for many companies was how to maintain business continuity and stability in this crisis. Given that the COVID-19 pandemic significantly affects the business, organization, and operational functionality of employees in unprecedented ways, many companies, as part of their crisis management activities, have activated crisis teams and business continuity management plans.

[7] See: CDC Coronavirus Types, CDC https://www.cdc.gov/coronavirus/types.htm (accessed 9 September 2020).
[8] See: https://data.oecd.org/gdp/real-gdp-forecast.htm (accessed 9 September 2020).

It is important to align business continuity management plans with changes: environment, management systems, processes, and organizational changes.

In this paper, the authors try to demonstrate that business continuity planning for mitigating the consequences of the COVID-19 pandemic is different from the planning needed to deal with the loss of critical infrastructure. The underlying assumptions are different, as are mitigation strategies. With this paper, the authors try to initiate a discussion on the topic of BCP business continuity planning in conditions of the COVID-19 pandemic. The paper formulates a framework for developing plans that help mitigate the effects of such disaster and identify some key questions that management must answer when preparing such a plan. Ensuring the company's survival during and immediately after the COVID-19 pandemic will mean re-establishing the organizational infrastructure needed to respond to pandemic outbreaks, then planning the company's further operations in the (potentially significant) degraded zone.

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COUNTRY RESPONSE TO COVID-19 PANDEMIC

COVID-19 AND COMMODITY FUTURES MARKETS

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Abstract

The outbreak of Covid-19 virus and its wide global spread resulted in massive socio-economic risks worldwide. Commodity market was hit harder than ever before. The paper studies the coherence between Covid-19 pandemic (measured by total cases, new cases, total deaths and new deaths) and commodity futures markets (measured by futures prices and price volatility of 26 commodities). The aim of the paper is (i) to present the general effect of Covid-19 pandemic on commodity markets, (ii) to study which commodities showed intensified effect and elaborate on reasoning and (iii) and to review which commodities and asset classes proved to be safe-havens during the pandemic crisis. The findings reveal that WTI crude oil, industrial metals and gold experienced most intensive Covid-19 effects, with oil reaching its lowest price ever and gold reaching its highest price ever. Results on price volatility and Covid-19 - commodity price correlation differ across commodities, time periods and reference Covid-19 progression measure.

Key words: Covid-19, commodity market, commodity futures prices, price volatility.

1. INTRODUCTION

Year 2020 will without a doubt be remembered as a year of Covid-19 pandemic. The outbreak of virus was first reported on December 31, 2019 in Wuhan in China. Three months later national outbreak accelerated into global pandemic. As the dissemination of virus accelerated resulting in growing number of hospitalized cases and deaths, a global lock-down was imposed. What first started as a shutdown of critical industries in major cities and hotspots, soon turned into cross-border closure, massive hysterics and general lock-down worldwide. The intensity of lock-down varied across countries. Some put restriction on movement to only essential needs, like Italy, while others advocated more liberal approach. Schools have closed, many institutions migrated to online mode, private sector enforced work from home, both private and public gatherings were banned etc. Further socio-economic implications of the Covid-19 pandemic can be found in study of Nicola et al. (2020).

Though health issues of such measures are primary concern, negative spill overs on economic activity and performance are massive and cannot be overlooked. Evidences were everywhere: in wide disruptions in global supply chains, changes in consumer purchasing behaviour, decline in consumer and business confidence, increase in risk aversion at financial markets, fall in equity prices, fall in commodity prices etc. The „new normal“ was nothing but normal. With the beginning of summer, majority of countries relaxed their measures, anticipating thus reboot of the economy. However, outlook is still rather poor. According to the projections of International Monetary Fund (IMF, 2020), global GDP will contract by 3 per cent in 2020, a larger decline than experienced during the 2008 financial crisis. It is then assumed that relaxed measures in second half of 2020 will allow global GDP to grow by 5.8 per cent in 2021, as economic activities normalise.

The focus of this paper is the impact of Covid-19 pandemic on commodity markets and commodity prices. World is experiencing a global crisis and commodity markets are affected harder than ever before. First shock can be observed through the effect on global value chains, while second one can be observed through the effect on commodity exchanges and futures trading. Since todays volume of trade exceeds the volume of production, and volume of futures trading surpasses the volume of physical trading, it can be asserted that second shock on commodity market is larger than the first one.

Today's challenges are different to those of 2008 crisis. Foremost, crude oil prices plunged below zero in April, which is for the first time. On the other hand, some commodities and asset classes proven to be safe-havens during this turbulent times. For example, the price of gold skyrocketed and reached its peak in August. This paper attempts to provide comprehensive and detailed analysis of commodity futures markets during Covid-19 pandemic. The paper reviews published studies and analyses secondary data as to give answers to following research questions:

- What is the general effect of Covid-19 pandemic on commodity markets?
- Which commodities showed intensified effect and why?
- Which commodities and asset classes proved to be safe-havens during the pandemic crisis?

The value of this paper is in raising awareness of economic implications of Covid-19. Becoming aware of Covid-19 effects on commodity prices offers both academic and practical implications. It helps investors to make their decisions regarding portfolio investments and academics to improve forecasting models.

The structure of the paper is as following. After introductory part, literature review is given. Third section provides data description and forth section outlines the analysis of commodity markets. A thorough analysis of 26 commodity futures prices is provided and includes three figures and five tables. Next, discussion of results and implications are provided. And final section gives concluding remarks regarding the commodity markets in the time of Covid-19 pandemic.

2. LITERATURE REVIEW

The appearance of Covid-19 and its undeniable effects on economy, health and social wellbeing of people, resulted in large number of studies on impact of pandemic on financial and commodity markets as well. All studies confirm statistically significant coherence of Covid-19 and market performance. However, the Covid-19 impact is not homogenous but differs in strength and direction across assets and commodities.

Since commodities are a form of asset class and commodity futures market is a part of global financial market, first effects of Covid-19 on prices of financial assets like equity and equity indexes were reviewed. According to Bloomberg, „through 1 p.m. on March 18, the S&P 500 index was off 27% for the year to date, Germany's DAX was down 38% and Japan's Nikkei was off 29%“ (Coy, 2020). The findings of study by Singh (2020) reveal that increased panic in the stock market resulting from an increased number of Covid-19 positive cases in the G-20 countries resulted in cumulative average abnormal returns. Ashraf (2020a) found that stock markets responded negatively to the growth in Covid-19 confirmed cases. That is, stock market returns declined as the number of confirmed cases increased. Further on, stock markets reacted more proactively to the growth in number of confirmed cases as compared to the growth in number of deaths. Ali et al. (2020) investigated the reaction of financial markets globally in

terms of their decline and volatility as Covid-19 epicentre moved from China to Europe and then to the US. Findings reveal that returns of most of the financial securities are negatively and significantly related to the Covid-19 deaths. On the other hand, the volatility of most of the securities is found to be positively related to the Covid-19 deaths. Study of Baek et al. (2020) also confirms that volatility is affected by specific economic indicators and is sensitive to Covid-19 news. Both negative and positive Covid-19 information is significant, though negative news is more impactful. Significant increases in total and idiosyncratic risk are observed across all industries, while changes in systematic risk vary across industry. Cepoi (2020) investigated the stock market's reaction to Covid-19 news in the top six most affected countries by the pandemic (USA, UK, Germany, France, Spain and Italy) and showed that the stock markets present asymmetric dependencies with COVID-19 related information. Both media coverage and fake news exerts a negative influence on the distribution of returns; however, their impact is not statistically significant for all quantiles. Comparable results regarding Covid-19 data and media news on equity return and volatility are found in studies of Albulescu (2020), Haroon & Rizvi (2020) and Lyócsa et al. (2020). Engelhardt et al. (2020) intended to answer a worrisome question: are stock market returns more susceptible to media news or rational expectations? Using a sample of 64 national stock markets covering 94% of the world's GDP, authors found the stock markets' decline to be mainly associated with higher news attention and less with rational expectation. They estimated the economic cost from the news hype to amount to USD 3.5 trillion for the US and USD 200 billion on average for the rest of the G8 countries.

Study of Topcu & Gulal (2020) deals with impact of pandemic on emerging stock markets. Findings reveal that the negative impact of pandemic has gradually fallen and begun to taper off by mid-April. In terms of regional classification, the impact of the outbreak has been the highest in Asian emerging markets whereas emerging markets in Europe have experienced the lowest. Authors also found that official response time and the size of stimulus package provided by the governments matter in offsetting the effects of the pandemic.

Regarding the commodity markets, Covid-19 crisis resulted in massive downturn of many commodity prices, which can be attributed to global lock-down imposed by governments worldwide (World Bank, 2020). The benefit of accurate price prediction is highly important to both investors and policymakers, especially in bear times. Academics build their knowledge based on 2008 global financial crisis experience. Studies show that inclusion of commodity assets in investment portfolios is effective risk hedging measure, thus offering higher returns especially when bear sentiment is prevailing on the market (Öztek and Öcal, 2017; Salisu et al., 2020a).

Salisu and Akanni (2020) constructed a global fear index (GFI) to capture the fear and panic created by the Covid-19 pandemic. The global fear index is calculated based on the number of reported cases and deaths worldwide, taking into consideration an incubation period of 14 days. Salisu et al. (2020b) utilized the GFI index to predict commodity prices and returns. Analysis included 24 commodities covering precious metals, industrial inputs and agriculture. Analysis of panel models shows a positive and significant relationship between GFI index and commodity price returns. These positive results coincide with findings of Chen et al. (2014) on the hedging features of commodities including metals such as gold, silver, platinum and palladium and of Tule et al. (2019) regarding hedging features of agricultural commodities such as coffee and cocoa. Studies on hedging features of commodities found that investors can effectively protect their wealth by holding and spreading their investment portfolios from traditional investment assets like stocks and bonds to more exotic ones like commodities, especially in the time of crisis. Results of Chen et al. (2014) also suggest a high predictive power of the GFI index in the predictability of commodity price returns and reveal that

commodity market offers better safe-haven properties than the stock market during the pandemic.

Majority of published studies investigated the impact of Covid-19 on oil and gold market. Sharif et al. (2020) found that the effect of the Covid-19 on the geopolitical risk is substantially higher than on the US economic uncertainty and thus impact oil price volatility. Bouri et al. (2020) found that the market uncertainty associated with infectious diseases contains valuable information for forecasting the future level of oil market volatility. Mensi et al. (2020) applied multifractal analysis in their study of crude oil and gold prices and found that the outbreak of pandemic changed the market efficiency. More precisely, gold market proved to be more inefficient during upward trends in pandemic, whereas oil market proved to be more inefficient during downward trends in pandemic. Aloui et al. (2020) assessed the impact of Covid-19 on the energy futures markets, particularly on crude oil and natural gas S&P GS Indexes. The findings confirm that energy commodities S&P GS Indexes responses to Covid-19 shock vary over time due to fundamentals factors as well as behavioural and psychological factors. Among fundamentals structural imbalance between supply and demand has the strongest impact, particularly a strong decrease in energy demand in large emerging countries such as China and an oil shock caused by disagreements between OPEC and Russia. In addition, the spread of the virus in the USA impacted negatively the commodity futures market. During the crisis, speculators turned to the commodity markets to increase their returns which lead to a slight increase in commodity futures index during stock market crash. The findings of Meher et al. (2020) reveal that there is a presence of leverage effect of Covid-19 on the price volatility of crude oil. However, this leverage effect is not present on the price volatility of natural gas.

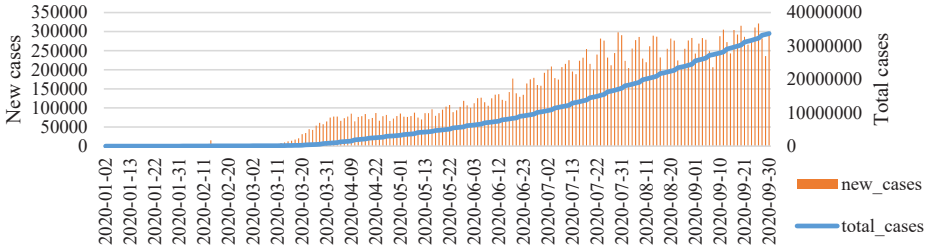
A number of studies examined the safe-haven features of cryptocurrencies and its hedging capabilities during the Covid-19 pandemic (Conlon et al., 2020; Demir et al., 2020; Yarovaya et al., 2020; Corbet et al., 2021). However, findings show that not all cryptocurrencies uniformly show hedging capabilities, but they differ across cryptocurrency types and equity indexes. Ji et al. (2020) re-evaluated the safe-haven role of some traditional asset types, namely gold, cryptocurrency, foreign exchange and commodities. The main results show that the role of safe haven becomes less effective for most of the assets considered, while gold and soybean commodity futures remain robust as safe-haven assets during this pandemic.

Crisis changes relations within markets, as well as between. Even though Covid-19 crisis cannot be directly compared to 2008 financial crisis, since the two differ in their origin, scope and dynamics, insights can be taken and build upon. Zhang and Broadstock (2019) documented a dramatic change in connectedness in global commodity prices following the 2008 global financial crisis. Results show that co-dependence in price movements among seven major commodity classes increased from average of 14.82% in the period before crisis to an average of 47.87% in the period following the crisis. Wang et al. (2020) examined the influence of Covid-19 on the cross-correlations of multifractality between crude oil and agricultural futures. In general, Covid-19 has a great impact on the cross-correlation of multifractal property between crude oil and most selected agricultural future markets. Results of Salisu et al. (2020c) showed that both oil and stock markets may experience greater initial and prolonged impacts of own and cross shocks during the pandemic than the period before it. Lahmiri & Bekiros (2020) found that the S&P500 market volatility became connected to volatility in energy markets and volatility in Bitcoin during the pandemic, and that the volatility in precious metals is less connected to volatility in energy markets and to volatility in Bitcoin market during the pandemic. Such results offer valuable implications regarding diversification of investment portfolio.

3. DATA

Analysis is performed on secondary data on commodity prices and Covid-19 data. Commodity prices refer to closing prices of commodity future contracts and are retrieved from webpage Investing.com. Analysis included 26 commodities ranging over all commodity categories traded on the exchange: Aluminium, Brent crude oil, Cocoa, Coffee, Copper, Corn, Cotton, WTI crude oil, Feeder cattle, Gold, Lead, Lean hogs, Live cattle, Lumber, Natural gas, Nickel, Oats, Orange juice, Palladium, Platinum, Rough rice, Silver, Soybeans, Tin, Wheat and Zinc. Covid-19 data are represented by total cases, new cases, total deaths and new deaths and are retrieved from webpage Ourworldindata.org. All data is measured on a daily basis. Analysed time period ranged from January 01, 2020 to September 30,2020. Non-working days, when markets are not active, are excluded from the analysis. Commodity prices reflect prices of commodity futures traded at US exchanges since they stand for leading trading venues worldwide and realized prices show global impact. Likewise, Covid-19 data include world data.

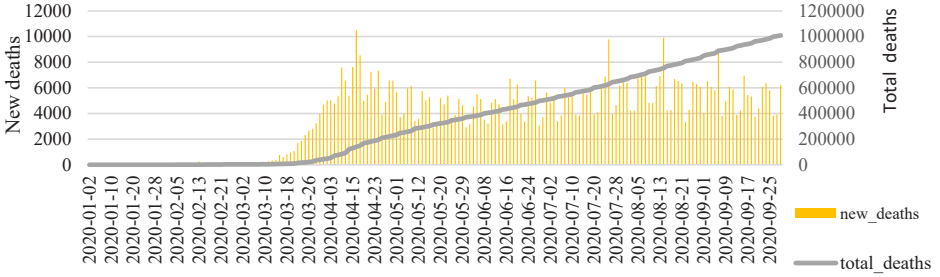
Figure 1. Total number of Covid-19 cases and number of new Covid-19 cases, by day (01/01/2020 – 09/30/2020)



Source: Represented by author. Data retrieved from Our World in Data: Coronavirus (COVID-19) Cases. Available at: https://ourworldindata.org/covid-cases (accessed 14 October 2020).

Figure 1 shows daily distribution of total and new Covid-19 cases worldwide in first three quarters of 2020. Figure 2 shows daily distribution of total and new deaths worldwide associated with Covid-19 in the same period. It can be seen that both number of Covid-19 cases and associated deaths start to increase sharply in mid-March, followed by global lock-down.

Figure 2. Total number of deaths due to Covid-19 and number of new deaths due to Covid-19, by day (01/01/2020 – 09/30/2020)



Source: Represented by author. Data retrieved from Our World in Data: Coronavirus (COVID-19) Cases. Available at: https://ourworldindata.org/covid-cases (accessed 14 October 2020).

Next, historical prices of 26 commodity futures were analysed. Table 1 gives summary statistics of price analysis. As highly volatile, prices of Brent crude oil (26.33%), WTI crude oil (33.01%), Lumber (36.40%) and Silver (24.09%) have revealed, measured by standard

deviation relative to mean, implying thus intensified effect of Covid-19 crisis. The least volatile proved to be prices of Aluminium (6.89%), Corn (6.29%), Lead (6.14%), Soybeans (5.43%) and Wheat (4.55%), implying thus low susceptibility to economic turmoil caused by Covid-19 pandemic. Further on, it is important to note that WTI crude oil reached its all-time low, a negative price of minus 37.63 US dollars per barrel on April 20, 2020. Likewise, gold reached its all-time high of 2069.40 US dollars per ounce on August 4, 2020.

Table 1. Summary statistics of commodity futures prices (01/01/2020 – 09/30/2020)

Variable	Min	Max	Mean	Std. Dev.	Rel. Std. Dev.	Quotation unit
Aluminium	1426.5	1826	1651.908	113.7843	6.89	US dollars/ton
Brent_crude_oil	19.33	65.44	41.98674	11.05474	26.33	US dollars/barrel
Cocoa	2160	2988	2496.942	203.9241	8.17	US dollars/ton
Coffee	93.65	134.8	110.1289	9.896818	8.99	US dollars/ton
Copper	2.1	3.023	2.685742	0.2402466	8.95	US dollars/pound
Corn	302.75	387	337.4678	21.22345	6.29	US cents/bushel
Cotton	48.85	71.43	61.91995	5.341374	8.63	US dollars/pound
WTI_crude_oil	-37.63	62.7	38.18679	12.60488	33.01	US dollars/barrel
Feeder_cattle	108.25	147.6	133.7157	9.670539	7.23	US cents/pound
Gold	1487.1	2069.4	1765.159	140.4918	7.96	US dollars/ounce
Lead	1598.25	2003.5	1809.753	111.0379	6.14	US dollars/ton
Lean_hogs	37.33	72.8	56.94305	8.520445	14.96	US cents/pound
Live_cattle	83825	127425	104098.7	11128.59	10.69	US cents/pound
Lumber	259.8	984.5	473.5426	172.3838	36.40	US dollars/board feet
Natural_gas	1482	2657	1911.711	267.21	13.98	US dollars/MMBtu
Nickel	10930	15705	13145.41	1109.157	8.44	US dollars/ton
Oats	253.5	345.5	293.4778	23.14965	7.89	US dollars/bushel
Orange_juice	93.5	129.4	112.4078	10.91696	9.71	US cents/pound
Palladium	1483.3	2781.2	2095.202	231.4333	11.05	US dollars/ounce
Platinum	595.2	1026.35	852.3371	84.25723	9.89	US dollars/ounce
Rough_rice	11385	22065	14013.61	1984.986	14.16	US cents/hundredweights
Silver	11805	29261	19740.46	4755.016	24.09	US dollars/ounce
Soybeans	824.62	1043.38	887.2258	48.2104	5.43	US cents/bushel
Tin	13165	18342.5	16542.08	1204.402	7.28	US dollars/ton
Wheat	473.62	579.62	525.9473	23.94266	4.55	US cents/bushel
Zinc	1815	2552	2156.684	210.3702	9.75	US dollars/ton

Source: Calculated by author. Data retrieved from Investing.com: Real Time Commodity Futures Prices. Available at: https://www.investing.com/commodities/real-time-futures (accessed 13 October 2020).

4. ANALYSIS OF COMMODITY MARKET DATA RELATIVE TO COVID-19 PANDEMIC

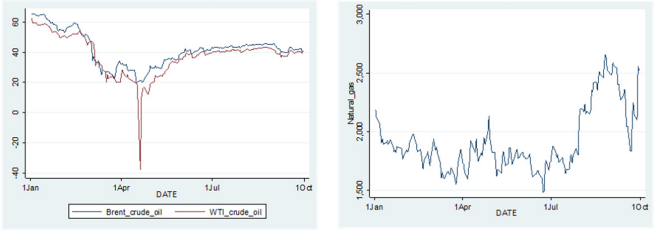
Figure 3 comprises 17 panels that show historical prices of 26 commodity futures. Related commodities that are quoted in the same price units are shown on the same graph. A general downward trend can be observable in first quarter of 2020 which can be attributable to Covid-19 pandemic. However, exceptions exist.

Looking at the energy commodity class, it is quite noticeable that WTI crude oil experienced the largest drop in price. A historic drop occurred on April 20, when the price of WTI crude dropped by almost 300%, trading at around negative USD 37 per barrel. The major role in negative price can be attributed to fall in demand for oil caused by the Covid-19 pandemic and to a price war that erupted between oil giants Saudi Arabia and Russia (Bildirici et al., 2020). Supply remained steady whereas demand sharply decreased, and the industry

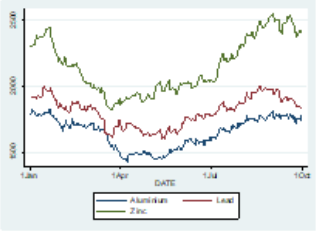
quickly began running out of storage space for oil. The reaction of long investors of WTI futures who are expected to take physical possession of the oil when the contract expires, was to sell to take the contract off their hands, prompting an unprecedented price crash. In May, the oil market starts to recover, as a result of economy re-opening and production decrease. It can be seen that Brent crude oil followed the price pattern of WTI crude oil, with the exception of negative price in April. The reasoning for Brent not sinking into negative prices can be explained by availability and cost of storage facilities. Since Brent crude oil is drilled in wells situated in North Sea, it was possible to store oil n floating storages and sell it later at reasonable price. WTI crude oil, on the other hand, is drilled and stored on land, so it faces limited storage capacities. Recovery is on horizon. International Monetary Fund projects that average crude will be USD 37/barrel in 2020 and 40/barrel in 2021 (IMF, 2020). Natural gas did not show such strong reactions to pandemic, even though first quarter was characterized by downward trend, followed by price recovery with the beginning of summer.

All industrial metals show the same general pandemic effect: price drop in first quarter and price recovery since June. All industrial metals recovered to their beginning-of-the-year prices until Fall, while prices of Copper, Aluminium and Tin grew considerably above that level. Looking at the precious metals market, one can observe that only Gold opposed to general negative effect in first quarter. The short drop was inevitable in mid-March, but the magnitude and continuance were far from the general effect on commodity markets. All through the year, Gold showed steady upward trend reflecting thus its safe-haven possibilities in the period of economic turmoil. It reached its highest price ever on August 4. Palladium and Silver showed momentous fall in first quarter, but recovered through the year. Silver showed isolated behaviour among precious metals since its price strikingly grew in third quarter offering thus abundant return for investors that chose to invest in Silver. For comparison, Gold that is often praised as smart investment, failed to show so impressive results in terms of rate of return. Gold is till trading over Platinum, a relation that was restored in 2008, which implies the nature of market sentiment. The price differential between two precious metals represents the supply and demand and economic issues that affect the two metals independently, including Platinum's importance in the automobile industry and Gold's status as a safe-haven during economic downturns.

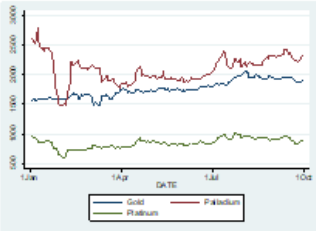
Figure 3. Historical prices of commodity futures (01/01/2020 – 09/30/2020), 17 panels

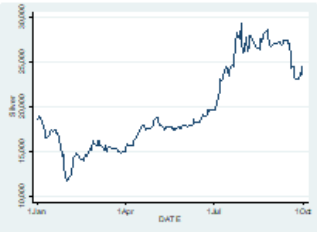



Copper
DATE


DATE
Aluminium
Lead
Zinc


DATE
Nickel
Tin

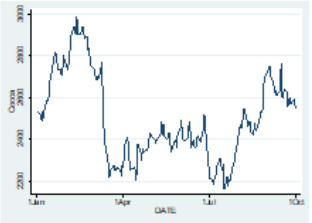

DATE
Gold
Palladium
Platinum


Silver
DATE

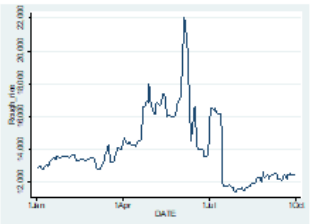

Lumber
DATE

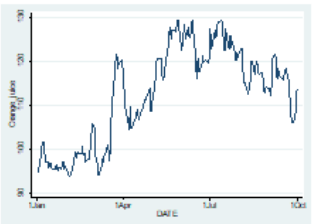

DATE
Feeder_cattle
Lean_hogs


Live_cattle
DATE


Cocoa
DATE


Coffee
DATE


Rough_rice
DATE


Orange_juice
DATE

Source: Represented by author. Price quotation units listed in Table 1.

Regarding the softs market, Lumber showed minor fall in first quarter, followed by multiple rise in second and third quarter that can be explained by increase in demand for housing. Rising prices of lumber also reflect rising costs of labour, transport and containers and will trigger rising interest rates. Looking at cattle prices, Lean hogs and Feeder Cattle show comparable pattern. One can observe lagged negative Covid-19 effect compared to other commodities which can be explained by use of agricultural commodities as input in livestock breeding. Prices were recovered in third quarter. On the other hand, Live cattle is still striving to reach prices at their beginning-of-the-year level.

Grains showed general negative effect in first quarter and managed to recover by third quarter. Even though they were quite volatile during the year, they did not show any atypical price values. For the comparison, oilseeds lead by Soybeans showed a lot quicker, persistent and notable price increase during recovery. Cocoa, Coffee and Rough rice encountered volatility that is hard to attribute to Covid-19 pandemic. Deeper insight will be provided by further correlation analysis. Orange juice seems not to be hit by Covid-19 pandemic in the first quarter, yet its price continues to rise in second and third quarter. However, high prices can be attributed to low availability in the market due to low yield and crush of large-sized processors, and not by Covid-19 pandemic. Cotton on the other hand, shows high exposure to Covid-19 pandemic with massive drop in first quarter and steady recovery since which can be accounted by pandemic related mill closures.

Table 2 shows average daily percentage change in price of commodity futures, for total period analysed and for each month separately. Bold values represent the most volatile month for each commodity measured by average daily percentage change. Out of Covid-19 data, new cases and new deaths show highest volatility. Cells in red mark negative average price changes. Cells in green mark positive average price changes. Out of commodities with positive average daily price changes through all analysed period, Lumber, Natural gas, Lean hogs and Gold show highest average daily price increase. Out of commodities with negative average daily price changes through all analysed period, WTI crude oil, Brent crude oil and Cotton show largest average daily price decrease.

Table 2. Average daily percentage change in price of commodity futures

	January – September	January	February	March	April	May	June	July	August	September
total_cases_ch	4.76956	**22.51966**	8.019461	7.652895	4.705662	2.100298	1.779105	1.713756	1.228003	.9554528
new_cases_ch	11.3466	**73.84121**	40.73178	19.16884	5.592537	7.512665	5.419382	7.249288	6.333071	4.611443
total_deaths_ch	5.492973	**45.47908**	8.703296	8.700675	6.411073	1.686945	1.130498	.9751822	.8287217	.5974315
new_deaths_ch	13.86174	**18.56834**	3.534419	12.9256	14.51581	14.48571	17.58083	16.39169	16.99539	11.91757
Aluminium_ch	.1814495	.0263796	.3837198	-.4420079	.2893247	.1259391	**.5215092**	.4940142	.2816226	.0015365
Brent_crude_oil_ch	-.1749781	-.8511866	-.3335193	-1.517382	-1.105245	**1.801772**	.3100469	.147639	.0809803	-.3118555
Cocoa_ch	-.0554858	.3404369	-.0430312	**-1.091247**	.5253737	-.1177322	.0690262	-.0856256	.5932232	-.3190541
Coffee_ch	.1292914	-1.116136	.9727309	-.6070984	-.4869803	-.4977618	.1617681	**1.254995**	.5936785	-.3021407
Copper_ch	.0601752	-.6491638	.1122163	-.3412407	.2440982	**.7620398**	.5226707	-.3432949	-.0735422	.2913131
Corn_ch	-.0257646	-.3838361	**-.4823715**	-.4002214	.2788913	.08474	-.1136988	-.4042233	.605223	.4699514
Cotton_ch	-.1205449	-.3047419	-.3238294	**-1.569815**	1.056337	.1259444	.0566164	.1690551	-.1162199	-.1472005
WTI_crude_oil_ch	-.3136553	-1.245951	-.4306185	**-4.717703**	-.5066031	3.601167	.4412868	.0923323	.0241166	.0085991
Feeder_cattle_ch	-.0055191	-.4243013	-.2453577	-.6916656	.1706864	**.7401282**	.0427416	.4700206	-.1553134	-.0513041
Gold_ch	.187873	-.0951543	.2866098	**.7049434**	.138308	-.046014	.3822658	.4341072	-.1738771	-.0784683
Lead_ch	-.0912564	.0972635	.1530714	-.1205599	-.4703911	-.3439407	.3541322	-.03809	.2933919	**-.5228262**
Lean_hogs_ch	.2502328	-1.254822	.5696734	-1.458999	1.176139	.6448882	-.7706255	.8608997	.2186978	**1.954625**
Live_cattle_ch	-.0395608	-.2675014	-.4939791	-.4667221	-.5057365	**.5959829**	-.0687137	.5143309	.0209097	.1367445
Lumber_ch	.4875208	.3220658	-.2625202	-1.659532	1.762628	.9629298	.4248332	1.631284	**2.665687**	-1.910451
Natural_gas_ch	.2491264	-.8534172	-.5730026	-.5438048	.4725924	-.6706447	.0979552	**1.227864**	1.051436	1.05302
Nickel_ch	-.0666848	**-.4868406**	-.283241	-.0481596	.0111248	-.1333723	-.0119691	.0686776	.4840474	-.3381687
Oats_ch	-.0607805	.0827324	-.8515194	-.0507096	.8186294	.4625312	.2638308	**-.9689351**	-.446237	.4504376
Orange_juice_ch	.0865991	-.1304529	.4669722	.1638925	**-.6860974**	.6845459	.0884825	.2094108	-.2253303	.0514251
Palladium_ch	-.012477	**-1.574695**	1.455664	-1.140369	.2845086	-.2959106	.0364363	.1662899	.3720561	.0709914
Platinum_ch	.1264297	**-2.25524**	1.394385	-.035128	.6160298	.083841	.0476843	.3996969	-.2549509	-.1001208
Rough_rice_ch	.077028	.2269009	-.1094759	.1101099	1.293004	.7552005	**-1.332266**	-.5185333	.268005	.1104944
Silver_ch	.1416329	**-1.938905**	1.187688	-.2669716	1.020729	-.0964977	.5424395	1.031585	-.0649791	-.9919631
Soybeans_ch	.1293703	-.0409557	.0335444	-.1368359	.1541785	.1080381	.0191001	-.1079568	.579324	**.6453299**
Tin_ch	-.0720181	-.1145119	-.0460284	**-.3888822**	-.2557943	-.0716026	.327544	.0887925	.1271705	-.3812714
Wheat_ch	-.0381645	-.3960148	.0482137	**-.614146**	.0466685	-.0912855	.3296082	-.4238706	.6135644	.0195603
Zinc_ch	-.0644295	-.0826769	-.2696498	-.1080982	-.096348	-.0228381	-.1641829	**.3910891**	.3457599	-.3215857

Source: Calculated by author. Bold values represent the most volatile month measured by average daily percentage change. Cells in red mark negative average price changes. Cells in green mark positive average price changes.

Analysed by month (Table 2), it is observable that March and May stand as two most volatile months for majority of commodities: March with its generally negative movement (with the exception of Gold and Orange juice) due to global lock-down and May with its generally positive movement (with the exception of Cocoa, Coffee, Gold, Lead, Natural gas, Nickel, Palladium, Silver, Tin, Wheat and Zinc) due to economy reopening. It can be stated that negative effect of lock-down was much more widespread than positive effect of economy reopening.

Table 3 provides correlation coefficients between Covid-19 data and commodity future prices for the whole analysed period January, 01 through September, 30. It can be seen that total cases correlate most strongly with majority of commodities, mostly positive, followed by new deaths that show mostly negative correlation.

Table 3. Correlation between Covid-19 cases, Covid-19 deaths and commodity futures prices (01/01/2020 – 09/30/2020)

	total_cases	new_cases	total_deaths	new_deaths
total_cases	1.0000			
new_cases	0.9325	1.0000		
total_deaths	0.9743	0.9678	1.0000	
new_deaths	0.5677	0.7477	0.6648	1.0000
Aluminium	**0.4233**	0.2378	0.2927	-0.3033
Brent_crude_oil	0.0114	-0.1038	-0.0534	**-0.4793**
Cocoa	-0.0503	-0.2937	-0.1823	**-0.5510**
Coffee	**0.3093**	0.1859	0.1803	0.1059
Copper	0.6314	0.6003	**0.6636**	0.1725
Corn	0.2073	-0.0320	0.0934	**-0.3483**
Cotton	0.2219	0.0451	0.1316	**-0.4124**
WTI_crude_oil	0.0792	-0.0373	0.0143	**-0.4507**
Feeder_cat~e	**0.4826**	0.3935	0.4437	-0.0802
Gold	0.8643	**0.9361**	0.9109	0.7400
Lead	**0.4666**	0.3283	0.3661	-0.1433
Lean_hogs	0.0228	-0.2216	-0.1006	**-0.4779**
Live_cattle	-0.0868	-0.2787	-0.2197	**-0.6336**
Lumber	**0.8332**	0.7322	0.7771	0.3251
Natural_gas	**0.7040**	0.5639	0.6239	0.3035
Nickel	**0.7806**	0.6439	0.7187	0.1808
Oats	**-0.2648**	-0.1662	-0.1257	-0.0318
Orange_juice	0.4403	0.6376	0.6000	**0.6823**
Palladium	**0.4271**	0.3323	0.3682	0.0252
Platinum	0.6252	**0.7100**	0.6841	0.5869
Rough_rice	**-0.3976**	-0.2922	-0.2624	0.0808
Silver	0.8899	**0.9154**	0.9099	0.6200
Soybeans	**0.8469**	0.6782	0.7602	0.2384
Tin	**0.6507**	0.5656	0.6189	0.0922
Wheat	0.1845	-0.0043	0.0374	**-0.3107**
Zinc	**0.6972**	0.5415	0.6052	0.0707

Source: Calculated by author. Values in bold represent the strongest correlation pair between commodity futures price on one side and alternative Covid-19 measures on the other side.

Gold shows highest correlation with all four measures of Covid-19 pandemic, whereas WTI crude oil generally shows weak correlation with Covid-19 data with exception of strong negative correlation with new deaths. It can be argued that Covid-19 effect on Gold is

observable in steady price rise whereas effect on WTI crude oil is observable in temporary price shock. Some of the results might be misguiding, since cause-and-effect relationship cannot be verified based on the correlation coefficient. The said holds especially for those commodities that show highest correlation with total Covid-19 data that accumulate over time. However, data on total cases and total deaths cannot be simply omitted from the analysis since they contribute to massive hysterics and fear associated with Covid-19 pandemic. Recommendation for future studies is to conduct time series analysis of Covid-19 data on commodity futures prices with time as control variable.

In order to investigate the coherence between Covid-19 and commodity markets more closely, a correlation analysis between Covid-19 data and commodity future prices is performed isolated for the first quarter (Table 4) and month of March (Table 5). Results of isolated correlation analysis for first quarter show rather similar results as correlation analysis for the whole period, with intensified and same directional correlation. Exceptions are Coffee, Oats, Orange juice and Silver that found higher correlation with other Covid-19 data.

Table 4. Correlation between Covid-19 cases, Covid-19 deaths and commodity futures prices for first quarter

	total_cases	new_cases	total_deaths	new_deaths
total_cases	1.0000			
new_cases	0.9633	1.0000		
total_deaths	0.9934	0.9751	1.0000	
new_deaths	0.5072	0.6836	0.5750	1.0000
Aluminium	**0.4818**	0.2975	0.4082	-0.3963
Brent_crude_oil	0.0124	-0.1786	-0.0790	**-0.7606**
Cocoa	-0.2615	-0.4288	-0.3358	**-0.8121**
Coffee	0.4942	**0.5400**	0.4898	0.4907
Copper	**0.7610**	0.6044	0.7070	-0.0761
Corn	-0.0539	-0.2217	-0.1273	**-0.5830**
Cotton	0.1480	-0.0565	0.0717	**-0.6551**
WTI_crude_oil	0.1057	-0.0647	0.0155	**-0.6010**
Feeder_cattle	**0.5543**	0.3820	0.4917	-0.3053
Gold	0.9345	**0.9572**	0.9477	0.6289
Lead	**0.6624**	0.5000	0.5855	-0.1928
Lean_hogs	-0.1554	-0.3350	-0.2087	**-0.7287**
Live_cattle	-0.0998	-0.2886	-0.1857	-0.7645
Lumber	**0.9173**	0.8067	0.8736	0.2055
Natural_gas	**0.9017**	0.8277	0.8872	0.3633
Nickel	**0.8259**	0.6885	0.7853	0.0511
Oats	-0.6550	**-0.6754**	-0.6261	-0.4146
Orange_juice	0.7782	**0.8561**	0.8242	0.7742
Palladium	**0.3923**	0.3163	0.3745	0.0075
Platinum	0.7056	**0.7527**	0.7515	0.6414
Rough_rice	**-0.6283**	-0.5208	-0.5558	0.0946
Silver	0.9689	0.9529	**0.9763**	0.5555
Soybeans	**0.7607**	0.6433	0.7105	0.1062
Tin	**0.7077**	0.5529	0.6563	-0.1401
Wheat	-0.1452	-0.2816	-0.2195	**-0.5407**
Zinc	**0.7913**	0.6493	0.7363	-0.0177

Source: Calculated by author. Values in bold represent the strongest correlation pair between commodity futures price on one side and alternative Covid-19 measures on the other side.

Table 5. Correlation between Covid-19 cases, Covid-19 deaths and commodity futures prices for March

	total_cases	new_cases	total_deaths	new_deaths
total_cases	1.0000			
new_cases	0.9644	1.0000		
total_deaths	0.9985	0.9496	1.0000	
new_deaths	0.9920	0.9806	0.9861	1.0000
Aluminium	-0.9114	**-0.9480**	-0.8930	-0.9309
Brent_crude_oil	-0.2117	**-0.3564**	-0.1735	-0.2799
Cocoa	-0.6806	**-0.7616**	-0.6549	-0.7181
Coffee	0.4774	**0.5631**	0.4535	0.4964
Copper	-0.7240	**-0.8187**	-0.6941	-0.7597
Corn	-0.7238	**-0.7912**	-0.7006	-0.7695
Cotton	-0.8724	**-0.9344**	-0.8520	-0.9015
WTI_crude_oil	-0.6793	**-0.7425**	-0.6556	-0.7083
Feeder_cattle	-0.2461	-0.1621	**-0.2582**	-0.2426
Gold	0.7055	0.7155	0.7002	**0.7218**
Lead	-0.4767	**-0.6094**	-0.4384	-0.5213
Lean_hogs	-0.7359	-0.6386	**-0.7510**	-0.7176
Live_cattle	-0.2481	-0.1700	**-0.2589**	-0.2455
Lumber	-0.7919	**-0.8029**	-0.7787	-0.8024
Natural_gas	-0.0543	**-0.1878**	-0.0195	-0.1264
Nickel	-0.7087	**-0.8052**	-0.6790	-0.7504
Oats	-0.2796	-0.2848	-0.2755	**-0.3016**
Orange_juice	0.8728	**0.9317**	0.8518	0.8978
Palladium	-0.8126	**-0.8362**	-0.7996	-0.8284
Platinum	-0.1168	-0.0704	**-0.1311**	-0.1180
Rough_rice	0.6444	0.6541	0.6347	**0.6597**
Silver	-0.6897	**-0.7627**	-0.6669	-0.7231
Soybeans	-0.6669	**-0.7712**	-0.6364	-0.7045
Tin	-0.6103	**-0.7266**	-0.5775	-0.6532
Wheat	-0.8198	**-0.8359**	-0.8106	-0.8325
Zinc	-0.6235	**-0.7395**	-0.5890 -	0.6638

Source: Calculated by author. Values in bold represent the strongest correlation pair between commodity futures price on one side and alternative Covid-19 measures on the other side.

When isolating correlation between Covid-19 and commodity markets only in month of March, the true magnitude of Covid-19 crisis can be observed. Vast majority of commodities show negative correlation with Covid-19 progression, exception being Gold, Coffee and Rough rice. As dominant measure of Covid-19 progress with strongest correlation with commodity futures prices, new cases now appear, followed by total deaths and new deaths. Such results are also more reliable since the troubled interference of time progression is out of the focus. The strongest negative correlation is shown by Aluminium, Cotton, Orange juice, Copper, Wheat and Palladium, revealing thus major defeated markets and industries. The strongest positive correlation is shown by Gold, revealing thus major benefited markets and industries. On the other hand, weak correlation (positive or negative) is shown by Feeder cattle, Live cattle, Natural gas, Oats and Platinum implying thus potential portfolio diversification possibilities.

5. DISCUSSION AND IMPLICATIONS

Empirical findings show that not all commodities experience same volatility during Covid-19 pandemic. Among 26 analysed commodities, following showed low volatility measured by average daily percentage change: Cocoa, Coffee, Feeder cattle, Live cattle, Nickel, Oats, Orange juice, Palladium, Rough rice, Wheat, Tin and Zinc (Table 2). Such results imply high resistance of this commodity futures to risk and uncertainty. Intense and immediate negative effect on price was experienced by WTI crude oil, Palladium, Cotton, Wheat, Soybeans, Lumber and industrial metals like Aluminium, Copper, Nickel and Zinc (Table 5). However, Wheat managed to quickly recover its price, which can be thanked to being staple food ingredient. Low correlation with Covid-19 progression was showed by Feeder Cattle, Live Cattle, Natural Gas and Wheat, whereas high positive correlation was shown by Gold (Table 5). Such results offer important implications as they imply investment decisions relative to risk aversion and hedging capabilities of commodities that show low correlation to Covid-19 pandemic. Some commodities, like Gold, continued to increase their price irrelevant of economic turmoil which only confirms their safe-have capabilities.

Hedging characteristics become more relevant during crisis. Results of Salisu et al. (2020a) support findings of previous empirical studies that investing in commodities, especially during crisis and turbulent periods, serves as a good hedge against the volatility and declines in stock markets. Several factors characterize the desirable features of commodities, particularly gold and other precious metals, and these include: (i) the intrinsic value of most commodities neither depends on prospective cash flows nor carries a default risk; (ii) precious metals are universally acceptable and scarce; (iii) most commodities have relative supply inelasticity and their observed counter-cyclical demand characteristics make them store of value; (iv) their protection attributes and properties are commonly referred to by many investors, individuals and the media (Arnold and Auer, 2015).

The economic recession puts downward pressure on prices, especially for high-value added commodities. Recent price movements will have twofold counteracting effect on food demand. Lower economic growth tends to reduce food demand; whereas lower commodity prices tend to increase demand. The overall outcome will differ among agricultural products and countries. The consumption of staple foods like rice and wheat, are considered to be less affected by the pandemic. Whereas, the consumption of higher value commodities such as vegetable oil and meat is projected to decline more substantially (Gay et al., 2020). Elleby et al. (2020) further allege that the most affected commodities will be biofuels and to some extent the feedstock (e.g. maize in the US and rapeseed in Europe) since demand for these commodities is strongly linked to the demand for transport fuel, but it is also sensitive to changes in the oil price, which affects their competitiveness.

Even though general opinion prevails that governmental measures of social distancing have negative economic effect, study of Ashraf (2020b) shows that announcements of government social distancing measures have a direct negative effect on stock market returns due to their adverse effect on economic activity, while an indirect positive effect through the reduction in COVID-19 confirmed cases. On the other hand, government announcements regarding public awareness programs, testing and quarantining policies, and income support packages largely result in positive market returns. Zaremba et al. (2020) demonstrate that non-pharmaceutical government interventions significantly increase equity market volatility and that the effect is independent from the role of the pandemic itself. Furthermore, results show that information campaigns and public event cancellations are the major contributors to the growth of volatility. Vast majority of papers deal with economic impact of Covid-19 on developed markets, where as Noy et al. (2020) argue that most of the economic risks from Covid-19 are in countries and regions that do not get much global attention in this pandemic, such as Sub-Saharan Africa, South Asia and Central Asia.

6. CONCLUSION

Year 2020 will without a doubt be remembered as a year of Covid-19 pandemic. The outbreak of virus was first reported on December 31, 2019 in Wuhan in China. Three months later national outbreak accelerated into global pandemic. The outbreak of Covid-19 virus and its wide global spread resulted in massive socio-economic risks worldwide. Commodity market was hit harder than ever before. The paper studies the coherence between Covid-19 pandemic (measured by total cases, new cases, total deaths and new deaths) and commodity futures markets (measured by futures prices and price volatility of 26 commodities). The general effect of Covid-19 on commodity markets can be observed in short-term price decrease and later price recovery as economy re-opened. The findings reveal that WTI crude oil, industrial metals and Gold experienced most intensive Covid-19 effects, with oil reaching its lowest ever price and gold reaching its highest price ever. Results on price volatility and Covid-19 - commodity price correlation differ across commodities, time periods and reference Covid-19 progression measure.

The value of this paper is reflected in comprehensiveness of commodity market analysis, that ranges over nine months' time period and 26 commodities. Obtained results offer valuable implications for both investors and academics. Academics can build their knowledge on forecasting models and investors benefit from further insight into coherence between pandemic and commodity prices, allowing thus deeper understanding of hedging features of commodities.

Important analytical implication of this study reflects in time period chosen for the analysis since Table 3, 4 and 5 show different results for comparable analysis over different time periods. When the analysed time period is shortened to a quarter, intensified effects can be observed with no other differences. However, when the analysed time period is shortened to a single month, effects are intensified and different Covid-19 progression measures impose themselves as the ones with dominant effect. Such discontinuity reveals that real Covid-19 effects will not be perceived if reports will be given on quarterly base, which is common in financial, market and government reports. A better landmark would be monthly analysis.

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IMPACT OF FAKE NEWS ON THE GLOBAL ECONOMY

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Abstract

Fake news is reshaping the world in the era of (de)globalization. Information around the globe spreads fast and grows in volume proportionally with technology development. Development of social media has had a profound influence on the way news is distributed. In these circumstances, distributors of fake content find fertile ground to support their interests. The goal of fake content is usually to affect user attitudes towards certain political and economic topics. Although there are few suggestions and methods from academic researchers on how this problem should be addressed, we still lack a unified tool to distinguish fake and authentic content on the web and social media. In order to shed more light on this understudied issue, this exploratory paper aims to provide an analysis of the impact fake news have on the global economy and to propose a conceptual model of user engagement on social media regarding fake news.

Key words: fake news, artificial intelligence, global economy.

1. INTRODUCTION

Constant technological development and the fourth industrial revolution have led to new breakthroughs in different areas. Information distribution and media were no exception. With the widespread use of daily information, it became impossible for social media companies to check and authenticate every information users place on their platforms and other users receive on their devices.

That loophole seems to attract a lot of opportunists who promote their personal interests by placing false content on the internet and social media and deceiving users by promoting misinformation. False news and content, or popularly called fake news seem to be a major problem and can impact global economy by impacting politics, business and citizens around the world by directing their behaviour with the misleads.

Our paper will aim to provide a literature review about the impact of fake news on socioeconomic factors and economic trends. Moreover, we will explore current recommendations for preventing harmful consequences of fake news on the digital platforms from other academic researchers. At last, our goal is to propose a conceptual model of user engagement on social media regarding fake news.

2. FAKE NEWS AS A RISK FACTOR FOR SOCIOECONOMIC STABILITY

Fake news can be promoted by individuals (motivated by profit), states or state-backed actors who aim to advance their geopolitical interests and by opportunists who want to discredit official sources. In the COVID-19 pandemics, false content put people in risk in a number of different ways as stated below (Europol, 2020):

- *By promoting fake products and services* (for example fake COVID-19 tests and vaccines)

- *By promoting a false sense of security* (for example misleading information about treatments);
- *By promoting suspicion of the official guidelines and sources*.

Fake news is deliberately fabricated to deceive readers. Generating this content increases readership and raises profits with clickbait. Creators often take part in psychological warfare with this act. In this kind of warfare, users on social media are very hard to differentiate authenticity of news, which affects decision-making (Aldwairi and Alwahedi, 2018).

> "*The rise of fake news highlights the erosion of long-standing institutional bulwarks against misinformation in the internet age. Fake news overlaps with other information disorders, such as misinformation (false or misleading information) and disinformation (false information that is purposely spread to deceive people)*." (Lazer *et al*., 2018)

Fake news used in topics like vaccination, nutrition, and stock values and usually in standard news outlets to undermine their credibility. Fake news can be also called "false news" as they are often used as political weapons (Lazer *et al*., 2018). According to Bilandžić (2019), mass brainwashing has been promoted in the media to destabilize society, and this category can be boosted by the fake news. There are a number of different ways fake news are created and distributed. We have analysed and systematized the most common methods below. Lyu (2020) states how through *social media laundering (where* videos are usually striped off meta-data, downsized, and then heavily compressed before they are uploaded to the social platforms*)* it is possible to recover traces of underlying manipulation.

In a political context, false content usually includes creating a fake video of politicians by manipulating their monologue. According to Maksutov *et al.* (2020), most usual ways of creating fake content using face-swapping algorithms are:

1. Face-swap – changing face of a victim and keeping victim's body
2. Lip- sync – adding another voice to victim's body
3. Making false statements with victim's tone of voice through audio engineering.

As we stated before, it is impossible to authenticate all content on social media and other digital platforms. According to Yu *et al*. (2019), nearly two billion images are added every day on the digital platforms. Ramamoorthi *et al.* (2019) state that WhatsApp with one of the largest user base with over 1.5 billion users across 180 countries worldwide is a target for social engineering attacks. These attacks consist of cyberbullying, phishing, punycode or homoglypic attacks, Deepfake videos, child pornography, malicious file forwards, account abduction, ransomware, psychologically straining and suicide inducing games.

Cyberbullying implies sending harassing or threatening messages and posting derogatory comments about someone on web or social media (Hinduja and Patchin, 2010), phising implies obtaining sensitive information from a victim by representing a trustworthy entity (Jagatic *et al*., 2007), converting secure web addresses to punycode (Hannay and Bolan, 2009), or in other words homoglypic attacks, stands for encoding algorithm used for web adresses to encode international domain names.

Deepfake stands for multimedia contents synthetically altered or created by exploiting machine learning generative models (Guarnera et al., 2020). It is generated by artificial intelligence algorithms and seems to be a big part of online disinformation (Lyu, 2020). According to Kolodenker *et al*. (2017), in order to achieve monetary gains, cyber-criminals use malware known as ransomware to hold victim's computer files until a ransom is paid.

Lazer *et al*. (2018) stated that on social media, social bots as automated accounts impersonating humans can magnify the spread of fake news by liking, sharing and searching

for information. Around 9 – 15% of active Twitter accounts are bots, while 60 million bots take part on Facebook network. Large number of bots often go undetected. In 2016, bots infected U.S. elections campaign and some of the same bots were detected to take part in 2017 French election later. Through their destabilization of social fabric, fake news also have a profound impact on the global economy. The development of artificial intelligence enabled new ways of creating fake news and faster dissemination of this content through social networks. Average user on social media can use artificial intelligence tools to create fake content on digital platforms. Fake content can be individually harmful if this content intentionally uses the citizen's identity due to personal interests.

> *"As technology races ahead of consumer expectations and preferences, companies and the public sector tread an increasingly thin line between their artificial intelligence initiatives, privacy protections, and customer service."* (Ransbotham *et al*., 2017).

In the past, machines have been used for automated routine tasks, but what makes artificial intelligence special is growing capacity for automated non-routine tasks or knowledge based work (Armour and Sako, 2020).

Artificial intelligence became a game changer and a lot of questions seem to be unanswered in the aspect of AI manipulation and intentional creation of fake content to deceive other users. AI needs to be controlled, but not in scientific and developing terms, but in terms of safety of citizens. According to Horowitz *et al*. (2018), AI could match or exceed previous large-scale shifts in the global economy. These consequences of AI could affect political and social factors.

Artificial intelligence did created a fertile ground for distributors of the fake content. However, when prevailing fake news, it is necessary to not discriminate against the development of artificial intelligence. On the contrary, companies need to educate employees about strengths and opportunities of AI and try to prevent harmful consequences of fake news by implementing new AI tools.

3. FAKE NEWS AND ECONOMIC TRENDS IN THE CONTEXT OF COVID 19 PANDEMIC

Throughout history, the democratic system in which we are living today, was built on people's trust in institutions and empowered by politicians and businesspersons with good ideals of living. People's trust institutions on micro level and diplomatic and business trust on a macro level was shaken with fake news appearance.

In 2020, COVID-19 pandemics completely changed how we perceive the world. Health researchers introduced the term i*nfodemics of false information.* According to Islam et al. (2020) infodemics include rumours, stigma and conspiracy theories. They are common to use in health emergencies, just like during the Ebola outbreak in DR Congo in 2019 and SARS outbreak in China in 2002/2003 where misinformation was linked to violence, mistrust, social disturbances, targeted attacks on healthcare providers and stigmatization of races.

We point out three key factors which could be triggered by false news and impact the global economy. Firstly, risks based on the labour force in the COVID 19 pandemics. Promoting fake news about COVID 19 and conspiracy theories impact people's mind about quarantine and measures regarding behaviour of people and raise the percentage of deaths in this pandemic. More deaths mean a change of structure in the labour force, which could impact wages.

Secondly, risks of promoting a false content about infrastructure development of the 5G network could make circumstances in the local area aggravated, which could lead to slower development of these areas.

Thirdly, placing fake news about election candidates and creating fake content like deep fake videos could impact people's mind to vote for another candidate. This could help radical political options to win the elections. Later it could lead to radical policies like radical trade restrictions or derivation of bad relationships between the countries.

Table 1. Impact of false content on the economy

FAKE NEWS	CONSEQUENCE	ECONOMIC OUTCOME
COVID 19 vaccination	Deaths	Decline of the labour force
5G network	Local regulations and aggravated circumstances	Slower development of local areas
Elections	Radical political options	Radical trade restrictions

Source: authors

These possible economic outcomes impacted by false news and promotion of fake content on the digital platforms are just projected examples. However, there are numerous examples of harmful consequences impacted by fake news.

Anti-vaccination and 5G conspiracy theories appear often on disseminated social media content which contradicts medical or scientific facts. Many people are refusing medical attention, one of the recent cases was a lady who suffered a heart attack and refused medical attention because she read on social media how she will die if she went to hospital (Independent, 2020). In Iran, more than 700 people have died after ingesting toxic methanol, thinking how alcohol can cure coronavirus(Al Jazeera, 2020). Also, 28% of citizens of the USA believe how Bill Gates wants to use vaccines to implant microchips in people (BBC, 2020).

One of the recent cases from September 2020 happened in California, Oregon and Washington when at least 36 people died with dozens more missing during the wildfires across the country. After this tragical event, conspiracy theory circulated in the social media how a far-left political group organised the fires. Later, FBI confirmed this as a fake news. (Euronews, 2020a). Earlier in September, a misinformation video about positive impact of hydroxychloroquine medicine as cure for COVID-19 was widely shared on social media, over 15 million times just on Facebook in four videos (Euronews, 2020b).

4. CURRENT RECOMMENDATIONS AND PROPOSED MODEL

In order to monetize on fake news by creating a large-scale disseminated content, organisations or individuals profit from number of readings through advertisements on their page, or by abducting trustworthy pages or accounts and placing a ransomware. In that situation, users need to act appropriate. There is no unified recommendation on how companies and governments should act to prevent atrocious consequences of fake content. However, companies tend to organize campaigns to raise awareness among their users.

To create a safe environment in countries, Chesney and Citron (2019) analysed a few research fields to focus on. It is necessary to explore technological solutions that would facilitate the detection and debunking of deep fake content, detect criminal and civil liability,

determine the role of the regulators and propose government's active measures and at last to anticipate the new services to protect individuals in the future.

Many countries do not have regulators on this level, but a good example can be the Defense Advanced Research Projects Agency (DARPA). Government agencies like the U.S. Government's DARPA work on the media forensics and work with world's best researchers in that field to prevent the media manipulation and provide the information of how these manipulations were performed.

Moreover, there are some recommendations from Europol (Europol, 2020) on what citizens can do when suspecting on fake information:

- *Be mindful* – clickbait headlines often mislead users.
- *Look around* – check website information like contact info and about section.
- *Check the sources* – check for other news sources about this story.
- *Photo search* – media can be out of the context and can be an example of misinformation.
- *Check the date* – are the news re-published and promoted as current stories.
- *Turn to the experts* – World Health Organization, national health authorities and the European Commission are the right addresses.

Image forensic experts find it possible to detect anomalies and differentiate real from fake media. Google launched a database of fake videos to support researchers in development of detection methods while Facebook and Microsoft started a campaign called Deepfake Detection Challenge with a goal to create new tools of detection (Guarnera *et al*., 2020).
According to Lazer *et al.* (2018), the new system of safeguards is needed and we should redesign our information ecosystem in global scope to promote and value truth. The best and long run approach focuses on improving individual evaluation of the quality of information sources through education with training of critical-information skills in primary and secondary schools. In addition, there should be two categories of interventions in fake news, empowering individuals to evaluate the fake news they encounter and structural changes aimed at preventing exposure of individuals to fake news in the first instance.

Hasan and Salah (2019) suggest a Proof of Authenticity (PoA) of digital media to help eradicate the forged content. They think that current solutions lack the ability to provide history tracking and provenance of digital media. Content is more realistic if it has more samples - for example fake Obama video was created with more than 56 hours of sample recordings. Their PoA model is using the disruptive blockchain technology, which has capabilities to provide key features that can be utilized for proving authenticity and originality of digital assets in a highly trusted and secure decentralized way.

According to Fountain *et al*. (2019) organizations should educate employees from the top to the bottom, especially on the management level, where senior executives need to identify and prioritize AI opportunities, while data scientists, engineers and architects should improve their analytical skills, and other workers to have fundamental technical training.

Aldwairi and Alwahedi (2018) propose a solution to develop a tool with the specific aim of detecting and eliminating web pages that contain misinformation intended to mislead readers. Users would need to install this tool on their devices and when they browse content on the internet or social media, web pages will be flagged as being potential sources of fake news, and the user will be notified before electing to click on either one of them.

Upgraded users can use Amped Authenticate software (Amped, 2020) to unveil the processing history of a digital image and determine the authenticity of images and documents and identify the device used to take a photo.

Social networks and other digital platforms involving users on a large-scale, should strengthen their impact and give them a bigger role in the terms of authenticity of the content. Users need to have an option to mark the content as false or authentic. It is impossible to predict or ban false content in absolute terms, but users should act as agents of change, especially if companies and governments educate citizens about the negative impact of fake news in the long-term, since this seems to be an rising problem in the world.

The New York Times reported in July this year (New York Times, 2020) that Twitter accounts of Barack Obama, Bill Gates, Elon Musk and many other public figures posted a message: *"Send Bitcoin and the famous people would send back double your money."*. Twitter did remove these fake content and in a matter of time it was posted again, meaning that Twitter does not yet have appropriate methods for these attacks.

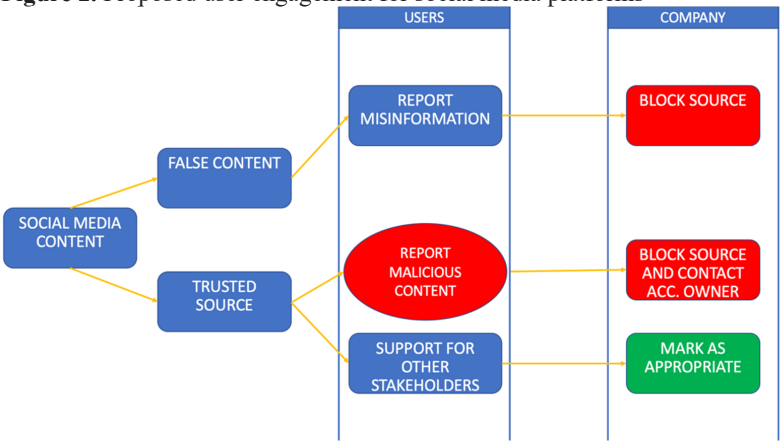
Following this recent Twitter attack, both users and social media companies are concerned when authenticated sites are being hacked and they promote fake news which deceives users. Creating a safe social media platform should comprehend user engagement with larger control over content.

Reporting a false content will lead to blocking a source of the misinformation. Similar option was introduced by Facebook and widely adopted in a fight against cyberbullying when they gave users authority to report content as inappropriate. In that way, introducing an option to report fake news would not be technically a revolution.

However, when a source of a fake news is trusted source, like ones from government or public persons, the key action may be (besides bigger authority) to change perception of user engagement and involvement in a fight against fake news.

Considering a large-scale of daily information, social media companies cannot authorize every post, not even if they outsource this service. However, users engagement may be the key of change, especially if they motivate users by giving them premium content or creating special reward system by promoting authenticity and safe environment. Company afterward is responsible to act on a legal matter and block the source of information.

Figure 2. Proposed user engagement for social media platforms



Source: authors

As we mentioned before, sharing malicious content like anti-vaccination campaigns or false medicine for COVID 19 had lethal consequences. The proposed model could create a safer environment and reduce the negative impact of fake news on the global economy.

However, structured formal education may provide long-term benefits for society. Learning key elements of news, like authenticity, importance and precise matter can be a part of a formal education. Also, it is necessary to create government infrastructure for backing up this process.

It is crucial not to discriminate against the development of technology, but to educate young people about the content they are reading on a daily basis. Also, AI must be a partner in a fight versus AI and that will contribute to the authenticity of the content. The prism of observing information is changing and it is necessary to analyse every news and its credibility, especially on the social media platforms.

5. CONCLUSION

With the large volume of information and growing reach on social media, it became aggravated for social media companies to check and authenticate all content users place on their platforms. Fake news impacts the global economy by misleading readers on political and business content. Rapid development of technology, specifically artificial intelligence and machine learning backed up this process and helped find new ways to create and distribute fake content. Although there is no unified tool for detecting false content, we brought up some useful proposals from various researchers. In this paper, we proposed user engagement for social media platforms to involve users of social media in a fight against fake news. Creating a safe social media platform should comprehend user engagement with larger control over content. We believe that structured formal education may provide long-term benefits for society by learning the importance of content authenticity and negative implications of fake news and recommend this as a future research.

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RISK OF WAR DURING THE COVID-19 PANDEMIC

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Abstract

Prior to COVID-19 pandemic the world never looked better. With a few regional clashes prospect for a major war between world countries was lower than ever. US strike on general Qasem Soleimani was the last major clash before the pandemic hit the world outside of China. Wars between countries have declined but internal conflicts were still on the rise and with a chance to escalate into regional or global wars. Rise of far-right nationalism and populism around the world also increased chances of war. The pandemic took its toll on democracies, destroying economies and limiting international cooperation. Therefore, with the prospect of war, trade is predicted to fall. While the pandemic has failed to stop interstate conflicts, the shape of the post-pandemic world was formed even before the pandemic started and the risk or war was already on the rise. Assault on open trade and globalization was just one aspect of crumbling liberal international order, to some it preserved peace between nations since WW2, but that order is almost gone and likely not coming back. The risk of war is on the rise with the warning signs that were exposed during the pandemic. In the aftermath of the pandemic and when its containment is behind most countries, the economic ramifications from this period will continue to undermine stability and security of the world. This paper will explore the possibility of starting new wars that would be caused by a pandemic.

Keywords: *COVID-19, pandemic, war.*

1. INTRODUCTION

Pandemics have been around for a long time. The Black plague in the 14th century killed 60% of the population of Europe, and more recently, the 1918 Spanish Flu killed 50 million worldwide. In addition to forecasts by many epidemiologists, the occurrence of another devastating epidemic was predicted by Bill Gates. In April 2015, Bill Gates on Ted Talk warned that *"Today. The greatest risk of global catastrophe doesn't look like war. If anything kills over 10 million people in the next few decades, it is most likely to be a highly infectious virus rather than a war. Not missiles, but microbes. Now, part of the reason for this is that we have invested a huge amount in nuclear deterrence, but we have invested very little in a system to stop an epidemic. We're not ready for the next epidemic"* (Gates, 2015).

There were also other indications pointing to the pandemic in the making, hence this information was public. Decision makers knew that this could happen and that is was going to happen. They also knew that they had to create framework to prevent or contain it.

On 31 December 2019, the WHO China Country Office was informed of cases of pneumonia of unknown cause detected in Wuhan City, Hubei Province of China. This happens to be the very same place where the 14th century Black Plague originated from. From 31 December 2019 through 3 January 2020, a total of 44 case-patients with pneumonia of unknown cause were reported to WHO by the national authorities in China. During this reported period, the causal agent was not identified. On 11 and 12 January 2020, WHO received further detailed information from the National Health Commission China that the outbreak is associated with

exposures in one seafood market in Wuhan City. The Chinese authorities identified a new type of coronavirus, which was isolated on 7 January 2020. (World Health Organization, 2020).

From that moment the world will never again be the same. There is little doubt that China badly botched the initial handling of the outbreak, quieting doctors who warned about it, and closing Wuhan and the Hubei province three weeks later after the outbreak. By that time, many people left the city and the virus started to spread worldwide.

Prior to WHO reporting on emerging pandemic, we lived in an era of disruption in which powerful global forces were changing how we live and work. The rise of China, India, and other emerging economies and the rapid spread of digital technologies were shaking both economy and the society. Numerous new opportunities were created for various business sectors, countries, and individuals that embrace them successfully. At the same time, the downside for those who cannot keep up has also grown disproportionately. Much of the recent focus on globalization has been on trade pullbacks, rising protectionist measures, and public hostility. Yet globalization has not gone backwards; rather, it has shifted mechanism to become more data driven. While cross-border flows of goods and finance have lost momentum, data flows helped drive global GDP and cross border data bandwidth is expected to grow in the following years as digital flows of commerce, information, video communication as well as intracompany traffic continues to surge.

Today we know that the pandemic has been caused by a virus, however, judging by the response, we also know that it was enabled by human beings with political responsibilities. There may be no way to prevent a COVID-19 pandemic in this globalised time, but verified information is the most effective prevention against the disease of panic. Addressing the Munich Security Conference on Feb 15, 2020, WHO Director-General Dr Tedros Adhanom Ghebreyesus said, “we’re not just fighting an epidemic; we’re fighting an infodemic” (World Health Organization, 2020).

The ease through which inaccuracies and conspiracies can be repeated and disseminated via social media and conventional platforms puts public health at a constant disadvantage. Rapid dissemination of trustworthy information - data sharing, transparent communication, and peer-reviewed research is the only way to fight against inaccuracies and conspiracies (The Lancet, 2020).

2. THE WORLD BEFORE COVID-19

For the past two centuries, starting with the 19th century, it was Britannia that comprised an empire spanning much of the world. In the 20th century, especially after World War Two, it was United States that took over as the leading superpower but in competition with the Soviet Union. However, since 2014 China had a larger economy than that of the United States. This is often disregarded by those who argue that a better metric to compare the size of economies is GDP at market prices, according to which the US is still the biggest economy (Euromonitor International, 2014).

Prior to COVID-19, the world was undergoing massive business digital transformation moving quickly to global digital economy. Success of internet giants such as Amazon, Google, Netflix and others illustrates the best how such business models became integral parts of our lives no matter where we are in the world. At the same time, unending parade of summits, crises, and protests have dominated the news. To name just a few, North Korea-U.S. Nuclear talks stall and no progress has been made in containing North Korean nuclear weapons program. On the other side of the world, The United Kingdom ended 2019 with clarity about Brexit and the withdrawal deadline was extended to January 31, 2020 when the UK exited the EU. Trade

war between U.S. and China continued and the agreement on tariffs failed to settle the major differences between two economic super-powers. In the Persian Gulf the war seemed imminent at several points in 2019; four commercial ships were attacked, and the U.S. accused Iran of being responsible for the attack; drones struck two major Saudi oil refineries; U.S. announced sending 14,000 troops to Saudi Arabia. As the Amazon burns the mounting evidence that the planet is warming still has not called for global action. Brazil rejected offers for help to fight the fires and scientists warned that deforestation in the Amazon had reached a point where it might become a savanna, which would "release billions of tons carbon into the atmosphere." In the U.S. the Congress approved two articles of impeachment for President Trump. However, the whole 2019. could be summarized as the year of protests as they flustered many countries including Algeria, Sudan, Chile, Iraq, Iran, Bolivia, India, Nicaragua and Russia with protests in the Hong Kong setting up precondition for a potential confrontation with China. Yet prospect for a major war between countries in the world was lower than ever (Council of foreign relations, 2019).

The number of conflicts in the world reached its highest point since World War II in 2016, with 53 state-based armed conflicts in 37 countries. All but two of these conflicts were considered civil wars. To make matters worse, new studies have shown that civil wars are becoming longer, deadlier and harder to conclusively end, and that these internal conflicts are not internal. Civil wars harm the economies and stability of neighboring countries, since armed groups, refugees, illicit goods and diseases all spill over borders. Some 10 million refugees have fled to other countries since 2012. The countries that now host them are more likely to experience war, which means states with huge refugee populations like Lebanon, Jordan and Turkey face legitimate security challenges. Even after the threat of violence has diminished in refugees' countries of origin, return migration can reignite conflicts, repeating the brutal cycle. recent research indicates that civil wars increase the risk of interstate war, in large part because they are attracting more and more outside involvement. In addition to the spillover effects, two other factors in civil wars increase international tensions and could possibly provoke wider interstate wars: external interventions in support of rebel groups and regime attacks on insurgents across international borders (Gleditsch, 2008).

Through digital transformation, digital technologies have been reinventing the way we live, work, and organize in the new global digital economy. Advanced analytics and the Internet of Things have helped to transform businesses world-wide. Companies such as internet giants who are digital leaders in their respective sectors had higher revenue growth than their less digitized peers. However, full digital economy has not yet gone mainstream as industries still have lots of potential to digitize their processes and become fit for the future. Next wave of innovation such as advanced automation and artificial intelligence started to enable a new generation of system level innovation (McKinsey&Company, 2019).

3. WORLD ORDER AND PANDEMIC

The pandemic happened in time when nationalist and populist leaders were in power. US strike on general Qasem Soleimani was the last major clash before the pandemic hit the world outside of China. The values of cooperation and mutual aid were no longer relevant. After WW2 bipolarity imposed a balance of challenge containment based on mutual deterrence with small margin for cooperation. After the fall of Soviet Union, the United States was not ready to seize the political and economic vacuum. Conflicts continued, this time of different nature, deepening international destabilization. To name a few, numerous terroristic events, collapse of so-called Arab spring revolutions, Middle east conflicts, economic and financial crisis, migration,

globalization problems shaped the international framework of the present pandemic (The Economist, 2020).

Prior to start of the pandemic the world has already changed with the rise of far-right nationalism and populism around the world. Hence, the pandemic took its toll on democracies, destroying economies and limiting international cooperation. The international community changed from liberal democracies to nationalist populism, economic protectionism and diplomatic unilateralism. Suddenly when the pandemic happened it broke the populist dream and imposed death, pain and anger upon many countries of the world.

In the first hours of the pandemic, which hit particularly China, Iran, Italy and Spain, the secrecy of the Chinese authorities turned the virus into a danger of universal scope. Different policies adopted to cope with this crisis dominated the discourse about the virus, which resulted with fear and mistrust. Somehow the illusion was created that the world will unite during the hard times created with this pandemic and negative trend will overturn; nationalism, fanaticism, cultural differences, economic greed shall disappear, however, eight months into the pandemic it did not happen. National populism remains intact and there is still misunderstanding between nations. The denial of science and of expert advice is a signature feature of populism (Foreign Affairs, 2020).

In the United States which was hit hard with the pandemic, President Trump wanted to take advantage of it by discrediting China by accusing Chinese authorities of being responsible for the outbreak and the spread of the virus worldwide. In order to shift public opinion China focused its diplomacy on turning the situation around by presenting China as a champion of solidarity and respect for others. Even in Croatia we have witnessed such cooperation through the "mask diplomacy", an important operation that has brought sanitary material such as protective masks produced in China to an important number of countries. On another front, the European Union has been a key factor in emphasising the discourse and the offer of solidarity and in pointing to the crisis as an opportunity to improve the situation and the governance of international affairs.

China's diplomacy is marked by a great emphasis on the distribution and supply of contextually important resources (e.g. medical aid, equipment, and supplies) as a means of securing mass and elite buy-in. Mass donation of masks and supplies to ailing hospitals and local charities are pivotal in rehabilitating China's historically maligned and recently ignominious image different areas. For example, while tensions are rising in Italy over China's Belt and Road Initiative (particularly in relation to its potential displacement of the north as Italy's economic lynchpin), China's provision of much-needed support, even as Europe collectively fails to rally around one of its largest economies, could be pivotal in winning the hearts and minds of many traumatized Italians. Furthermore, China's provision of financial aid and securing of relatively stable medical supply lines show the advantages of central governmental planning. The West can dismiss such actions as "political manipulation," but through tactical delivery of instrumental support China is able to court the favour of sceptics while consolidating the credibility and presence of pro-China factions within European nation-states (Wong, 2020).

China takes very seriously the securing of domestic and popular support among targeted entry points in Europe. From opening up more regions to Chinese investment to expanding China's ideological and political mega-projects; from transforming Europe into an environment more amenable to Chinese tech conglomerates (although perhaps not Huawei specifically) to forging a significant geopolitical "buffer zone" between the receding transatlantic alliance and Russia - these are objectives that require a substantial volume of backing or tacit endorsement from European civil society. The second feature of China's mask diplomacy is its emphasis

upon establishing long-term dependence relations and patronage networks. As a part of the country's "Go Out Strategy," China has come under significant criticisms for its alleged "debt trap diplomacy." The argument goes that China deliberately lures countries into its international projects and loans with seemingly lucrative, short-term returns, but in fact entraps these states in persistent and sovereignty-constricting loan arrangements. As pointed out by sinologists and writers – chiefly Parag Khanna – this conception of Chinese diplomacy is both empirically flawed and interpretively naïve. I suggest here that the real "debt" – to the extent that it exists – rests with the sense of moral and psychosocial debt and holistic, stealthily maintained dependence relations that characterize China's interactions with these states. Through offering emergency relief at critical junctures such as natural disasters and public health crises, including during the COVID-19 pandemic, China gains unrivalled and significant access to the critical infrastructure within the states that open themselves up to China, as well as the opportunity to foster sentiments of gratitude and tit-for-tat reciprocity among mid-level bureaucrats (Wong, 2020).

COVID-19 has heightened trends that deepen the risk of violence and instability within states: democratic backsliding, economic collapse, and the scapegoating and targeting of minority communities. Regimes that are neither fully democratic nor fully autocratic, called "partial democracies" have been found in numerous global studies to be most at risk of political violence. Already, COVID-19 has provided a useful tool for would-be authoritarians in such states to obtain and consolidate emergency powers. Hungary, Serbia, and Egypt are but three examples. Governments, including those of Thailand, Bangladesh, Cambodia, and Venezuela, have detained journalists for criticizing the official response to the pandemic, and several countries have limited or barred protests. coronavirus containment measures and their violent enforcement have provided a cover for state-led repression that is also likely to heighten group grievances, erode civic trust, and increase unrest. Saudi Arabia and Pakistan imposed lockdowns that disproportionately restricted minority groups, and Malaysia swept up refugees and migrant workers in mass raids and detentions. In the United States, law enforcement has been criticized both for using excessive force to enforce anti-coronavirus measures in minority communities and for policing demonstrations in ways likely to spread the virus further, such as using chemical agents that activate mucous membranes and jailing large groups of nonviolent protesters. Citizens have also carried out significant violence against authorities and public health measures; from violent attacks on retail store workers enforcing mask wearing to a state legislature closing its session amid armed protests and death threats against the state's governor (Goldstone, 2011).

4. THE NEW THREATS

4.1. International politics

High politics is about the survival and security while the low politics is about everything else. Opposite to classic threats such as the military, protection against the pandemics does not require exercising power over other states, but rather with other states. Public health is not private or public good, but a network good. Private goods are those that a state possesses exclusively and from the use of which it can exclude third parties. Example is a nuclear aircraft carrier. On the other side, public goods are those that a group of states produce but from the use of which it cannot exclude third parties. For instance, maritime regulations. Public goods create incentives for defection and two possible responses are: monitor and sanction defection and the other is to accept it. Network goods are those whose usefulness increases with their dissemination. The most current example is vaccines and immunisation in general. Countries

are not indifferent to whether its citizens are healthy as it is in their interest in citizens to be healthy for health or economic reasons (Copeland, 2014).

The appropriate strategy is cooperation and not competition. The new threats are "new evils", whose capacity for harm increases with their spread. In the absence of clear international leadership, this requires cooperation in networks.

4.2. International organizations and countries

Overcoming pandemic requires international cooperation and fighting it encourages national isolation. From today's perspective, political organizations responded worse than the functional ones. The United Nations played almost no role, while the World Health Organization become a reference for many states. Similar effect happened on local levels, for instance European Union as the political body of the Union was sometimes controversial, but European Central Bank was up to the task and it protected euro whose implosion could be deadly sequel to the coronavirus (World Health Organization, 2020).

Developing countries face health, economic and social crisis. Response to emergency requires response from the state, the issue is that they cannot build capacity in a short period of time. If the social order is totalitarian the state might not necessarily take care of its citizens; by negligence and denial it might also kill them. The pandemic might encourage and strengthen state power – either despotic or infrastructural. Despotic is the ability of the state to act coercively without legal constraints. Infrastructural is its ability to penetrate society and organize social relations. Most effective countries will be those that would first immunize their population and allow the to fully return to work.

Threats of the future include geopolitical rivalry and technological competition. Future needs less nationalism and more functional international cooperation on all levels, including scientific, health and financial.

5. RISK OF WAR

Fully democratic countries are less likely to experience civil war and rarely, if ever, go to war with other democracies-though, of course, they do still go to war against non-democracies. There have now been 14 consecutive years of global democratic decline, and there have been signs of additional authoritarian power grabs in countries like Hungary and Serbia during the pandemic. If democracy backslides far enough, internal conflicts and foreign aggression will become more likely. Normally countries work to preserve ties when there are high expectations for future trade, but war becomes increasingly possible when trade is predicted to fall. If globalization brought peace, the recent wave of far-right nationalism and populism around the world may increase the chances of war, as tariffs and other trade barriers go up-mostly from the United States under President Trump, who has launched trade wars with allies and adversaries alike (Munck Verkuilen *et al.*, 2002).

The coronavirus pandemic immediately prompted further calls to reduce dependence on other countries, with U.S. asking companies to reconfigure their supply chains away from China. On their side, China made sure that it had the homemade supplies it needed to fight the virus before exporting extras, while countries like France and Germany barred the export of face masks, even to friendly nations. Because of the pandemic, widening economic inequalities are not likely to enhance support for free trade. This assault on open trade and globalization is just one aspect of a decaying liberal international order, which has largely helped to preserve peace between nations since World War II. But that old order is almost gone, and likely isn't coming back. The U.N. Security Council appears increasingly fragmented and dysfunctional.

Even before Trump, the world's most powerful country ratified fewer treaties per year under the Obama administration than at any time since 1945 (WPR, 2020).

We are experiencing a situation like that at the end of the Second World War. After the destruction and human and material losses, all European nations began to design plans and programs for the reconstruction of the old continent, mostly through the Marshall Plan, in order to ensure that European society would have the well-being, dignity and prosperity that it deserved. On the European side, the Union suffered a crisis of inaction, allowing individual and often uncoordinated reactions from each member state a proof of the lack of union and internal cohesion. However, the European Parliament has urged international organizations such as World Health Organization and the World Trade Organization to undertake reforms in order to establish a catalogue of essential health emergency products to ease their trading and speculation generated by high demand. On the other side, the United States has increasingly remained on the sidelines with the slogan "America first" while China was trying to embody the values of the West such as peace, solidarity and cooperation as their own. This behavior represents China's desire to achieve world hegemony by occupying the great vacuum left by the United States (Freedom House, 2020).

All governments face hard choices about how to manage the virus. Countries from the Schengen area to Sudan have already imposed border restrictions. Many are placing partial or blanket bans on public gatherings or insisting that citizens shelter at home. These are necessary but also costly measures, especially given projections that the pandemic could continue for well over a year until a vaccine becomes available. The economic impact of restricting movement for months on end is likely to be devastating. Lifting restrictions prematurely could risk new spikes in infections and require a return to isolation measures, further compounding the disease's economic and political impact and requiring further injections of liquidity and fiscal stimulus by governments around the world.

Covid-19 has not had the shattering effect on military power the Spanish Flu had a century ago. Modern health care is vastly better. Today's pandemic, unlike the earlier one, largely spares the young adults who fill the ranks of armed forces. But as governments have been preoccupied at home and distracted abroad, the virus has deepened geopolitical tensions between America and China, above all and worsened what was already a burning international mood.

When the financial crash prompted a global economic downturn in 2008, the U.S. still held enough clout to shape the international response through the G20, although Washington was careful to involve Beijing in the process. In 2014, the U.S. took charge of a belated multilateral response to the West Africa Ebola crisis helped by countries ranging from the UK and France to China and Cuba. Today, the U.S. – whose international influence already had considerably weakened – has simultaneously mishandled its domestic response to COVID-19, failed to bring other nations together and stirred up international resentment. President Donald Trump has not only harped on the disease's Chinese origins but also criticised the EU for bungling its containment (Gardini, 2020).

Opportunities created by COVID-19 pandemic and crisis are, on the political level, the big push by the UN for a global cease fire in response to COVID-19, which created a lot of excitement has lost steam as the Security Council took months to endorse the idea due to tensions between China and the United States, as well ignorance of armed groups in countries like Yemen, that ignored calls to pause hostilities. Therefore COVID-19 is not going to lead to world peace but there could be lower level opening for humanitarian ceasefires and pauses around the disease. It is obvious that it would be easier to get combatants to agree to low-key dialogues and practical cooperation on public health measures than broader ceasefires or

complex peace processes. Envoys and peacekeepers have faced travel and movement restrictions, and it is quite hard and impossible to mediate over social media platforms. Political effects will most likely last longer than a year. There is a comparison with the 2008 economic crisis, which didn't lead to an immediate surge in conflicts but contributed to the waves of major protests we have seen since then, from the Arab world in 2011 to Chile last year. COVID-19 could well trigger a similar "long tail crisis" in political terms, creating an extended period of instability in many places (The Economist, 2020).

6. CONCLUSION

COVID-19 caught many actors by surprise. But the warning signs of a new wave of political violence are now plainly evident. The challenge for violence prevention, both between countries and within them, is to pay attention to new conflict dynamics in order to better understand how peace, security, and their opposites play out in the lives of the authorities and the governed around the world.

We are in a period of transition, which began in the second decade of the 21st century. The world is moving from unipolarity to bipolarity or to multipolarity, which is likely going to mature during the first third of the century. The new geopolitical model of dual bipolarity will have two great poles competing. The Trans-Atlantic pole made up of the United States and the European Union, based on the currently weakened transatlantic link; and the authoritarian Eurasian pole, made up of China and Russia, supported by the Eurasian partnership whose influence is growing stronger.

Regardless of what happens whenever the pandemic is resolved; it will be tempting to point to the coronavirus as the cause. But the shape of the post-pandemic world was forming long before the virus began to spread, and the risk of war was already rising.

Foreign relations should be characterized by diplomacy and development, not defense. The United States will need to make up with its friends and reengage in multilateral efforts to tackle global problems and resolve ongoing civil wars. International institutions should be consolidated and modernized to better respond to an unstable world with gathering threats like infectious diseases, climate change, growing inequality and demographic shifts. With the international order slowly crumbling and the United States retreating to focus on its own internal problems, the tendency for other countries will be to enhance their own border protections. But even in the absence of U.S. leadership, other countries are better served by increasing their international diplomacy and engagement, rather than buttressing their own defenses (The Atlantic, 2020).

Most important changes that will take place in the world post COVID-19 can be outlines as acceleration of the world reordering within the framework of dual bipolarity and the multinational institutions and organizations. Also, possible geostrategic movement of the Eurasian pole against the interests of the Trans-Atlantic pole. Even the worsening of the loss of Western leadership. Governments will have to decide whether to support more cooperative approaches to handling the crisis, not only in global public health terms but also as a political and security challenge. All leaders face pressure to focus on and spend money and political capital on domestic priorities, and to ignore conflict risks in weak states that may seem hard to resolve or simply not important enough to worry about. But there will be a day after, and if the coming period is not dealt with wisely, it could be marked by major disruptions in already conflict-ridden areas, the eruption of new violence and a far more fragile multilateral system.

The novel coronavirus may not be a threat that the military can defeat, but that doesn't mean the world should not set it in its sights and go on the offensive against it. The coronavirus has exposed the preexisting conditions for major war. How countries respond will help determine whether the pandemic will accelerate the drift toward more conflict, or if that trend can be reversed. The coronavirus and how it will be dealt with is likely to have a profound influence on the shape of the multilateral order that will emerge in its aftermath. It is too early to assess those implications. Developing an effective national response to COVID-19 could begin with elevating the pandemic from a public health emergency to a national security crisis.

Future research could explore topics such as the economic loss caused by the spread of COVID-19 in countries affected by sanctions and conflict mediation over social media platforms during pandemic.

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INVESTIGATING THE COMMON FEATURES OF COVID-19 HIGHLY INFECTED COUNTRIES USING K-MEANS CLUSTER ANALYSIS

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Abstract

One could ask what are the common features of COVID-19 highly infected countries. Various researchers have tackled this research problem taking into account a range of different variables. This paper investigates the properties of COVID-19 highly infected countries using k-means cluster analysis. The optimum number of clusters was identified using the two-step cluster procedure according to the Schwarz's Bayesian Information Criterion (BIC) with the log-likelihood distance measure. Results of the analysis have shown that developed, tourism-oriented countries with elderly population structure, improved human rights and index of freedom are more vulnerable to the risk of COVID-19 contagion. Limitation of the paper is related to the fact that data for COVID-19 common features were not available for the year 2020 but have been provided for the most recent year, mostly 2018. The results obtained from this analysis have important policy implications for economic and health care policy makers.

Key words: COVID-19, K-means cluster analysis, International tourism.

1. INTRODUCTION

The COVID-19 outbreak started in the capital city of Hubei Province in China, Wuhan, in December 2019 spreading across the world. Millions of people lose their jobs in the upcoming months with companies shutting down their operations and announcing layoffs, Fernandes (2020). Coronavirus outbreak led to spillovers into major sectors of global economy triggering fast policy responses by several governments prolonging the recession while trying to save lives of citizens, Peterson and Thankom (2020). Social distancing policies and lockdown restrictions hurt the economies through the reduction in the level of general economic activities. Amidst a significant public health risk that COVID-19 poses to the world, the World Health Organization has declared a public health emergency in order to coordinate international responses to the disease, Warwick and Roshen (2020). One could ask what are the common features of COVID-19 highly infected countries. Various researchers have tackled this problem taking into account a range of different variables. According to Vigdorovits (2020) variables that are positively correlated with an increased risk of COVID-19 disease transmission are higher personal freedom in a country, higher gross domestic product and population. Keita (2020) considers international air travel, Ranasinghe et al. (2020) the number of international tourists while Sirkeci and Yucesahin (2020) take into account population size, high income and human development index (HDI) as an important determinant of disease spread. They also include additional variables such as immigrant stocks from the origin of each destination and the neighbouring countries impact as a dummy variable. Marrouch and Sayour (2020) considers the level of economic development and share of population aged 0-14 as the salient factor for the larger number of confirmed cases of infection as well as the population over 65 for the case of fatalities. Hossain (2020) focused on lower yearly average temperatures, higher economic

openness and stronger political democracy in a country. Sherpa (2020) and Stojkoski et al. (2020) highlighted the relevance of government health expenditures cuts and population size.

Goal of this paper is to investigate the common features of COVID-19 highly infected countries using the k-means cluster analysis. In the analysis the two COVID-19 variables, total number of cases and total number of deaths, will be clustered together with the eight variables for which it is assumed to pose an increased risk of COVID-19 disease transmission. These variables are international air transport, GDP per capita, Human Development Index (HDI), Human freedom (Score), international tourism, median age, population and population density. In the analysis standardized values of the observed variables will be used. The optimum number of clusters will be identified by applying the two-step cluster procedure while the automatic selection of the cluster number will be chosen according to the Schwarz's Bayesian Information Criterion (BIC) with the log-likelihood distance measure. It is expected that some of the aforementioned non-COVID-19 variables will have a good predictor importance in the clustering with the COVID-19 variables.

Paper is structured in five chapters. After the introduction, literature review elaborates on common features of COVID-19 highly infected countries. In the methodology and data section descriptive statistics of data and methodology of the paper are explained. The optimum number of clusters is identified using the two-step cluster procedure. In the results section the final cluster centres for the total cases and deaths are calculated by using k-means clustering. Final chapter presents concluding remarks.

2. LITERATURE REVIEW

Sirkeci and Yucesahin (2020) showed that COVID-19 spread around the world can be mapped out and estimated using macro variables such as population size, high income, human development index (HDI) and immigrant stocks from the origin of each destination. There was also an evidence for confirming the expansion of disease to neighbouring countries. By monitoring immigrant stock and data on human mobility corridors, countries could have been better prepared for spread of COVID-19. Krisztin et al. (2020) using the spatial econometrics of the coronavirus pandemic found that cross-country spatial spillover processes via international flight connections played important role in early stages of coronavirus spread. Therefore, shutdown of international airports and border closures were important in order to prevent further virus spread. Keita (2020) discussed the role of international air traffic in spreading the COVID-19 around the world on a sample of 34 mostly European countries reporting international flights to 154 destination countries. The results of the analysis indicate that more connected countries registered first cases of infection significantly earlier than less connected countries. Early implementation of air travel restrictions were associated with a delayed onset of infections.

According to Vigdorovits (2020) various social and economic factors determine the time in which the epidemic reaches a country. A key finding of the study is that higher personal freedom is associated with a less time a pandemic need to reach a country. For some countries, like Sweden which tried to limit social and economic disruption, the model predicted higher mortality rates. Other variables such as higher GDP per capita and population also reduce survival time. On the other side, a greater distance from the outbreak source increase it. Marrouch and Sayour (2020) investigated the determinants of COVID-19 infection using a sample of 217 countries and territories. They found that the level of economic development was the most salient variable in terms of the number of infections in addition to the share of population aged 0 to 14 which proved as a significant factor of transmission of the disease. In

terms of the number of deaths, countries with higher share population aged 65 or above also experienced more deaths from the COVID-19 pandemic. Hossain (2020) answered on the question why the spread of the disease is not even across countries and what affects it. He linked the severity of the disease with the environmental, economic and social factors of a country. The number of confirmed cases of COVID-19 infection was higher in countries with lower yearly average temperatures, higher economic openness and stronger political democracy.

Sherpa (2020) estimated the impact of austerity policies on COVID-19 fatality rates using quantile regression models. The results have shown that austerity policy through health expenditure cuts significantly increases the mortality rates of COVID-19 in OECD countries. Furthermore, a higher share of population with pre-medical conditions and older age population tend to increase fatality rates. Leiva-Leon et al. (2020) proposed the empirical framework to measure the degree of weakness of the global economy in real time constructing a Global Weakness Index able to provide daily realtime updates of the global economy strength, sources and risk assessments. Stojkoski et al. (2020) suggested that a handful of socio-economic determinants can robustly explain the extent of the coronavirus pandemic. Two main determinants strongly related with the coronavirus cases are population size and government health expenditures. Potential tourists tend to postpone and cancel their plans for destination that is plagued by a disease, Folinas and Metaxas (2020). The coronavirus convulsed the world tourism industry. Coronavirus epidemic first attacked the international travellers because pandemic was caused through the travel, Ranasinghe et al. (2020).

3. METHODOLOGY AND DATA

In this section research methodology and data used in the analysis will be displayed and elaborated. In the analysis two main COVID-19 variables are under the study. The total cases and the total deaths due to the COVID-19 are observed at three time points: on April 1, April 15 and April 29, 2020. The data for those two variables are taken from the EU Open Data Portal (2020). In addition to those two COVID-19 variables, following eight non-COVID 19 variables, according to conducted literature review and previous research, are taken into account: Air transport, passengers carried, 2018 (World Bank, 2020a); GDP per capita, 2018 (World Bank, 2020b); Human Development Index (HDI), 2018 (Human Development Report Office, 2020); Human freedom (Score), 2017 (Cato Institute, 2020); International tourism, number of arrivals, 2018 (World Bank, 2020c); Median age, 2020 (Global Change Data Lab, 2020); Population, 2018 (World Bank, 2020e); Population density, 2018 (World Bank, 2020d). The most recent yearly data for the non-COVID 19 variables are collected. Unfortunately, not all the non-COVID-19 variables are related to the same year. The data are collected for 111 countries worldwide. The basic descriptive results for the observed variables are given in Table 1.

Table 1. Descriptive statistics results for the observed variables, 111 countries

	Variables	Statistics			
		Average	Standard deviation	Coeff. of variat.	Median
COVID-19	Total cases 1.4.2020	7,066	24,579	348%	533
	Total cases 15.4.2020	16,437	64,134	390%	1,373
	Total cases 29.4.2020	25,770	102,319	397%	2,131
	Total deaths 1.4.2020	346	1,519	439%	6
	Total deaths 15.4.2020	1,073	4,021	375%	28
	Total deaths 29.4.2020	1,854	7,108	383%	44
non-COVID-19	Human Development Index (HDI), 2018	0.77	0.13	17%	0.80
	Human freedom (Score), 2017	7.12	0.97	14%	6.93
	Population density, 2018	226	784	346%	83
	Population, 2018	55,084,185	186,378,908	338%	10,629,928
	Median age, 2020	33	8	26%	33
	GDP per capita, 2018	18,516	21,767	118%	9,273
	International tourism, number of arrivals, 2018	11,392,046	17,335,566	152%	3,939,000
	Air transport, passengers carried, 2018	37,002,028	106,311,359	287%	5,365,261

Source: authors.

In order to investigate the common features of COVID-19 highly infected countries, a non-hierarchical clustering analysis based on k-means method will be used. In the analysis standardized values of the observed variables will be used. In that way, all variables will be given in the same units. In order to identify the optimum number of clusters the two-step cluster procedure was applied. The automatic selection of the cluster number was chosen by according to the Schwarz's Bayesian Information Criterion (BIC) with the log-likelihood distance measure. Overall, six optimum number of clusters were performed. In all six analyses all non-COVID 19 variables were included plus one COVID 19 variable (related either to the total cases or the total deaths on certain date). The results are given in the Table 2.

Table 2. The optimum number of clusters, Schwarz's Bayesian Information Criterion, eight non-COVID 19 variables and one COVID-19 variable

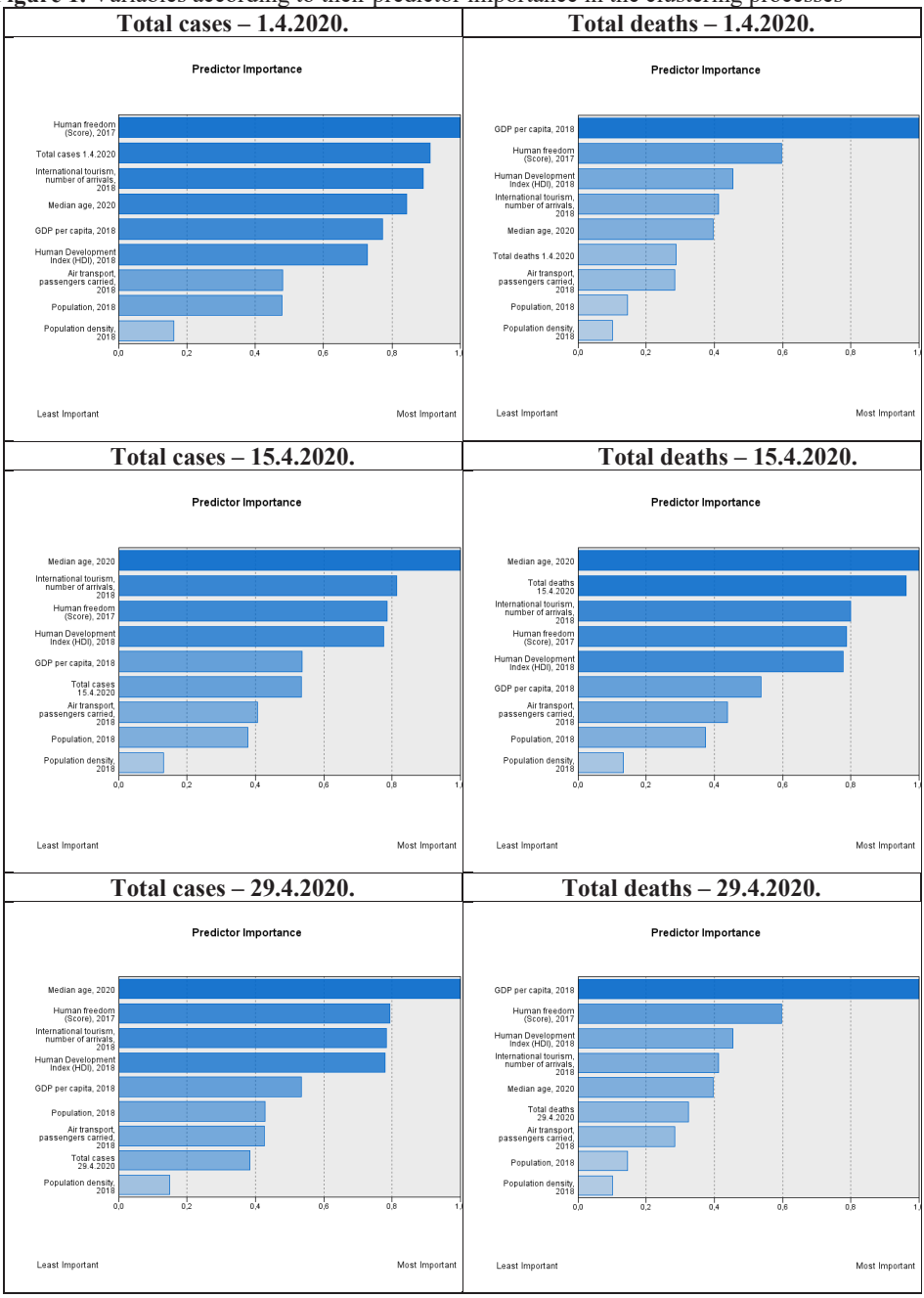
COVID-19 variable	Date		
	April 1, 2020	April 15, 2020	April 29, 2020
Total cases	3	3	3
Total deaths	2	3	2

Source: authors.

According to Table 2 in most cases the optimum number of clusters is three. However, the cluster quality ranges from fair to good. In the further analysis, the predictor importance of the variables in the clustering process were observed. The results are shown in Figure 1.

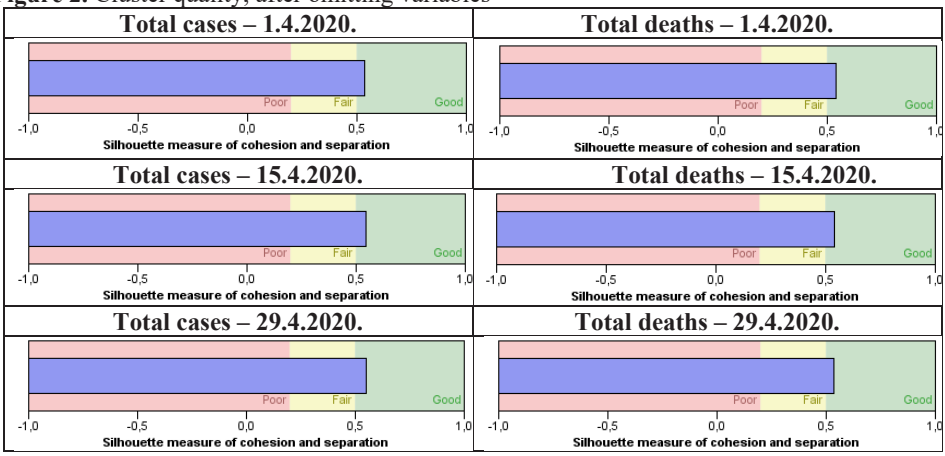
Figure 1 revealed that variables Population, Population density and Air transport, passengers carried have predictor importance level lower than 0.5 in all six cases. Therefore, in order to increase cluster quality those three variables will be omitted from the further analysis and the clustering will be conduct without them.

Figure 1. Variables according to their predictor importance in the clustering processes



Source: authors.

Figure 2. Cluster quality, after omitting variables



Source: authors.

In Figure 2 new cluster quality levels after omitting the three non-COVID-19 variables are shown. Now the cluster quality is good for all six cases. However, after the change of the number of variables included in clustering, at some cases the optimum number of clusters changed as well. In Table 3 the new optimum number of clusters for the six observed cases is given.

Table 3. The optimum number of clusters, Schwarz's Bayesian Information Criterion, five non-COVID 19 variables and one COVID-19 variable

COVID-19 variable	Date		
	April 1, 2020	April 15, 2020	April 29, 2020
Total cases	3	2	2
Total deaths	3	3	3

Source: authors.

The aim of the study was to identify the important factors that affect the transmission of COVID-19 disease in countries. Therefore, the optimum number of clusters is identified. Despite the results given in Table 3 indicating two or three optimum clusters for total cases variable, it has been decided that in all six cases only solutions with three clusters will be observed. In that way it will be possible to compare solutions in different days. The research hypothesis is that there should not be any significant changes in cluster memberships between the observed days.

4. RESULTS AND DISCUSSION

In Table 4 the number of countries in each cluster for the COVID-19 variables is given. There are overall 111 countries worldwide included in all clusters.

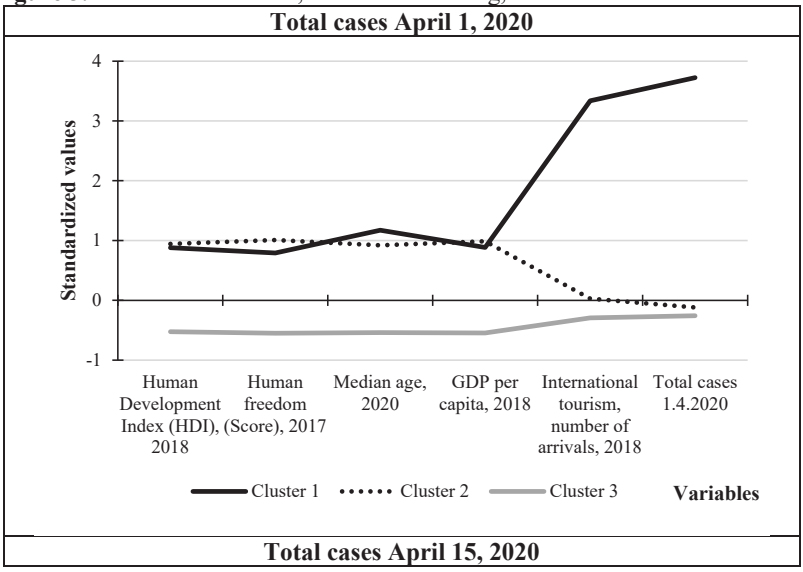
Table 4. The number of countries in the clusters, k-means clustering

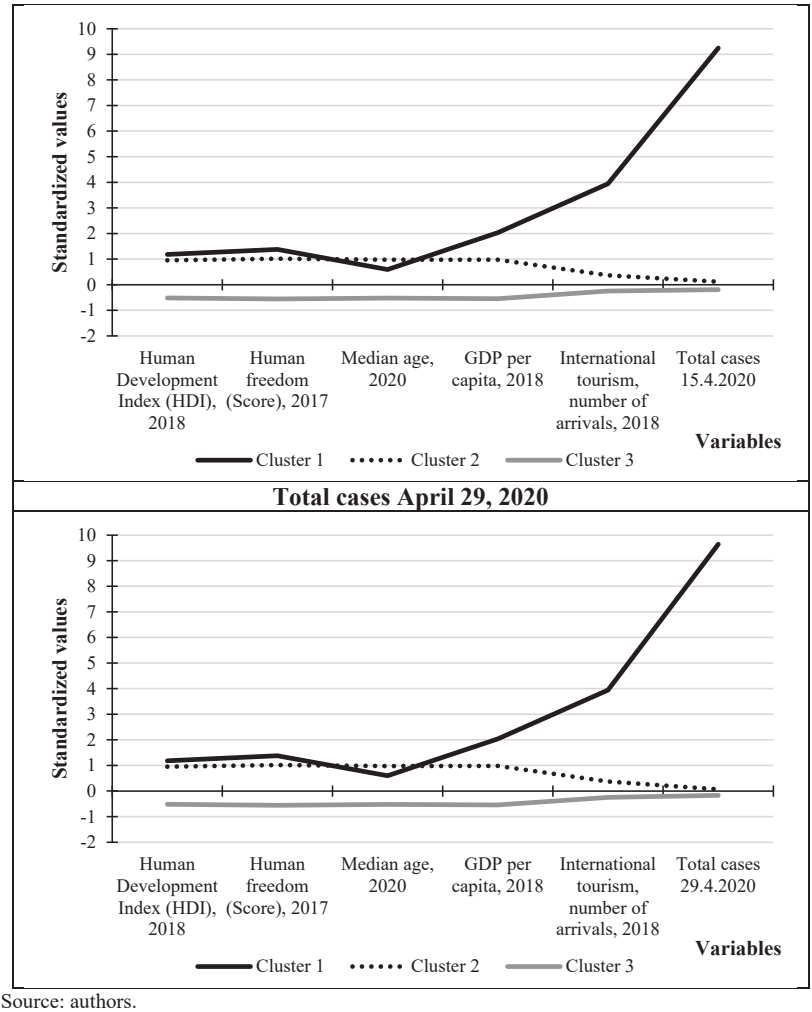
COVID-19 variable	Cluster 1	Cluster 2	Cluster 3
Total cases 1.4.2020	6	34	71
Total cases 15.4.2020	1	38	72
Total cases 29.4.2020	1	38	72
Total deaths 1.4.2020	5	35	71
Total deaths 15.4.2020	5	34	72
Total deaths 29.4.2020	5	34	72

Source: authors.

According to Table 4 there were no huge differences in the number of countries across the cluster. The only larger difference is present for variable total cases. In the Cluster 1 there were six countries (China, France, Germany, Italy, Spain, the United States of America) for the variable total cases on April 1, 2020. However, only the United States of America has left in the Cluster 1 on April 15 and April 29, 2020 due to increased number of confirmed cases of COVID-19 infection in the period after April 1st 2020. France, Germany, Italy and Spain moved to the Cluster 2 whereas China moved to the Cluster 3. Regarding the total deaths variable clustering, there were slight changes. China moved from the Cluster 1 on April 1, 2020 to the Cluster 3 on April 15 and April 29, 2020. Similar, the United Kingdom moved from the Cluster 2 on April 1, 2020 to the Cluster 1 on April 15 and April 29, 2020. The full list of countries according to the clusters is given in Appendix in Table A1. Also, in Appendix in Tables A2–A7 are shown the analysis of variance (ANOVA) tables for conducted k-means clustering.

Figure 3. Final cluster centres, k-means clustering, total cases

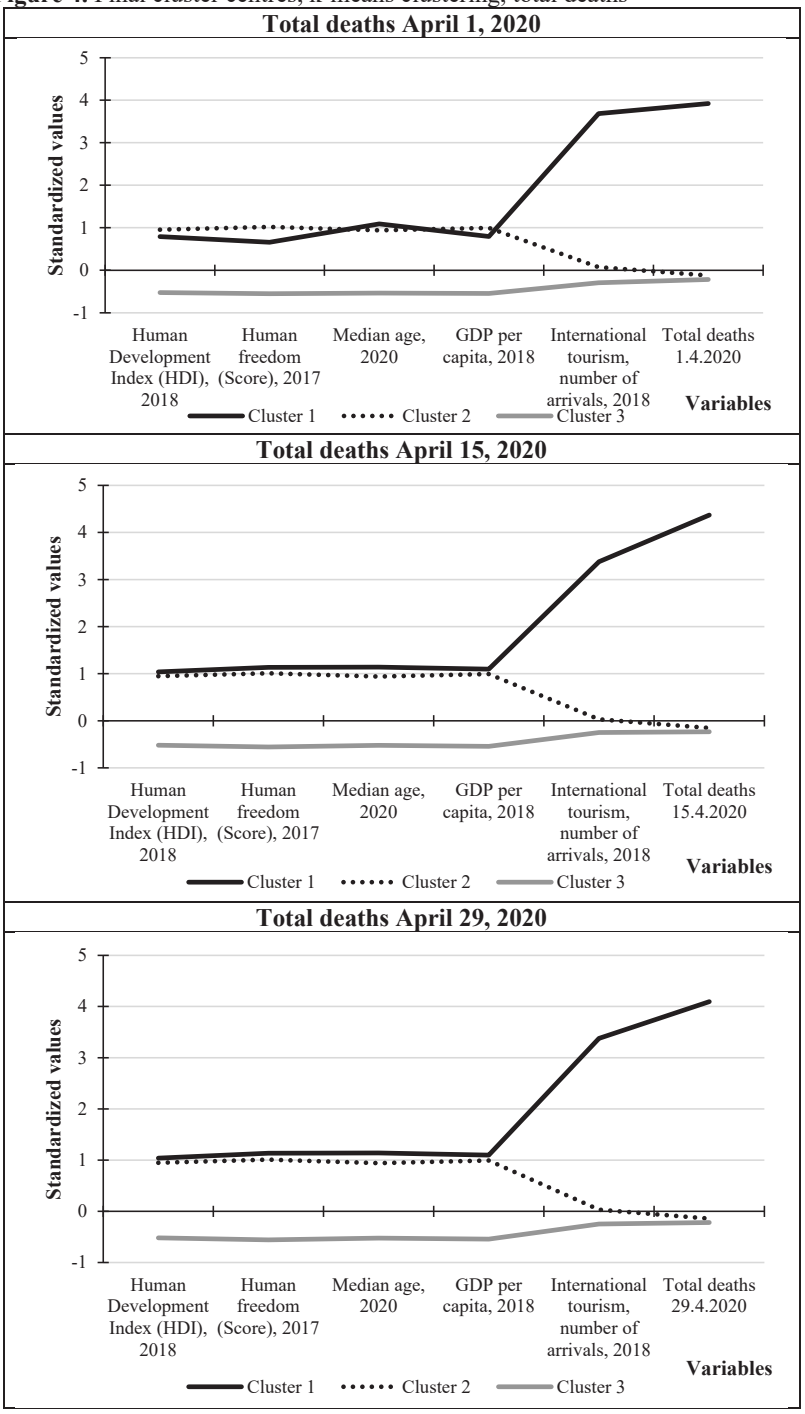




Source: authors.

In Figure 3 the final cluster centres for the total cases calculated by using k-means clustering on April 1, on April 15 and April 29, 2020 are shown. The lines in Figure 3 are representing average standardized value (z-score) of countries in a certain cluster. All three k-means clustering analysis of total cases are pointing out to the same conclusion that on average countries in the Cluster 1 and in the Cluster 2 have about the same Human Development Index (HDI), 2018; Human freedom (Score), 2017; and Median age, 2020. However, on average, countries in the Cluster 1 have a little bit higher GDP per capita, 2018 than the countries in the Cluster 2. Furthermore, the countries in the Cluster 1 have on average considerably higher International tourism, number of arrivals, 2018 and total cases values on all three dates than the countries in the Cluster 2 and in the Cluster 3. Countries in the Cluster 3 have the lowest average values for all observed variables.

Figure 4. Final cluster centres, k-means clustering, total deaths



Source: authors.

In Figure 4 the final cluster centres for the total deaths variable calculated by using k-means clustering on April 1, April 15 and April 29, 2020 are shown. Again, the lines in Figure 4 are showing the average standardized value of countries in certain cluster for each observed variable. The conclusions are consistent on all three dates and are quite similar to the conclusions made for Total cases variable. Here on average countries in the Cluster 1 and Cluster 2 have about the same Human Development Index (HDI), 2018; Human freedom (Score), 2017; and Median age, 2020 as for the Total cases variable. However, countries in the Cluster 1 and in the Cluster 2 have on average similar GDP per capita, 2018 as well. The countries in the Cluster 1 have on average convincingly the highest values of International tourism, number of arrivals, 2018 and total deaths in compare to the countries in the Cluster 2 and in the Cluster 3. Countries in the Cluster 3 have the lowest average values for all observed variables. However, on average countries in the Cluster 2 and in the Cluster 3 have almost equal value of total deaths on all three observed days.

From the aforementioned results of the analysis it can be concluded that countries with the most cases of infection and fatalities due to COVID-19 disease (Cluster 1 and 2) have the relatively higher values of Human Development Index (HDI), Human Freedom Score, have higher median age or older population, have higher values of GDP per capita and the number of arrivals of international tourists than countries in Cluster 3. Furthermore, countries in the Cluster 1 have a little bit higher GDP per capita values than countries in Cluster 2. Important finding is that countries in Cluster 1 have on average considerably higher number of arrivals from international tourism for both total cases and fatalities on all three dates than the countries in the Cluster 2 and Cluster 3. This is understandable because spread of COVID-19 disease was accelerated through the international travel and tourism activities and social interaction. This caused a tremendous pressure on international travel and tourism operations including airline industry, Ranasinghe et al. Results obtained from this study are comparable with other investigation in this field of research mentioned in the introduction and literature review part. Countries with higher values of Human Development Index, Human Freedom (Score), GDP, median age and have relatively higher number of international tourist arrivals are more susceptible to the transmission risk of COVID-19 disease.

5. CONCLUSIONS

Goal of paper was to investigate the common features of COVID-19 highly infected countries using the k-means cluster analysis. The purpose of this clustering was to divide variables into a number of clusters with similar data characteristics. In that way a common characteristics of COVID-19 highly infected countries could be observed. The results of the analysis have shown that common features of highly infected countries grouped in Clusters 1 and 2 are higher values of Human Development Index (HDI), Human Freedom Score, median age, GDP per capita and the number of arrivals of international tourists than countries with less cases of infection grouped in Cluster 3. Another important finding from this study is that COVI-19 highly infected countries have on average considerably higher number of arrivals from international tourism than the countries in Clusters 2 and 3.

Limitation of the paper is related to the fact that not all the non-COVID-19 variables are related to the same year because data for non-COVID-19 variables were not available for the year 2020 but were provided for the most recent year. Furthermore, the application of the non-hierarchical clustering analysis based on the k-means method pretermitted the examination of variable significance present in the regression models. Recommendations for future research could go in the way of other variables inclusion into investigation on different sample of countries and various time periods. Results obtained from this analysis have important policy

implications for economic and health care policy makers indicating that developed, tourism-oriented countries with elderly structure of population and improved human rights and freedom index are more vulnerable to the risk of COVID-19 contagion.

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APPENDIX

Table A1. Cluster membership, k-means clustering

Case no.	Country	Total cases 1.4.2020	Total cases 15.4.2020	Total cases 29.4.2020	Total deaths 1.4.2020	Total deaths 15.4.2020	Total deaths 29.4.2020
1	Albania	3	3	3	3	3	3
2	Algeria	3	3	3	3	3	3
3	Angola	3	3	3	3	3	3
4	Argentina	3	3	3	3	3	3
5	Australia	2	2	2	2	2	2
6	Austria	2	2	2	2	2	2
7	Azerbaijan	3	3	3	3	3	3
8	Bahamas	2	2	2	2	2	2
9	Bahrain	3	3	3	3	3	3
10	Belarus	3	3	3	3	3	3
11	Belgium	2	2	2	2	2	2
12	Belize	3	3	3	3	3	3
13	Bhutan	3	3	3	3	3	3
14	Bolivia	3	3	3	3	3	3
15	Brazil	3	3	3	3	3	3
16	Brunei Darussalam	3	3	3	3	3	3
17	Bulgaria	2	2	2	2	2	2
18	Burkina Faso	3	3	3	3	3	3
19	Cambodia	3	3	3	3	3	3
20	Canada	2	2	2	2	2	2
21	Cape Verde	3	3	3	3	3	3
22	Chile	2	2	2	2	2	2
23	China	1	3	3	1	3	3
24	Colombia	3	3	3	3	3	3
25	Congo	3	3	3	3	3	3
26	Costa Rica	3	3	3	3	3	3
27	Cote dIvoire	3	3	3	3	3	3
28	Croatia	2	2	2	2	2	2
29	Cyprus	2	2	2	2	2	2
30	Czechia	2	2	2	2	2	2
31	Ecuador	3	3	3	3	3	3
32	Egypt	3	3	3	3	3	3
33	El Salvador	3	3	3	3	3	3
34	Estonia	2	2	2	2	2	2
35	Ethiopia	3	3	3	3	3	3
36	Fiji	3	3	3	3	3	3
37	Finland	2	2	2	2	2	2
38	France	1	2	2	1	1	1
39	Gambia	3	3	3	3	3	3
40	Georgia	3	3	3	3	3	3
41	Germany	1	2	2	2	2	2
42	Greece	2	2	2	2	2	2
43	Guatemala	3	3	3	3	3	3
44	Guyana	3	3	3	3	3	3
45	Hungary	2	2	2	2	2	2
46	Iceland	2	2	2	2	2	2
47	India	3	3	3	3	3	3
48	Indonesia	3	3	3	3	3	3
49	Ireland	2	2	2	2	2	2
50	Israel	2	2	2	2	2	2
51	Italy	1	2	2	1	1	1
52	Jamaica	3	3	3	3	3	3
53	Japan	2	2	2	2	2	2
54	Jordan	3	3	3	3	3	3

55	Kazakhstan	3	3	3	3	3	3
56	Kuwait	3	3	3	3	3	3
57	Kyrgyzstan	3	3	3	3	3	3
58	Laos	3	3	3	3	3	3
59	Latvia	2	2	2	2	2	2
60	Lebanon	3	3	3	3	3	3
61	Lithuania	2	2	2	2	2	2
62	Luxembourg	2	2	2	2	2	2
63	Madagascar	3	3	3	3	3	3
64	Malawi	3	3	3	3	3	3
65	Malaysia	3	3	3	3	3	3
66	Malta	2	2	2	2	2	2
67	Mauritius	3	3	3	3	3	3
68	Mexico	3	3	3	3	3	3
69	Moldova	3	3	3	3	3	3
70	Mongolia	3	3	3	3	3	3
71	Montenegro	3	3	3	3	3	3
72	Morocco	3	3	3	3	3	3
73	Mozambique	3	3	3	3	3	3
74	Myanmar	3	3	3	3	3	3
75	Nepal	3	3	3	3	3	3
76	Netherlands	2	2	2	2	2	2
77	New Zealand	2	2	2	2	2	2
78	Oman	3	3	3	3	3	3
79	Panama	3	3	3	3	3	3
80	Papua New Guinea	3	3	3	3	3	3
81	Paraguay	3	3	3	3	3	3
82	Peru	3	3	3	3	3	3
83	Philippines	3	3	3	3	3	3
84	Poland	2	2	2	2	2	2
85	Portugal	2	2	2	2	2	2
86	Qatar	2	2	2	2	2	2
87	Romania	2	2	2	2	2	2
88	Russia	3	3	3	3	3	3
89	Saudi Arabia	3	3	3	3	3	3
90	Serbia	3	3	3	3	3	3
91	Seychelles	3	3	3	3	3	3
92	Singapore	2	2	2	2	2	2
93	Slovenia	2	2	2	2	2	2
94	South Africa	3	3	3	3	3	3
95	South Korea	2	2	2	2	2	2
96	Spain	1	2	2	1	1	1
97	Sri Lanka	3	3	3	3	3	3
98	Switzerland	2	2	2	2	2	2
99	Thailand	3	3	3	3	3	3
100	Togo	3	3	3	3	3	3
101	Trinidad and Tobago	3	3	3	3	3	3
102	Tunisia	3	3	3	3	3	3
103	Turkey	3	3	3	3	3	3
104	Ukraine	3	3	3	3	3	3
105	United Arab Emirates	2	2	2	2	2	2
106	United Kingdom	2	2	2	2	1	1
107	United Republic of Tanzania	3	3	3	3	3	3
108	United States of America	1	1	1	1	1	1
109	Vietnam	3	3	3	3	3	3
110	Zambia	3	3	3	3	3	3
111	Zimbabwe	3	3	3	3	3	3

Source: authors.

Table A2. Analysis of variance (ANOVA) table, k-means clustering, total cases April 1, 2020

Variable	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
Human Development Index (HDI), 2018	27.235	2	0.514	108	52.969	<0.001
Human freedom (Score), 2017	29.917	2	0.464	108	64.408	<0.001
Median age, 2020	28.800	2	0.485	108	59.359	<0.001
GDP per capita, 2018	29.470	2	0.473	108	62.334	<0.001
International tourism, number of arrivals, 2018	36.458	2	0.343	108	106.173	<0.001
Total cases 1.4.2020	44.213	2	0.200	108	221.339	<0.001

Source: authors.

Table A3. Analysis of variance (ANOVA) table, k-means clustering, total cases April 15, 2020

Variable	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
Human Development Index (HDI), 2018	27.647	2	0.507	108	54.581	<0.001
Human freedom (Score), 2017	31.737	2	0.431	108	73.668	<0.001
Median age, 2020	28.069	2	0.499	108	56.281	<0.001
GDP per capita, 2018	30.942	2	0.446	108	69.449	<0.001
International tourism, number of arrivals, 2018	12.603	2	0.785	108	16.052	<0.001
Total cases 15.4.2020	44.357	2	0.197	108	225.049	<0.001

Source: authors.

Table A4. Analysis of variance (ANOVA) table, k-means clustering, total cases April 29, 2020

Variable	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
Human Development Index (HDI), 2018	27.647	2	0.507	108	54.581	<0.001
Human freedom (Score), 2017	31.737	2	0.431	108	73.668	<0.001
Median age, 2020	28.069	2	0.499	108	56.281	<0.001
GDP per capita, 2018	30.942	2	0.446	108	69.449	<0.001
International tourism, number of arrivals, 2018	12.603	2	0.785	108	16.052	<0.001
Total cases 29.4.2020	47.626	2	0.137	108	348.745	<0.001

Source: authors.

Table A5. Analysis of variance (ANOVA) table, k-means clustering, total deaths April 1, 2020

Variable	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
Human Development Index (HDI), 2018	27.283	2	0.513	108	53.154	<0.001
Human freedom (Score), 2017	30.083	2	0.461	108	65.196	<0.001
Median age, 2020	28.689	2	0.487	108	58.882	<0.001
GDP per capita, 2018	29.533	2	0.472	108	62.623	<0.001
International tourism, number of arrivals, 2018	37.113	2	0.331	108	112.044	<0.001
Total deaths 1.4.2020	40.387	2	0.271	108	149.241	<0.001

Source: authors.

Table A6. Analysis of variance (ANOVA) table, k-means clustering, total deaths April 15, 2020

Variable	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
Human Development Index (HDI), 2018	27.640	2	0.507	108	54.553	<0.001
Human freedom (Score), 2017	31.706	2	0.431	108	73.501	<0.001
Median age, 2020	28.086	2	0.498	108	56.352	<0.001
GDP per capita, 2018	30.423	2	0.455	108	66.844	<0.001
International tourism, number of arrivals, 2018	30.779	2	0.449	108	68.623	<0.001
Total deaths 15.4.2020	50.073	2	0.091	108	548.824	<0.001

Source: authors.

Table A7. Analysis of variance (ANOVA) table, k-means clustering, total deaths April 29, 2020

Variable	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
Human Development Index (HDI), 2018	27.640	2	0.507	108	54.553	<0.001
Human freedom (Score), 2017	31.706	2	0.431	108	73.501	<0.001
Median age, 2020	28.086	2	0.498	108	56.352	<0.001
GDP per capita, 2018	30.423	2	0.455	108	66.844	<0.001
International tourism, number of arrivals, 2018	30.779	2	0.449	108	68.623	<0.001
Total deaths 29.4.2020	44.001	2	0.204	108	216.033	<0.001

Source: authors.

RETAIL RESPONSE TO COVID-19 PANDEMIC

DEPENDENCE STRUCTURE OF RETURNS AND TRADING STRATEGIES ON CRYPTOCURRENCIES MARKET: QUANTILE AUTOREGRESSION APPROACH

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Abstract

This paper follows quantile autorregression approach to examine dependence structure of daily returns for nine cryptocurrencies, namely Neo, Ripple, LiteCoin, Cardano, Zcash, Dash, DogeCoin, Waves and Ethereum. The research results from this paper reject efficient market hypothesis in most of the considered cases, except in the cases of Zcash and Waves. Based on the empirical findings herein, we derived trading strategy for each of the considered cryptocurrencies. The one trading strategy is appropriate for Neo, Ripple, DogeCoin and Ethereum. Investors in LiteCoin and Dash should follow the other trading strategy while investors in Cardano should implement the third. In line with efficient market hypothesis returns on Zcash and Waves were not predictable.

Keywords: cryptocurrencies, dependence structure, market efficiency, quantile dependence.

1. INTRODUCTION

In recent years, cryptocurrency market has experienced a huge development in terms of its market capitalization and number of cryptocurrencies as well. Increasing significance of the market attracted attention of investors, traders and scholars from all over the globe. Many different empirical approaches have been tested to reveal characteristics of cryptocurrency market. However, most of the researchers studied BitCoin as the leading and the most prominent cryptocurrency.

This paper takes into account a wider set of nine cryptocurrencies and makes a step towards deeper understanding of dynamics on cryptocurrency market. The research herein observes daily returns on cryptocurrencies i.e. series of financial returns. Empirical properties of financial series are well known and frequently documented as non-normally distributed and heteroscedastic with clusters of volatilities. While bearing in mind efficient market hypothesis and consistently with the empirical properties this paper follows quantile autoregression approach from Koenker and Xiao (2004, 2006) to examine dependence structure of returns on nine cryptocurrencies. Based on the empirical results from this research, the paper derives trading strategy for each of the cryptocurrency from the sample.

The rests of this paper is organized as follows: section 2 briefly summarizes existing literature closely related to the topic of cryptocurrencies. Section 3 provides research data and employed methodology, while Section 4 gives Empirical results and discussion. The final section summarizes the main findings of the research.

2. BRIEF LITERATURE OVERVIEW

Caporale et al. (2018) employed R/S analysis and fractional integration to examine persistence of the four cryptocurrencies (BitCoin, LiteCoin, Ripple, Dash) over the sample period 2013–2017. The research results suggest existence of persistence with a positive correlation between its past and future prices pointing out an inefficiency of cryptocurrencies market.

Khuntia and Pattanayak (2018) studied the case of bitcoin and suggest that market efficiency evolves over time while supporting adaptive market hypothesis. Kyriazis (2019) provided extensive literature overview and found that majority of academic papers supported inefficiency of Bitcoin and other digital currencies but large steps towards efficiency during the recent years have been recorded as well. Vidal-Tomás et al. (2019) studied existence of herding in the cryptocurrencies market and found extreme dispersion of returns explained with rational asset pricing models. The results revealed herding during downturn of the markets pointing out inefficiency and risk in cryptocurrencies market. Fry and Cheah (2016) found a considerable speculative component and volatilities of high extremes in cryptocurrency markets. Li and Wang (2017) studied determinants of exchange rate of Bitcoin against USD and found economic fundamentals and market conditions as the short run determinants.

Caporale and Plastun (2019) examined overreactions in the cryptocurrency market while considering trading strategies and pointed out no profitable trading strategies. Borri (2019), Pointed out that portfolios of cryptocurrencies outperform individual cryptocurrencies in terms of risk-adjusted and conditional returns. Bouri et al. (2019) studied exponential price spikes or price explosivity within cryptocurrency market and found multiple explosivity such as explosivity in one cryptocurrency leads to explosivity in other cryptocurrencies. Furthermore, the results illustrated a multidirectional co-explosivity rom bigger to smaller markets and more importantly vice versa, co-explosivity was illustrated as well. Shen et al. (2019) used linear and nonlinear Granger causality tests, found the number of tweets as a significant driver of next day trading volume and realized volatility as well. ElBahrawy et al. (2017) found the number of active cryptocurrencies, market share distribution and the turnover of cryptocurrencies stable for years while pointing out neutral model of evolution as being capable to reproduce key empirical observations. Zhang et al.(2018) provided stylized facts for cryptocurrency market pointed out existence of heavy tails in distribution of returns on cryptocurrencies, quick decay in autocorrelations of returns, volatility clustering, leverage effects and law correlation between price and volume.

As illustrated in literature overview, the research results from contemporary literature are ambiguous. The research results always depend on data selection and model specification. This paper contributes to the discussion with results from quantile autoregression while suggesting trading strategies for nine cryptocurrencies.

3. RESEARCH DATA AND METHODOLOGY

The data sample consists of daily data for closing price. Depending on data availability, time span differs for some cryptocurrencies. The time span for each of the nine considered cryptocurrencies is provided in Table A1 in the Appendix. Descriptive statistics for each cryptocurrency in its (natural) log values is provided in Table A2 in the Appendix. We firstly employ a number of standard unit root tests:Augmented Dickey-Fuller (1979) (ADF test), the Generalized Least Squares Dickey-Fuller test (DF-GLS) test developed by Elliot et al. (1996) (ERS test) Kwiatkowski et al. (1992) (KPSS test) and Phillips–Perron (1988) (PP test), Results from unit root test are summarized in Table A3 in the appendix. Afterwards, we consistently examined dependence structure of log returns using herein described methodology.

In case of observed time series y_t AR(1) process can be described in equation (1):

$$\boldsymbol{y_t = \alpha + \beta \cdot y_{t-1} + \varepsilon_t} \quad (1)$$

where ε_t in equation (1) presents serially uncorrelated residual term or endogenous shocks. Following Quantile Autoregression (QAR) approach from Koenker and Xiao (2004, 2006) one can estimate quantile dependent autoregression coefficient and provide deeper insights in dependence structure of autoregression coefficients across different quantiles. AR(1) process at quantile τ is presented in equation (2):

$$\boldsymbol{Q_{y_t}(\tau|y_{t-1}) = \alpha(\tau) \cdot y_{t-1} + \varepsilon(\tau)} \quad (2)$$

where: $Q_{y_t}(\tau|y_{t-1})$ provides the τ-th conditional quantile of the observed series, $\varepsilon(\tau)$ presents τ-th quantile of an endogenous shocks and $\alpha(\tau)$ denotes autoregressive coefficient for each quantile (τ), Consequently, $\varepsilon(\tau)$ provides information about sign and magnitude of endogenous shock within observed time series while $\alpha(\tau)$ illustrates dependence structure across observed quantiles of endogenous shocks. The standard errors are calculated using the Hall-Sheather bandwidth rule while presuming local (in quantile) linearity of the conditional quantile functions. More details are provided in Koenker and Xiao (2004), Recent application of quantile auto regression was illustrated in Kuck et al. (2015), Kuck and Maderitsch (2019) Bošnjak et al. (2019),

4. RESEARCH RESULTS AND DISCUSSIONS

Following descriptive statistics in Table A2 and consistently with previous studies illustrated in literature overview section of this paper, there is no empirical support for normal distribution. Standard unit root test results in Table A3 unambiguously indicate nonstationary variables at its levels but stationary in its first differences. Therefore, we directed our attention towards variables in first differences and provide results for (natural) log returns of the considered cryptocurrencies.

The proper empirical approach in case of non-normality distribution to examine dependence structure of returns might be quantile autoregression. While using the quantile autoregression constancy of autoregression coefficients across quantiles is relaxed. In line with illustrated data and methodology. Table 1 summarizes estimates for returns on Neo.

Table 1. Quantile autoregression of NEO returns

	$\varepsilon(\tau)$			$\alpha(\tau)$		
Quantile	Estimates	t-statistic	p-value	Estimates	t-statistic	p-value
0.10	- 0.08976 (0.00651)	- 13.78228	0.00000	- 0.06179 (0.03475)	- 1.77805	0.07577
0.20	- 0.05341 (0.00344)	- 15.52447	0.00000	- 0.06740 (0.02823)	- 2.38786	0.01717
0.30	- 0.03502 (0.00290)	- 12.06265	0.00000	- 0.08589 (0.02865)	- 2.99807	0.00280
0.40	- 0.01651 (0.00260)	- 6.34529	0.00000	- 0.07966 (0.02537)	- 3.14046	0.00175
0.50	- 0.00510 (0.00229)	- 2.23062	0.02598	- 0.07688 (0.02037)	- 3.77443	0.00017
0.60	0.00946 (0.00292)	3.24400	0.00123	- 0.04429 (0.03032)	- 1.46066	0.14450
0.70	0.02881 (0.00387)	7.44014	0.00000	0.02246 (0.03676)	0.61109	0.54131
0.80	0.05396 (0.00526)	10.25842	0.00000	0.12569 (0.03807)	3.30124	0.00100
0.90	0.10292 (0.00752)	13.69469	0.00000	0.18384 (0.06527)	2.81639	0.00497

Source: own estimates

As illustrated in Table 1, negative endogenous shocks in Neo returns were followed by positive returns and positive endogenous shocks in Neo returns of higher magnitude were followed by positive returns. Therefore, dependence structure of returns on Neo suggest rejection of the efficient market hypothesis and trading strategy for Neo would be buy and hold when price starts to increase. However, in cases of decline of the price, active trading strategy is required i.e. when the price decline investor should buy Neo and sell it in the following day. Similarly, the estimates for Ripple were obtained and illustrated in Table 2.

Table 2. Quantile autoregression of Ripple returns

	$\varepsilon(\tau)$			$\alpha(\tau)$		
Quantile	Estimates	t-statistic	p-value	Estimates	t-statistic	p-value
0.10	- 0.05902 (0.00315)	- 18.75120	0.00000	- 0.03273 (0.04278)	- 0.76522	0.44423
0.20	- 0.03277 (0.00169)	- 19.37215	0.00000	- 0.06137 (0.02300)	- 2.66814	0.00769
0.30	- 0.01740 (0.00111)	-15.71310	0.00000	-0.05739 (0.01468)	- 3.90996	0.00010
0.40	- 0.00943 (0.00078)	- 12.14780	0.00000	- 0.03247 (0.00983)	- 3.30487	0.00097
0.50	- 0.00282 (0.00078)	- 3.62373	0.00030	- 0.01137 (0.01055)	- 1.07795	0.28118
0.60	0.00485 (0.00090)	5.39576	0.00000	- 0.00152 (0.01050)	- 0.14485	0.88485
0.70	0.01445 (0.00127)	11.37299	0.00000	0.01172 (0.00920)	1.27312	0.20312
0.80	0.03025 (0.00183)	16.54108	0.00000	0.08254 (0.02381)	3.46738	0.00054
0.90	0.06490 (0.00408)	15.92137	0.00000	0.15379 (0.03885)	3.95865	0.00008

Source: own estimates

Following the estimates in Table 2 and similarly to estimates for Neo cryptocurreny, negative returns on Ripple were mostly followed by positive returns with exception of negative endogenous shocks of the highest magnitude. Positive returns of the highest magnitude were followed by positive returns. Furthermore, returns around the median were in line with the efficient market hypothesis. The suggested trading strategy based on the estimates from Table 2 would the same as in case of Neo, to buy and hold when price starts to increase or buy and sell it in the following day when price declines. The estimates for LiteCoin are provided in Table 3.

Table 3. Quantile autoregression of LiteCoin returns

	$\varepsilon(\tau)$			$\alpha(\tau)$		
Quantile	Estimates	t-statistic	p-value	Estimates	t-statistic	p-value
0.10	- 0.05492 (0.00279)	- 19.64958	0.00000	- 0.04550 (0.03999)	- 1.13768	0.25538
0.20	- 0.02806 (0.00165)	- 17.00290	0.00000	- 0.06494 (0.02497)	- 2.60100	0.00936
0.30	- 0.01449 (0.00104)	-13.99474	0.00000	- 0.06579 (0.01290)	- 5.09954	0.00000
0.40	- 0.00671 (0.00068)	- 9.82824	0.00000	- 0.07801 (0.00714)	- 10.92951	0.00000
0.50	- 0.00119 (0.00058)	- 2.04767	0.04071	- 0.09581 (0.00663)	- 14.44164	0.00000
0.60	0.00477 (0.00072)	6.60434	0.00000	- 0.09390 (0.01077)	- 8.71510	0.00000
0.70	0.01245 (0.00108)	11.48756	0.00000	- 0.05067 (0.01442)	- 3.51290	0.00045
0.80	0.02728 (0.00189)	14.47250	0.00000	- 0.01565 (0.01671)	- 0.93683	0.34895
0.90	0.05751 (0.00339)	16.98788	0.00000	0.07387 (0.05422)	1.36259	0.17316

Source: own estimates

As presented in Table 3, the autoregression coefficients in cases of negative shocks were negative and significant except in case of negative shocks of the highest magnitude. Therefore and similarly to the cases of Neo and Ripple, negative returns on LiteCoin were followed by positive returns. However, in cases of positive endogenous shocks trading strategy differs from trading strategies for Neo and Ripple. Trading with LiteCoin should follow active trading strategies and investor should buy LiteCoin only in case of decline of the price and sell it in the following day. Investors should not buy the LiteCoin in cases of increase in price since in the following day the price is expected to decline. The estimates for returns on Cardano are summarized in Table 4.

The estimates in Table 4 illustrates that autoregression coefficients were positive across all quantiles. However, the coefficient at the highest positive quantile representing positive endogenous shocks was insignificant as well as at the two lowest quantiles representing negative endogenous shocks of the highest magnitude. The suggested trading strategy for investors in Cardano appears to buy when price increases since it will continue to increase and hold until the price starts to decline. When price starts to declines since it will continue to decline.

Table 4. Quantile autoregression of CARDANO returns

	$\varepsilon(\tau)$			$\alpha(\tau)$		
Quantile	Estimates	t-statistic	p-value	Estimates	t-statistic	p-value
0.10	- 0.01416 (0.00208)	- 6.79623	0.00000	0.05331 (0.06353)	0.83912	0.40179
0.20	- 0.00653 (0.00102)	- 6.36973	0.00000	0.03931 (0.03682)	1.06781	0.28611
0.30	- 0.00291 (0.00053)	- 5.53060	0.00000	0.10482 (0.03575)	2.93192	0.00352
0.40	- 0.00136 (0.00030)	- 4.46931	0.00001	0.10543 (0.01167)	9.03659	0.00000
0.50	- 0.00035 (0.00023)	- 1.51050	0.13153	0.10204 (0.00970)	10.51649	0.00000
0.60	0.00069 (0.00024)	2.89913	0.00390	0.09356 (0.00936)	9.99793	0.00000
0.70	0.00173 (0.00039)	4.44795	0.00001	0.08987 (0.00960)	9.36539	0.00000
0.80	0.00448 (0.00085)	5.27984	0.00000	0.08579 (0.02347)	3.65529	0.00028
0.90	0.01188 (0.00258)	4.59881	0.00001	0.06094 (0.09469)	0.64354	0.52016

Source: own estimates

The estimates for Zcash are given in Table 5.

Table 5. Quantile autoregression of Zcash returns

	$\varepsilon(\tau)$			$\alpha(\tau)$		
Quantile	Estimates	t-statistic	p-value	Estimates	t-statistic	p-value
0.10	- 0.08723 (0.00572)	- 15.25165	0.00000	0.10717 (0.07483)	1.43228	0.15243
0.20	- 0.04937 (0.00353)	- 13.97395	0.00000	0.00540 (0.02746)	0.19655	0.84423
0.30	- 0.03051 (0.00254)	- 12.03195	0.00000	0.01138 (0.03228)	0.35244	0.72459
0.40	- 0.01497 (0.00219)	- 6.82121	0.00000	- 0.03403 (0.01823)	- 1.86644	0.06232
0.50	- 0.00487 (0.00193)	- 2.52105	0.01188	- 0.03501 (0.02046)	- 1.71101	0.08744
0.60	0.00779 (0.00227)	3.43147	0.00063	- 0.04024 (0.03185)	- 1.26322	0.20686
0.70	0.02136 (0.00283)	7.55890	0.00000	- 0.01163 (0.03898)	- 0.29840	0.76547
0.80	0.04225 (0.00363)	11.63215	0.00000	0.02243 (0.03416)	0.65660	0.51162
0.90	0.07625 (0.00597)	12.76743	0.00000	0.03555 (0.04342)	0.81876	0.41315

Source: own estimates

Following the estimates in Table 5, one can see that no one autoregression coefficient obtained desired level of significance. Therefore, returns on Zcash were in line with efficient market hypothesis and we could not predict the next day return out of previous returns. The estimates for Dash are presented in Table 6.

Table 6. Quantile autoregression of Dash returns

	$\varepsilon(\tau)$			$\alpha(\tau)$		
Quantile	Estimates	t-statistic	p-value	Estimates	t-statistic	p-value
0.10	- 0.06498 (0.00300)	- 21.68111	0.00000	- 0.09334 (0.04118)	- 2.26635	0.02355
0.20	- 0.03752 (0.00181)	- 20.73814	0.00000	- 0.05954 (0.01265)	- 4.70648	0.00000
0.30	- 0.02224 (0.00134)	- 16.55899	0.00000	- 0.07355 (0.01701)	- 4.32505	0.00002
0.40	- 0.01160 (0.00114)	- 10.20266	0.00000	- 0.04286 (0.01392)	- 3.07852	0.00211
0.50	- 0.00209 (0.00111)	- 1.88833	0.05914	- 0.03203 (0.01491)	- 2.14804	0.03184
0.60	0.00783 (0.00134)	5.84612	0.00000	- 0.01879 (0.01587)	- 1.18434	0.23643
0.70	0.02078 (0.00158)	13.13185	0.00000	- 0.00683 (0.01857)	- 0.36791	0.71298
0.80	0.03801 (0.00207)	18.33817	0.00000	0.01629 (0.02316)	0.70324	0.48199
0.90	0.07402 (0.00430)	17.21667	0.00000	0.03404 (0.04381)	0.77718	0.43716

Source: own estimates

The results in Table 6 illustrates significant autoregression coefficients for negative endogenous shocks only. Therefore, investors could make a profit only if invested when the price of Dash was declining and liquidating the position in following day. The estimated results for DogeCoin returns are summarized in Table 7.

Table 7. Quantile autoregression of DogeCoin returns

	$\varepsilon(\tau)$			$\alpha(\tau)$		
Quantile	Estimates	t-statistic	p-value	Estimates	t-statistic	p-value
0.10	- 0.06390 (0.00338)	- 18.93239	0.00000	- 0.08486 (0.04299)	- 1.97406	0.04852
0.20	- 0.03399 (0.00185)	- 18.41740	0.00000	- 0.09274 (0.02384)	- 3.88932	0.00010
0.30	- 0.02012 (0.00114)	- 17.61254	0.00000	- 0.06679 (0.01370)	- 4.87565	0.00000
0.40	- 0.01105 (0.00096)	- 11.47284	0.00000	- 0.05998 (0.01351)	- 4.43870	0.00001
0.50	- 0.00327 (0.00090)	- 3.64762	0.00027	- 0.04121 (0.01154)	- 3.57033	0.00037
0.60	0.00480 (0.00095)	5.02832	0.00000	- 0.04380 (0.01119)	- 3.91285	0.00009
0.70	0.01433 (0.00134)	10.67545	0.00000	- 0.01746 (0.01403)	- 1.24394	0.21368
0.80	0.03266 (0.00239)	13.66662	0.00000	0.07188 (0.03268)	2.19963	0.02795
0.90	0.06788 (0.00438)	15.50022	0.00000	0.12760 (0.06046)	2.11043	0.03495

Source: own estimates

Following the results in Table 7, investors in DogeCoin should buy the cryptocurrency when the price declines and sell it in the following day. Furthermore, when price starts to increase with higher magnitudes the strategy will be buy and hold. Therefore, two different

trading strategies are required for investors in DogeCoin depending of the direction of price. The estimates for Waves returns are illustrated in Table 8.

Table 8. Quantile autoregression of WAVES returns

	$\varepsilon(\tau)$			$\alpha(\tau)$		
Quantile	Estimates	t-statistic	p-value	Estimates	t-statistic	p-value
0.10	- 0.08043 (0.00564)	- 14.25337	0.00000	0.10511 (0.06893)	1.52491	0.12760
0.20	- 0.04602 (0.00316)	- 14.57728	0.00000	0.02319 (0.02805)	0.82661	0.40866
0.30	- 0 .02689 (0.00228)	- 11.80472	0.00000	- 0.02524 (0.02801)	- 0 .90091	0.36785
0.40	- 0.01376 (0.00211)	- 6 .50792	0.00000	- 0.03764 (0.02496)	- 1.50822	0.13181
0.50	- 0.00019 (0.00219)	- 0.08671	0.93092	- 0.01428 (0.00615)	- 2.32416	0.02032
0.60	0.01392 (0.00240)	5.81140	0.00000	0.01343 (0.02275)	0.59010	0.55526
0.70	0.02935 (0.00307)	9.55183	0.00000	0.05005 (0.03450)	1.45084	0.14714
0.80	0.05379 (0.00331)	16.25690	0.00000	0.03226 (0.03389)	0.95186	0.34140
0.90	0.08508 (0.00524)	16 .24100	0.00000	0.04947 (0.06249)	0.79170	0.42872

Source: own estimates

Out of the results in Table 8, only significant autoregression coefficient is the one for median regression. However, there is not meaningful conclusion for investors from median regression. The rests of the results in Table 8 support efficient market hypothesis. The estimated results for Ethereum returns are illustrated in Table 9.

Table 9. Quantile autoregression of Ethereum returns

	$\varepsilon(\tau)$			$\alpha(\tau)$		
Quantile	Estimates	t-statistic	p-value	Estimates	t-statistic	p-value
0.10	- 0.06390 (0.00338)	- 18.93239	0.00000	- 0.08486 (0.04299)	- 1.97406	0.04852
0.20	- 0.03399 (0.00185)	- 18.41740	0.00000	-0.09274 (0.02384)	- 3.88932	0.00010
0.30	- 0.02012 (0.00114)	- 17.61254	0.00000	- 0.06679 (0.01370)	- 4.87565	0.00000
0.40	- 0.01105 (0.00096)	- 11.47284	0.00000	- 0.05998 (0.01351)	- 4.43870	0.00001
0.50	- 0.00327 (0.00090)	- 3.64762	0.00027	- 0.04121 (0.01154)	- 3.57033	0.00037
0.60	0.00480 (0.00095)	5.02832	0.00000	- 0.04380 (0.01119)	- 3.91285	0.00009
0.70	0.01433 (0.00134)	10.67545	0.00000	- 0.01746 (0.01403)	- 1.24394	0.21368
0.80	0.03266 (0.00239)	13.66662	0.00000	0.07188 (0.03268)	2.19963	0.02795
0.90	0.06788 (0.00438)	15.50022	0.00000	0.12760 (0.06046)	2.11043	0.03495

Source: own estimates

The results in Table 9 suggest active trading strategies for negative price movements when the price decreases investors should buy the cryptocurrency and sell it in the following day. When the price starts to increase the suggested strategy is buy and hold. The results presented in this section point out different conclusions regarding market efficiency and suggest various trading strategies for different cryptocurrencies.

5. CONCLUDING REMARKS

The research results from this paper point out several conclusions. Firstly, efficient market hypothesis holds in two out of nine cryptocurrencies considered in this paper. Following empirical findings based on quantile autoregression approach the optimal trading strategy for Neo, Ripple, DogeCoin and Ethereum should be to buy when the price go down and sell in the following day. When prices go up investors should buy these cryptocurrencies and hold the long positions. Trading strategy for Investors in LiteCoin and Dash should be to buy the cryptocurrrencies when the price falls and sell the cryptoccurencies in the following day. Furthermore, the advice is not to buy the cryptocurrencies when the price increases since the increase will not continue. The trading strategy for investors in Cardano should be buy and hod when the price stats to increase. In line with efficient market hypothesis returns on Zcash and Waves were not predictable.

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APPENDIX

Table A1. Time span for each of the considered cryptocurrenies

cryptocurrency	First data	Last data
NEO	September 2016	December 2018
RIPPLE	August 2013	February 2019
LITECOIN	April 2013	Mart 2019
CARDANO	Octomber 2017	Mart 2019
ZCASH	Octomber 2016	Mart 2019
DASH	February 2014	Mart 2019
DOGECOIN	December 2013	Mart 2019
WAVES	Jun 2016	Mart 2019
ETHEREUM	August 2015	Mart 2019

Source: retrieved from https://coinmarketcap.com (prices in USD)

Table A2. Descriptive statistics

	CARDAO	LDASH	DOGECOIN	ETHEREUM	LITECOIN	NEO	RIPPLE	WAVES	ZCASH
Mean	-2.217094	2.984715	-7.484904	3.830559	2.323463	1.744613	-3.544382	0.407125	4.981552
Median	-2.249035	2.270062	-8.163021	4.518795	1.497388	2.885917	-4.704328	0.914287	5.177110
Maximum	0.104360	7.346558	-4.069379	7.241667	5.881482	5.233245	1.217876	2.774462	7.622894
Minimum	-3.987879	-1.155611	-9.349602	-0.832802	0.148420	-2.523469	-5.874571	-2.061664	3.301745
Std. Dev.	0.977260	2.099562	1.319305	2.214642	1.459336	2.516859	1.916881	1.356453	0.816207
Skewness	0.217100	0.327191	0.556394	-0.389373	0.631123	-0.513933	0.716321	-0.427589	-0.102909
Kurtosis	2.140860	1.685987	1.847521	1.917832	2.050677	1.605357	1.845817	1.739698	2.163765
Jarque-Bera	19.96162	165.4744	203.6095	96.57918	221.9047	102.3024	286.4218	97.04039	26.42131
Probability	0.000046	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000002
No. obs	517	1843	1904	1304	2135	818	2031	1004	855

Source: own estimates

Table 10

Cryptourrency		ADF test	PP test	KPSS test	ERS test
NEO	At levels	0.072495	-0.075787	0.687659	-0.404048
	In first differences	-28.67905	-28.72564	0.307924	-1.886793
RIPPLE	At levels	-1.520447	-1.822049	0.933903	-1.314781
	In first differences	-42.72284	-43.50702	0.077234	-8.774876
LITECOIN	At levels	-1.525157	-1.707215	0.851736	-1.322260
	In first differences	-45.19337	-45.49952	0.090250	-44.97985
CARDANO	At levels	-2.550371	-2.285854	0.397261	-0.866628
	In first differences	-13.25757	-22.62065	0.116418	-1.700633
ZCASH	At levels	-3.102132	-3.224016	0.688046	-0.901865
	In first differences	-36.89296	-35.22747	0.235429	-1.519352
DASH	At levels	-1.355462	-1.293073	0.504326	-1.172442
	In first differences	-43.65885	-43.67646	0.128332	-2.193023
DOGECOIN	At levels	-2.033882	-2.071330	0.866628	-1.794723
	In first differences	-40.92819	-40.89536	0.067402	-1.863989
WAVES	At levels	-1.498242	-1.724277	0.745416	-1.088116
	In first differences	-29.60470	-29.96332	0.164056	-6.449820
ETHEREUM	At levels	-0.469103	-0.486101	0.648847	-0.791906
	In first differences	-38.71223	-38.46813	0.182315	-2.480314

Source: own estimates. *Note: Specification of each employed unit root test includes trend and intercept

INFLUENCE OF COVID-19 PANDEMIC ON TOURISM MARKET: BIBLIOMETRIC AND CONTENT ANALYSIS

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Abstract

COVID-19 pandemic is one of the greatest challenges for countries and economies worldwide. It has, without doubt, influenced tourism market to a large extent. Travel industry has stopped overnight, negative economic aspects were numerous, and the future of the industry became uncertain. Although pandemic affected the majority of economic activities, some of them started to recovering, but tourism is still facing large decline and will have long term consequences. It is hard to predict when and to what extent tourism market will recover and function normally. Therefore, numerous researchers focused on analysing available data in order to provide possible scenarios for the future of tourism market. A large number of articles within the area was published in last few months, but the oldest one dates from the beginning of 2020. Therefore, this research area is still in the developing phase without clear, due to the fact that researchers are still "grope in the dark". This paper puts focus on the analyses of recent research in the area of influence of COVID-19 pandemics on global tourism market and provides bibliographic analysis of journal articles within the "COVID 19 and tourism" search. Additionally, based on qualitative content analysis the aim is to identify current state of the research in this field and to identify future research potentials.

Key words: tourism, COVID-19, bibliographic analysis, content analysis.

1. INTRODUCTION

COVID-19 pandemic is one of the greatest challenges for countries and economies worldwide. *"While the COVID-19 outbreak in China in January 2020 was initially seen to be a local issue (albeit its worldwide economic effects were recognized very soon), the spread of the virus to other parts of the world in February and March 2020 started a major global crisis of an unprecedented scale and nature"* (Niewiadomski, 2020: 2). It affects all the aspects of people's lives for almost a year. Total or partial lockdown, together with uncertainty and anxiety within "new normal", affects tourism market to a large extent.

Tourism, activity which generated 1.4 billion international tourism arrivals in 2019 (UNWTO, 2020) and is an important part of almost every economy worldwide, has stopped overnight. Traveling become a part of "old life", excluded from "new normal". Although pandemic affected the majority of economic activities, some of them started to recovering, but tourism is still facing large decline and will have long term consequences. It is hard to predict when and to what extent tourism market will recover and function normally, due to the fact that "public and massive models of mobility (i.e. airplanes, trains, buses, ships, etc.) have been recognized as a primary threat to the spread of this new disease and thus first to be made subject to preventive measures" (Turnšek et al., 2020: 4).

Due to its numerous negative effects and uncertainty, COVID-19 pandemic and its influence on tourism market is in the focus of many researchers in last few months. Researchers are analysing available data and putting efforts to create possible scenarios for the future of

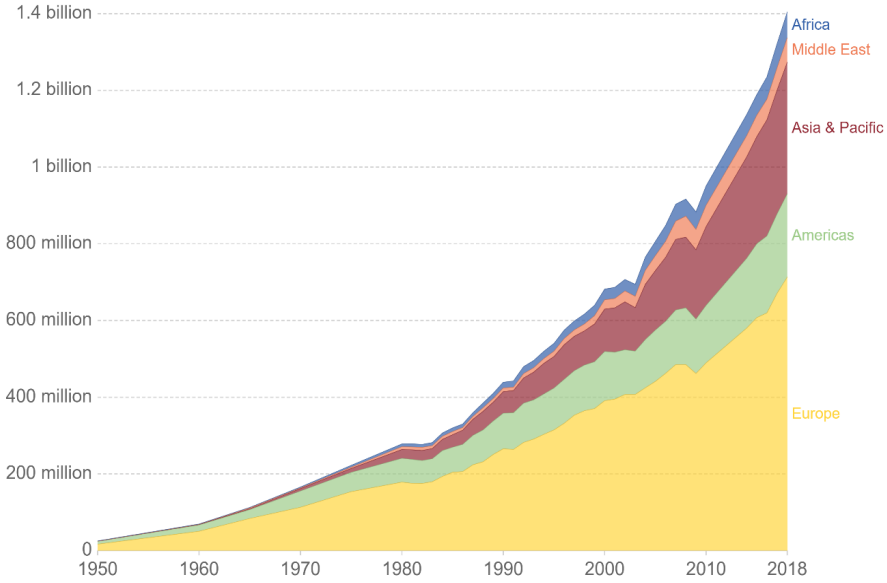
tourism market. This research area is still on the beginning, and research approaches are in the development phase. Prayag (2020) proposed interesting research agenda for tourism resilience due to pandemics which includes three different levels of resilience: 1) macrolevel of resilience – researching: 1a) tourism system (components, structure, relationships, stability); 1b) tourism destination (where and why); 1c) tourism dependent communities (vulnerability, diversification, sustainability); 2) mesolevel of resilience – researching: 2a) tourism organizations (size and ownership); 2b) tourism non-governmental organizations and public institutions; 2c) tourism networks and value chains (supply chain); 3) microlevel of resilience – researching: 3a) tourism employees (where and why); 3b) tourists (impacts and opportunities, segments); 3c) residents (support and animosity); 3d) other tourism related temporary population (second home owners, seasonal workers). It is hard to expect that research of the area covers all mentioned levels, due to the fact that the oldest paper dates form January 2020 and that researchers are still "grope in the dark". The aim of this paper is to provide the analyses of recent research in the area of influence of COVID-19 pandemics on global tourism market. Paper provides bibliographic analysis of journal articles within the "COVID 19 and tourism" search. Additionally, based on qualitative content analysis the aim is to identify current state of the research in this field and to identify future research potentials.

2. THEORETICAL BACKGROUND

For several times in the past, global tourism has been exposed to a wide range of crises, such as the September 11 terrorist attacks (2001), the severe acute respiratory syndrome (SARS) outbreak (2003), the global economic crisis unfolding in 2008/2009, and the 2015 Middle East Respiratory Syndrome (MERS) outbreak (Gössling, Scott and Hall, 2020). Due to same authors, none of them led to a longer-term decline in the global development of tourism, which, as a system, has been resilient to external shocks. Will the COVID-19 pandemic affect global tourism market more than any crises before?

In January 2020 Chinese government provided information about the virus and stricter preventive measures swept across Chinese cities, while in March, Europe and the United States have become the epicentres of the pandemic and imposed restrictions on human mobility (Yang, Zhang and Chen, 2020). Pandemic influenced normal functioning of an individual, household, village, city, province, country, region and that of entire globe at present (Korinth and Ranasinghe, 2020). Very soon, tourism literally stopped. "The right to travel and to enjoy the services of hospitality and tourism operators has been curtailed in a way unprecedented except in times of the world wars of the twentieth century" (Baum and Hai, 2020:2397). The majority of crises affects only one country or region, while this pandemic influenced almost entire planet. Furthermore, traveling today is not a privilege of reach people, as it was in the past. From 1950 the number of international tourist arrivals is in constant growth, as shown in Figure 1.

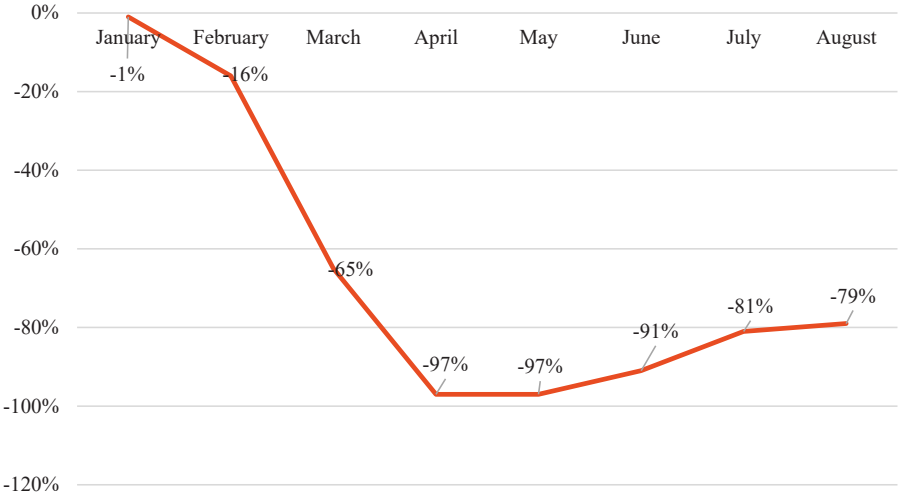
Figure 1. International tourist arrivals by region



Source: UNWTO – World tourism barometer (2019)

In 2019, 1.5 billion international tourist arrivals were recorded in 2019, globally (UNWTO, 2020). As shown in the figure, the highest share in international tourism arrivals belongs to Europe, while Asia & Pacific are on the second place. Americas are on third place, while Africa and Middle east have the smallest share in total international tourist arrivals. This numbers confirm mentioned resilience and fast recovery of tourism market on the global level. However, COVID-19 pandemics changed the market, as shown in Figure 2.

Figure 2: Decline in international tourism arrivals in 2020 by month (world)



Source: UNWTO (2020)

Tourism arrivals are compared with the same period in 2019. Decline in international arrival started in January 2020. Highest decline was during April and May, due to the fact that borders were closed and many countries had lockdown. Expected recovery during July and August happened in several countries (e.g. in Croatia), but on the global level decline is still quite high. Unfortunately, these numbers showed that COVID-19 pandemic is different than any other crises which happened in the past. Decline in tourist arrival leads to decline in income and increases unemployment, both direct and indirect. As Hall, Scott and Gössling (2020) stated, international travel is more complicated in terms of restart, and the majority of destinations will be dependent on the timing of vaccine development and mass deployment as well as uncertain traveller anxieties and the existence of at-risk market segments (e.g. senior tourists).

According to possible scenarios provided by World Travel & Tourism Council (2020) visitor loss in 2020 could vary from 41% to 67% in international arrivals or from 26% to 55% in domestic arrivals, while total tourism related GDP in 2020 will be between 3,435 bn USD and 5,543 bn USD lower than tourism related GDP in 2019. Unfortunately, current situation shows that even worst scenario was too optimistic, and that tourism recovery cannot be expected before April or May 2021. It is also possible to expect that people will not travel as they travelled before, due to the lower income and changed way of life. As Sigala stated (2020), research, education and our socio-economic and political system framed our mindset and affected the way we research, measure, understand, respond and aim to recover from the COVID-19. Therefore, the vaccine is not the only element which will affect tourism recovery. Numerous stakeholders in the destination and on the generating markets will have an important role in tourism recovery but will also affect the way tourism of the future will look like.

Destinations have the unique opportunity to rethink exactly what tourism will look like for the decades ahead and choose a path which leads to transformation in tourism which can be realized if sufficient institutional innovation occurs on both the demand and supply side of tourism (Brouder, 2020). *"Many are hopeful that this wakeup call event is an opportunity to reshape tourism into a model that is more sustainable, inclusive and caring of the many stakeholders that rely on it (Cheer, 2020:1)"*. Some of the destinations will use this situation to implement sustainability in their strategy, while a part of destination will function same way as before COVID-19 pandemic. When thinking about tourism sustainability, we have to have in mind the fact that "true sustainability will only occur when it is valued as a part of the taken-for-granted daily life of individuals and cultures across the globe" (Galvani, Lew and Perez, 2020:1). Due to this fact, COVID-19 pandemic could have positive influence on tourism destinations because it affects everyday life and changes the way people think and act. Açikgöz and Günay (2020) emphasized several trends in everyday life:

a) crowded cities will tend to lose their significance achieved after the industrial revolution, cleanliness, health, and hygiene will have a priority in;
b) new protection mechanisms such as preservation and packaging for the nutritious food will bring new costs to the consumers;
c) the future of paper money and coins circulated for the transactions will be discussed further.

These trends will affect tourism market. Lifestyle change in Western societies will result with the increasing number of more conscious consumers and mindfulness-driven products and services (Stankov, Filimonau and Vujičić, 2020). Tourism service providers will have to adopt their offer in order to satisfy needs of tourism demand. An important tool which will help decision makers in tourism to find the best solution to overcome this situation, is the research concerning influence of COVID-19 pandemic on tourism market. Although this research is still

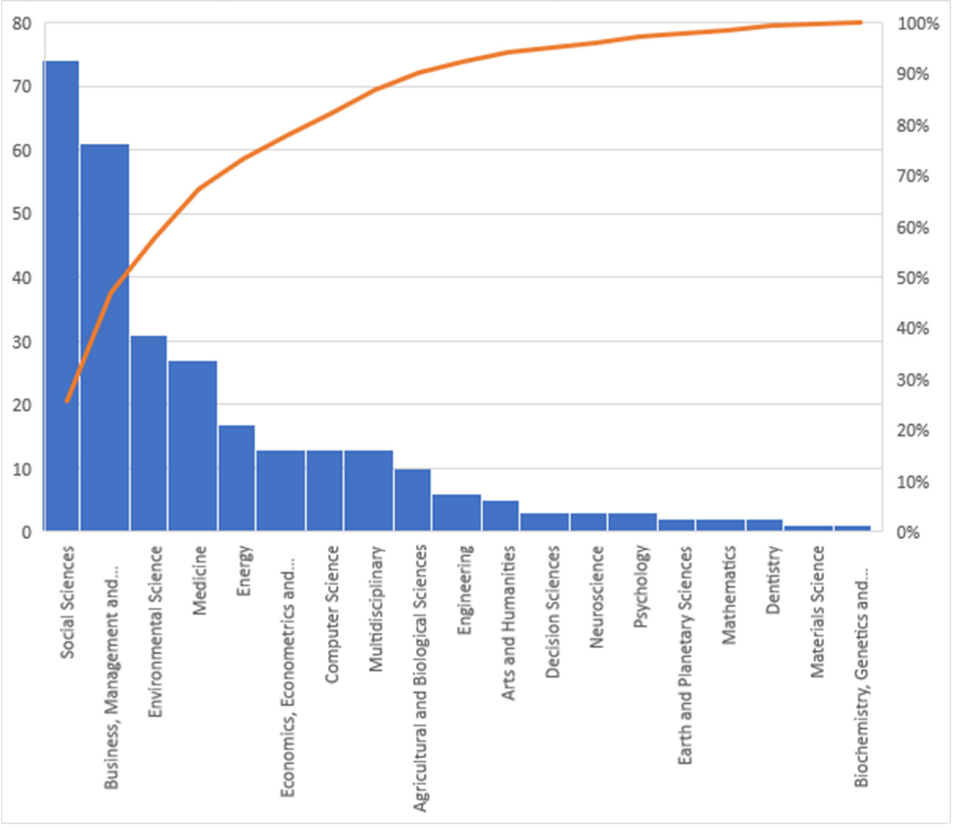
in the beginning, during last few months a large number of papers was published, as shown and analysed as listed hereafter.

3. METHODOLOGY

Before the content analysis of chosen papers, the authors provide bibliographic analysis of journal articles within the "COVID-19 pandemic" search. The data was collected from Scopus database on 02 September 2020. The search (title, abstract, key words) resulted with 152 articles in 2020 (until 02 September). To get an insight into the research conducted in the field of COVID-19 influence on tourism, author used different criteria such as: research area and country/territory of the authors.

Analysed articles were published in 87 different journals within 22 different research areas, which indicates that researched area is quite complex and multidisciplinary. More than half of all articles is published in 6 journals (all tourism related). Research areas with published articles on sharing economy in tourism are shown in Figure 3.

Figure 3. Areas with published articles on COVID-19 pandemic and tourism



Source: Scopus database

When it comes to the country/territory of the authors, there are 70 different countries on the list. First seven countries on the list account for more than 70% of all articles (United States (26), United Kingdom (21), Australia (16), Spain (12), China (11), New Zealand (11) and Canada (10). Those countries represent important receiving tourism markets on global level and have been significantly affected by COVID-19 pandemic. Therefore, the interest of researchers from those countries was expected.

4. FINDINGS AND CONCLUSION

Following the bibliographic analysis, the authors conducted citation analysis which resulted with 13 articles cited more than 15 times. Nine of them was included in the analyses, due to the fact that 4 were not directly connected to tourism. This was the criteria for the sample selected for the content analyses, which "enables the researchers to uncover concepts, themes and relationship in the analyzed articles" (Krippendorf, 2012) and to provide valid and trustworthy results.

Table 1 provides the data about authors and title of the article, year of publication, name of the journal, number of citations in Scopus, geographic area of research, research subject, methodology and short overview of research results. The main conclusions of the analysis are discussed below.

Table 1. Top 13 most cited articles on COVID-19 pandemic influence on tourism

No	Authors	Title	Journal	Citations in Scopus	Research focus
1	Gössling, S., Scott, D., Hall, C.M.	Pandemics, tourism and global change: a rapid assessment of COVID-19	*Journal of Sustainable Tourism*	154	Paper compares the impacts of COVID-19 to previous epidemic/pandemics and other types of global crises and explores how the pandemic may change society, the economy, and tourism
2	Hall, C.M., Scott, D., Gössling, S.	Pandemics, transformations and tourism: be careful what you wish for.	*Tourism Geographies*	38	A comprehensive overview of pandemics and their effects is provided. y. It is concluded that that the selective nature of the effects of COVID-19 and the measures to contain it may lead to reorientation of tourism in some cases, but in others will contribute to policies reflecting the selfish nationalism of some countries.
3	Higgins-Desbiolles, F.	Socialising tourism for social and ecological justice after COVID-19	*Tourism Geographies*	36	The COVID-19 pandemic of 2019–2020 has the potential to transform the tourism industry as well as the context in which it operates. It may offer a rare and invaluable opportunity to rethink and reset tourism toward a better pathway for the future.

4	Yang, Y., Zhang, H., & Chen, X.	Coronavirus pandemic and tourism: Dynamic stochastic general equilibrium modelling of infectious disease outbreak	*Annals of Tourism Research*	30	Authors propose and calibrate a dynamic stochastic general equilibrium (DSGE) model to understand the effect of infectious disease outbreak on tourism. By applying this model to the case of coronavirus pandemic, this study represents a pioneering research effort on evaluating the impact of coronavirus on tourism.
5	Sigala, M.	Tourism and COVID-19: impacts and implications for advancing and resetting industry and research	*Journal of Business Research*	29	This paper aims to critically review past and emerging literature to help professionals and researchers alike to better understand, manage and valorize both the tourism impacts and transformational affordance of COVID-19.
6	Brouder, P.	Reset redux: possible evolutionary pathways towards the transformation of tourism in a COVID-19 world	*Tourism Geographies*	19	A path that leads to transformation in tourism can be realized if sufficient institutional innovation occurs on both the demand and supply side of tourism that can foster the emergence of new paths. COVID-19 presents a once in a generation opportunity where the institutional pump is primed for transformation.
7	Baum, T., Hai, N.T.T.	Hospitality, tourism, human rights and the impact of COVID-19	*International Journal of Contemporary Hospitality Management*	17	Paper undertakes a "real-time" assessment of the impact of the COVID-19 pandemic on the right to participate in hospitality and tourism and to illustrate where such rights are under threat. Findings showed that rights to participate in hospitality and tourism, particularly in parts of Asia, Europe and North America, were affected on a scale in peacetime.
8	Zenker, S., Kock, F.	The coronavirus pandemic – A critical discussion of a tourism research agenda	*Tourism Management*	15	Paper provides six illustrative examples are shown how a research agenda could look like. This includes parts. where theoretical explanations from tourism are missing, as well as where authors think existing knowledge might be subject to a tourism paradigm-shift due to the coronavirus pandemic.
9	Prideaux, B., Thompson, M., Pabel, A.	Lessons from COVID-19 can prepare global tourism for the economic transformation needed to combat climate change	*Tourism Geographies.*	15	The paper provides critical analyses of the model which could offer the tourism industry numerous opportunities to transform from the current model that favours a high resource consumption model to one that is environmentally friendly and resource neutral.

Source: Scopus database

Based on this analysis, it is possible to draw several conclusions about research area. Firstly, the majority of research is focused on secondary sources and previous experiences with new diseases or natural (or manmade) disasters which changed tourism market. However, it is

not easy to provide the solution from previous experience, due to the fact that now days people travel more than ever and decline in tourism arrivals affects economies to a large extent. Furthermore, COVID-19 pandemic cannot be prevailed so easy, due to the time necessary for vaccine development. The focus of analysed researches is oriented mostly on the supply side of the market. Researchers are firstly trying to analyse available tourism statistics and observe the situation on supply side.

Although some of the researches are focused on one or several markets, the majority of them is focused on global data and the situation worldwide, due to the fact that COVID-19 pandemic affected the entire tourism market. World Travel & Tourism Council (2020), in collaboration with Oxford Economics, created three possible tourism economic impacts scenarios – upside, baseline and downside. Analyzed papers do not provide an answer which scenario is most objective, but do provide possible solutions for faster recovery. Furthermore, some of them see this situation as an opportunity for avoiding overtourism and implementing sustainable development in the destinations. They consider this path the one which would, in the log run, provide both economic and non-economic benefits for the destinations, as well as for the global tourism market.

Based on the research results, it is possible to conclude that it is still too early to provide any scenarios or possible solutions which could be totally reliable, due to the fact that there is still lack of data and information for the broader analyses. The fact that this a new research area represents the main limitation of this paper, both in bibliometric and content analyses. In several years, same analyses should be made in order to see the difference in the results and to provide new findings. However, it is possible to expect that future research on the influence of COVID-19 pandemic on tourism will be more focused on the demand side in order to provide expectations, motivation and plans for traveling once pandemic ends. This kind of research should result with new trends on the demand side, which will affect tourism supply to assimilate and to satisfy the demand. Furthermore, future research will probably be more oriented to specific region or destination, due to numerous differences among tourism demand and supply worldwide.

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ANALYSIS OF RETAIL SECTOR IN THE WESTERN BALKANS REGION AFTER COVID-19 PANDEMIC

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Abstract

The aim of this paper is to analyze the situation that will occur in the retail sector of selected countries of the Western Balkans region, after COVID-19 pandemic. The research will be conducted in two parts: a) comparison of the situation in the retail sector in the period before and during the global pandemic; b) comparative overview of the consequences of the COVID-19 pandemic among the selected Western Balkans countries with a projection of BPD decline based on three possible scenarios until the end of global pandemics. The newest international studies showed a significant share of electronic retailing in total retail revenue during the period of pandemic. Thus, analysis of importance and role of electronic retailing in traditional marketing channels during the global pandemic will be separate part of research in this paper. Based on the obtained results, a projection of the situation on the market of the Western Balkans countries will be made. The results of the research will indicate what measures need to be taken in order to return the level of income and profitability of retail sector to the period before the pandemic to the competent institutions, trade policy makers and the management of retail companies. Suggestions and guidelines for future research are given in the paper.

Key words: retail, multichannel retailing, COVID-19 pandemic, retail companies, Western Balkans.

1. INTRODUCTION

Following the declaration of a global COVID-19 pandemic caused by the SARS-Cov2 virus, the Western Balkans regional market has faced large fluctuations on the demand side. In the first wave of the pandemic (March-April, 2020), following the example of most European countries, the countries of the Western Balkans opted for a policy of lockdown and quarantine measures in the fight against the virus. This type of anti-pandemic measures included the introduction of a state of emergency, restriction of movement, reduction of physical contacts, social distance and mandatory wearing of protective masks and other medical equipment (gloves, disinfectants, etc.). As a consequence, on the one hand, the working hours of retail facilities were limited, while, on the other hand, shortages appear, as a result of panic accumulation of essential products during pandemics such as: long - lasting food products (flour, yeast, rice, oil, salt, etc.), fresh meat and meat products, canned food, bottled water, medicines, masks and other medical supplies, hygiene products, etc. The sudden increase in demand for these products led to the creation of large gaps in supply chains that were unprepared for such market shocks.

In addition, as a result of fear of the spread of infection, safety and health problems in retail outlets, as well as restrictions on the operation of retail outlets, consumers are increasingly turning to electronic marketing channels and ordering products from home. According to the latest results (Ali, 2020), electronic retailing sales increased by 30.1% in the first two quarters of 2020, compared to the same period in 2019. However, the large growth of electronic retailing has failed to compensate for the decline in demand for non-essential products (furniture,

appliances, electronic devices, etc.). As a result, between March and June 2020, as many as 21 major North American retail chains (New York & Co., Brooks Brothers, JC Penney, etc.) applied for assistance and protection from the bankruptcy caused by the COVID-19 pandemic (Ali, 2020).

Following the conclusion of a policy of closure and a relatively effective response to the spread of the pandemic, the countries of the Western Balkans began to gradually ease measures (May-June 2020), which led to normalization in supply and balancing supply and demand. However, the reactivation of the epidemic (July-August 2020) disrupted the complete normalization of the situation in the retail sector. Fear and uncertainty about the further course of the epidemic has caused consumers significantly less need for non-food and exclusive products. The decline in sales was recorded by clothing and footwear (-15%), furniture (-30%), cars (-20%), appliances and household furnishing products (-25%), IT equipment and electronic devices (-10%), etc.

The recession that will affect the global economy is shown by the projection of the International Monetary Fund (IMF), which predicts a decline in world GDP of -4.9% (-8.0% for developed economies). The Euro zone expects a decline in GDP of -10.2% (France -12.5%, Spain -12.8%, Germany -7.8%), the United States a decline of -8%, while only China predicts moderate GDP growth, about 1% (IMF, 2020). It is similar with the retail sector, which is expected to decline by -5.7% (O'Connell, 2020). The decline will be more pronounced in the non-food product categories, with a significant reduction in the number of consumers in traditional retail formats. Electronic retailing will record growth, but as it accounts for only 6% of the share of total retail sales, this growth will not significantly affect the final situation in the retail sector (Sievers, 2020).

Bearing in mind the presented aspects, *the aim of this paper* is to analyze the situation in the retail sector of selected countries in the Western Balkans region (Croatia, Serbia, B&H, Montenegro) after the COVID-19 pandemic. Based on three possible scenarios for the end of the pandemic, which is assumed by Fernandes in the study of the IESE Business School from Spain (Fernandes, 2020), World Bank and International Monetary Fund - IMF, a projection of GDP in the Western Balkans, future trends and trends in the retail sector were made. The research will be conducted from two parts: a) comparison of the situation in the retail sector in the period before and during the global pandemic; b) a comparative overview of the consequences of the COVID-19 pandemic in the retail market of the Western Balkans. *The practical significance* of the research is reflected in the definition of measures that competent national institutions (Ministries, Chambers of Commerce, Agencies, etc.), economic policy makers and management of trade companies should take in order to reduce the negative consequences of the recession in the retail sector.

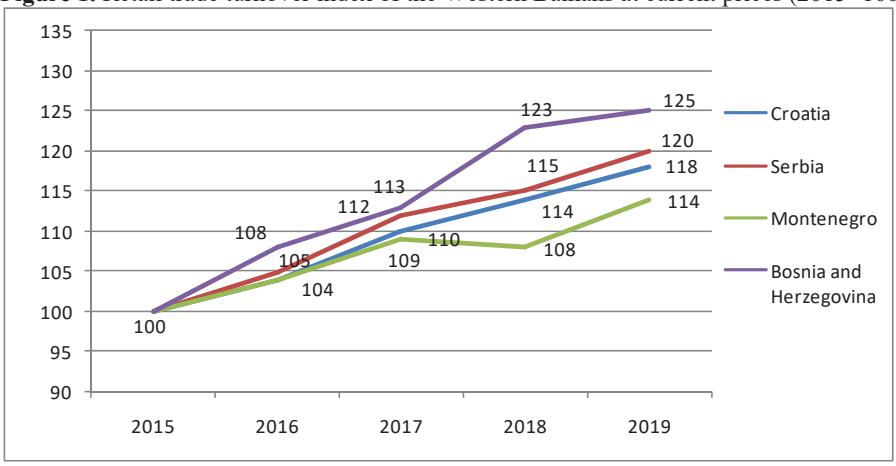
2. RETAIL SECTOR IN THE PERIOD BEFORE THE COVID-19 PANDEMIC

In the period leading up to the global pandemic, the countries of the Western Balkans recorded significant GDP growth rates, as follows: Serbia +4.2% (5th place in Europe), Montenegro +3.6%, Croatia +2.9%, Bosnia and Herzegovina +2.7% (IMF, 2020). Also, other macroeconomic indicators of the Western Balkans show good results. The inflation rate ranges from 0.7% (Montenegro) to 1.4% (Serbia), while the unemployment rate is at an acceptable 7.8% (Croatia) and 10.9 (Serbia), to a high 15.7% (B&H). Although the first quarter of 2020 was partly affected by the pandemic, the data for some countries in the Western Balkans were extraordinary. The Republic of Serbia achieved the first place in Europe measured by GDP growth (+5%) and a significant drop in the unemployment rate to 9.4%. Other countries also

show positive rates, so that the Montenegrin economy is growing at a rate of +2.7%, B&H +2%, while Croatia has the lowest growth in Q1 of 0.4% (Trading economics, 2020).

The pre-pandemic retail sector is following the growth of domestic economies. The upward trend in the growth of product placement on the Western Balkans market has been present since 2015 with its peak, at the end of 2019 and the beginning of 2020. The following figure illustrates retail growth rates measured by current prices in selected Western Balkan countries in the period 2015-2019 (Figure 1).

Figure 1. Retail trade turnover index of the Western Balkans at current prices (2015=100)



If we look at the five-year period, with the base year 2015, the retail sales of the Western Balkan countries are continuously growing. The highest growth rates are recorded in Bosnia and Herzegovina (25%) and Serbia (20%). The structure of placements is dominated by food products, alcoholic beverages and tobacco products (about 65% share in the consumer basket), whose consumption is growing at a rate of 2 to 3% higher, compared to the average annual growth of retail. The average share of retail in the total domestic GDP for all analyzed countries is around 10%, with a total share in the total number of employees of 12%. The biggest problem of the retail sector of the Western Balkans region, observed in the domestic markets, is the uneven regional development, a large degree of centralization and the existence of differences between rural and urban areas.

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pandemic period, when there is a panic accumulation of basic food stocks in urban areas and large city cores, resulting in weakening of supply chains and disruption of the placement mechanism.

The growth of placements in traditional marketing channels was accompanied by an increasing growth of the share of electronic retailing. The growth rate of electronic retailing in the Western Balkans region is approaching the European average of 14% for 2019. In the analyzed countries, products of lesser value (up to € 100), such as footwear and clothing, books, cosmetics, office supplies, toys, music equipment, etc., are most often ordered through electronic channels (Lovreta et al., 2019). The problem of even greater expansion of electronic retailing in the Western Balkans is the low percentage of Internet penetration in domestic markets (Cro. 69%, Srb. 74%), as well as the relatively low percentage of online customers among Internet users (Cro. 47%, Srb. 46%) (Knezović, 2019).

3. CONSEQUENCES OF THE COVID-19 PANDEMIC ON THE RETAIL SECTOR OF THE WESTERN BALKANS REGION

Despite certain geo-political turmoil that marked the end of 2019 on the global market (political tensions between the US-China, US-Russia, Greece-Turkey, migrant crisis, political instability in the region, etc.), projections of economic trends for The Western Balkans were optimistic and based on the growing influence of FDI, strengthening local infrastructure, better cooperation and connecting economic activities in the region. With the outbreak of the COVID-19 pandemic, at the end of the first quarter of 2020, and the commitment to a policy of lockdown as the basic anti-pandemic measure, the economy of the EU, as well as the region of the Western Balkans, is entering a recession. The recession will be especially pronounced in the sectors of tourism, culture, transport, retailing, etc. (Sulkowski, 2020).

Although the protection of human lifes has priority over economic activities, economic policy makers must take a serious approach to minimize the economic consequences that will leave the COVID-19 pandemic (Baldwin, Tomiura, 2020). As a consequence of the suspension of certain economic activities, closing of borders for trade of products and travelling of people, restriction of movement, ban on working of sales facilities, self-isolation of contacts of infected people, cancellation of large corporate events and infrastructure projects, etc., GDP of European countries has fallen -3.1% in Q1 2020, or even -15.0% in Q2 2020 (Eurostat, 2020). The recession is most pronounced in Spain (-22.1%), the United Kingdom (-21.7%) and France (19%). In the global market, excluding China (+3.2%), the largest economies, such as the US, Russia and Japan in Q2 2020, recorded the lowest race rates in the last 20 years (US -9.1%; Russia -8.5 %, Japan -9.9%).

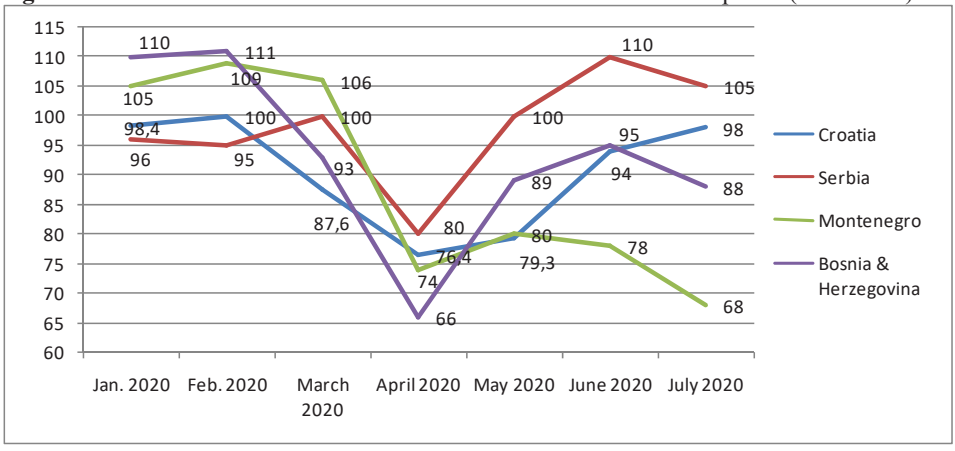
After relatively satisfactory growth in Q1 2020, the countries of the Western Balkans are experiencing a similar scenario. Thus, for example, the GDP of Serbia after the most successful first quarter in the last 30 years recorded a drastic decline in GDP of -6.4% in Q2. The most endangered are the countries which economic activity largely relies on the tourism sector; the Croatian economy is falling at a rate of -15.1%, and the economy of Montenegro at a rate of -6.5% (Trading Economics, 2020).

The exponential rate of virus spread and increased uncertainty about how bad the situation could be, have led consumers to flee to safe consumption (Ozili, Arun, 2020). Precisely because of this, large oscillations are observed in the retail sector, which is completely polarized with a rapid growth in demand for basic foodstuffs and a decline in demand for long-lived non-food products. In addition to shortages, due to shocks on the demand side, there is an increase in prices of meat and meat products, oil, flour, yeast, rice, bottled water and other essential

products, especially drugs, protective masks and other pharmaceutical equipment. At the same time, there is a noticeable trend of temporary closure and suspension of activities in specialized stores of appliences, tools, electronic devices, household equipment, etc.

As a result of these trends, the Serbian retail sector recorded a decline of -2.1% in Q2, with the highest rate of decline in April of -20%. Due to the high HHI market centralization index of the Republic of Serbia, the decline is more pronounced in urban areas (-4.2%) due to shortages, high demand and stockpiling, compared to rural parts of the market with moderate growth (+1.2%). In the structure of placements in Q2, food products, tobacco and pharmaceutical products dominated with a share of 56.7%, with an above-average increase in the share of pharmaceutical products and medical equipment to 11.4% and a decrease in the share of non-food and household products to 24.7% (Republički zavod za statistiku, 2020). Similarly, the retail market of the Republic of Croatia in the first half of 2020 recorded a decline of -5.8%. The decline was more pronounced in April of -24.8%, while the total retail turnover in the same month fell by as much as -26.3% compared to the same period last year. In the structure of placements, expressed in current prices, for the period I-VI 2020 turnover of footwear and clothing decreased by -28.8%, motor vehicles by -18.1% and IT equipment, books and newspapers by -8.3% (Državni zavod za statistiku, 2020). In B&H, total retail trade turnover, observed in current prices, in the period I-VI in 2020, recorded a decline of -8.3% compared to the same period last year. Trade in food products (food, beverages and tobacco) fell at a rate of -3.5%, while trade in non-food products fell by -4.1%. The peak of the decline in the retail sector was in April of -31.3% compared to the same period in 2019 (Agencija za statistiku, 2020). The retail market of Montenegro also records significant decline rates, which compared to the same period in 2019, in April 2020 amounted to -26.2%, in May -21.1% and in June -22.2%. The cumulative rate of decline in Q2 2020 compared to the same period in 2019 is as high as -23.2%. The decline is more pronounced in the trade of non-food products up to -30%, with an increase in the turnover of food, drugs and pharmaceutical products (Monstat, 2020). Detailed trends in the turnover of the retail sector in the Western Balkans region for the period I-VII in 2020 illustrate Figure 2.

Figure 2. Retail trade turnover index of the Western Balkans at current prices (I-VII.2020)



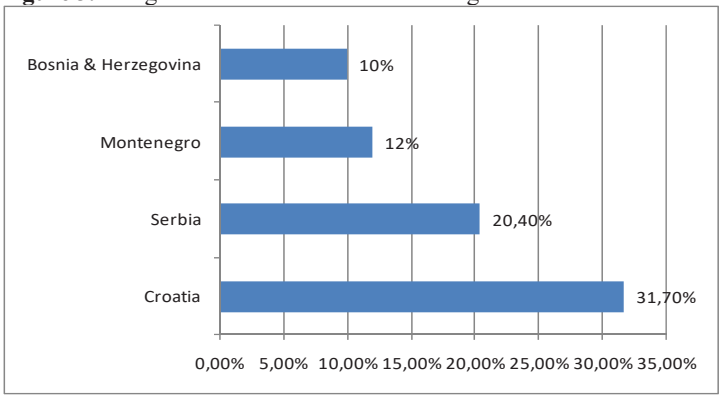
The attached figure clearly shows the consequences of restrictive anti-pandemic measures on product placement in the retail sector of the Western Balkans. All analyzed countries achieved historical minimums. The decline began in March, with a peak in April and a slight recovery in May. After the restrictive measures are relaxed, the demand normalizes in June, but

with the reactivation of the epidemic, the traffic indices fall again in July. Demand for food products is relatively stable, while long-term non-food products are still at minimum placement rates.

Along with the decline in sales in traditional channels, due to limited consumer movement, compliance with measures of physical distance, working from home, as well as still vaguely defined standards of safety and health of employees and consumers in retail facilities, the share of electronic marketing channels in total product placement raised rapidly. Retail chains have activated and strengthened their online stores and their own delivery services due to the required high standards for food transport and safety. For example, Mercator has expanded its Click and Collect service to 17 cities and 24 locations in the Western Balkans region and started using specialized vehicles to transport products to consumer locations. Doncafe has developed the "Coffee at Home" project, with over 100 daily online coffee orders at home. In Tehnomania, in March and April 2020, about 100,000 new users were registered on the network platform, while sales increased by 50% (Advertiser, 2020).

According to experts, this redirection of traditional retailers to electronic forms of placement has led to an increase in ordering and selling products via the Internet in all Western Balkan countries. Electronic retailing of Serbia in the period I-VI 2020 grows at a rate of 20.4% with a total of over 3 million consumers. The growth rate in Croatia is 31.7% with an increase in the number of online consumers of 8.4% (2.2 million). In Bosnia and Herzegovina, the internet market penetration rate is 72% with the growth of online shopping in 2020 of about 10%. In Montenegro, the rate is +12%, with 240 entrepreneurs and companies applying for distance selling (Figure 3).

Figure 3. The growth rate of electronic retailing in the Western Balkans in the period I-VI 2020

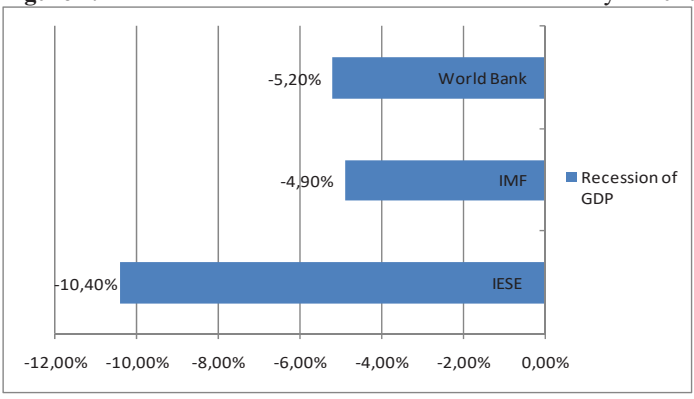


It is important to note that the structure of online shopping has changed significantly. In the period before the COVID-19 pandemic, long-lasting non-food products such as clothing and footwear, books, IT and mobile equipment, furniture, car equipment, etc. dominated. The products were most often ordered from global electronic retailers: Amazon, Alibaba, E-Baye, etc. With the appearance of the pandemic, the structure is dominated by food products, and the main electronic entities in the Western Balkans region become traditional retailers: Univerexport, Idea, Mercator, Voli, Tehnomania, etc. Therefore, the total share of electronic retailing in the total turnover of products from 6% in the pre-pandemic period, increased to about 10% in Q2 2020 with a tendency for further growth.

4. THE COVID-19 PANDEMIC COMPLETION SCENARIO AND RETAIL SECTOR RECOVERY

In order to make a more realistic projection of the end of the pandemic and to propose a list of anti-crisis measures that need to be taken in order to recover retail sales in the Western Balkans, three possible scenarios for ending the pandemic will be analyzed. *The first scenario* was developed by Fernandes (2020) in the IESE Business School study. His pessimistic scenario of ending the pandemic implies a total duration of restrictive measures and a lockdown policy for about 4-5 months, which will cause an inconceivable economic crisis at the global level, which will lead to a fall in GDP of as much as -10.7%. Key economies would suffer the greatest economic impact, such as: the United States -8.5%, Germany -11.9%, France -10.6%, Italy -12.9%, China -5.8%, etc. *The second scenario* is based on the end of the pandemic by the end of 2020, with occasional activation of local hotspots depending on the domestic policies of easing measures. According to the IMF, the global economy will be in a recession of -4.9% (IMF, 2020). *The third scenario* was developed by the World Bank and predicts, similar to the IMF, an end to the epidemic in the current year without reintroducing a lockdown policy. According to this scenario, the world economy is falling at a rate of -5.2%. Among the most affected countries will be the USA and Japan (-6.1%), Euro zone countries (-9.1%) and Brazil (-8%) (World Bank, 2020).

Figure 4. Three scenarios of recession in the world economy in 2020

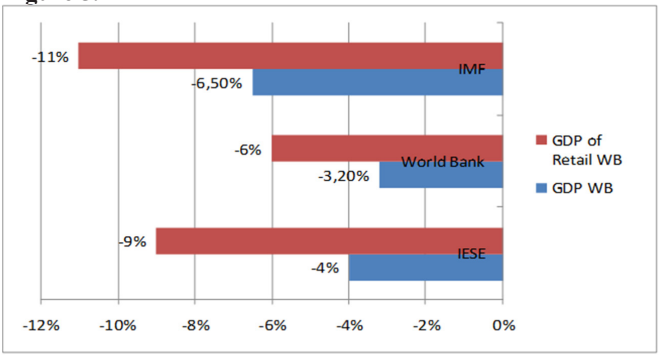


When it comes to the Western Balkans market, based on the analyzed scenarios, Fernandez expects a resection in the range of -3.5% to -4.5%. The World Bank estimates that it will be a drop of -3.2% while the IMF estimate is pessimistic and is based on a drop of -6.5%. Observed individually by the analyzed countries, the World Bank predicts a recession for Croatia -9.3%, Serbia -2.5%, Montenegro -5.6% and B&H -3.2% (World Bank, 2020). The IMF predicts significantly higher recession rates for the Western Balkans, primarily as a result of the weakening of the public sector, the tourism sector, the banking and insurance sector, and the SMEs sector. The decline in GDP is from -9% (Croatia, Montengro) to -5% (B&H) and -3% (Serbia).

The retail sector will monitor development in domestic markets and, depending on the emerging scenarios, it is possible to project a recession. If the pessimistic scenario of IESE is applied, it is to be expected that in the case of the second wave of the epidemic and the re-application of the lockdown policy, there will be a drastic drop in turnover in the retail sector in 2020, which will be around -9% for the Western Balkans region. (Serbia -4.5%, Croatia -8%, Montenegro -14%, B&H -14%). If the second scenario predicted by the IMF occurs, the

recession in the retail sector of the Western Balkans will be somewhat more pronounced and will be around -11%. Based on the third scenario, the World Bank predicted a decline in retail GDP of about -6%, with the exception of Croatia, where the largest decline in GDP is expected and thus the largest decline in the retail sector of over -10%. The summarized projections are presented in the following figure (Figure 5).

Figure 5. Three scenarios for the recession of the retail sector in the Western Balkans in 2020



It is obvious that in the event of any of the analyzed scenarios, the retail sector of the Western Balkans faces serious problems and it will be necessary for the competent state institutions, trade policy makers and management of trade companies to take a set of measures and incentives to return profitability and retail turnover from pre-pandemic period. Measures and incentives can be divided into three groups: anti-pandemic measures, financial measures to assist the retail sector and anti-crisis management measures. *Anti-pandemic measures* imply the obligation to strictly act according to the standards of safety and health protection of employees and consumers in shopping malls, retail outlets, specialized stores, etc. These are measures that aim to reduce the risk of infection in retail outlets to a minimum. This group of measures includes: application of protective masks for consumers and employees; use of barriers at the entrances to sales facilities; limiting the maximum number of consumers in accordance with the square footage of the sales facility; mandatory physical distance between consumers; clearly marked mandatory directions of movement between shelves; regular disinfection of facilities using gloves for employees, especially in the sectors for the sale of fruits, vegetables, meat, bread and pastries; use of protective glass barriers at the cash registers; regular cleaning of air conditioners and ventilation systems, etc.

Financial measures to assist the retail sector are based on fiscal and tax measures and incentives aimed at the retail sector in the Western Balkans. These measures are based on continuous support and assistance to retailers by state institutions (chambers of commerce, competent ministries, central banks, professional organizations and associations, institutes) and the development of clear recovery plans. Financial measures should include: direct financial assistance to the most vulnerable retailers such as independent retailers, specialty stores for non-durable non-food products, etc., reduction or exemption from income tax for certain categories of non-food products; reduction or exemption from payment of taxes on earnings and property; special credit lines and facilities, as well as financial incentives to maintain existing staff capacity and / or new employment; postponement of payment for basic energy sources (electricity, water, gas); programs to encourage co-financing and lending for the introduction of innovations in the retail sector and supply chains (IoT, RFID); grants for investment in retail infrastructure; etc.

Anti-crisis management measures concern the reorganization of business operations of trading companies in accordance with the circumstances imposed by the COVID-19 pandemic. This includes: 1) reduction of work during the pandemic, provided that workers remain employed and paid, and that the state compensates for the lack of wages; 2) digital transformation of traditional channels towards electronic marketing channels with further expansion of electronic retailing (it is estimated that the share of electronic retail at the end of 2020 will reach the level of 10-12% of total retail sales); 3) reorganization of business operations for distance working and redirection of employees to work from home; 4) strengthening logistical support through electronic placement channels in the form of organizing special courier services for delivery, abolition of mandatory limits as delivery conditions, strengthening the promotion of electronic ordering, opening new online stores, etc.; 4) reduction of contact between employees and consumers through the introduction of electronic self-service cash registers, the use of non-cash forms of payment (commercial bank cards, checks, electronic money), etc.

The main goal of these measures is to respond to the economic crisis based on clear health, fiscal and organizational incentives to reorganize the retail sector in line with current market needs and circumstances. Therefore, in order to prevent a further recession in the retail sector of the Western Balkans and to ensure the continuous supply of domestic markets, it is necessary to implement the complete package of listed measures without delay.

5. CONCLUSION

The beginning of 2020, on the global market, as well as in the region of the Western Balkans, was marked by great expectations. However, with the outbreak of the COVID-19 pandemic in early March, the basic expectation was to protect human lives while finding mechanisms for the "survival" of certain sectors such as tourism, transport, trade, etc. For the first time since the Great Depression, expectations are that almost all economies will experience a recession in 2020. It is estimated that over 100 million people will lose their jobs, and poverty and hunger will increase to historical proportions. Hence the need to write this paper, in order to analyze and investigate the effect of the COVID-19 pandemic on the retail sector of the Western Balkans.

As it is not still possible to predict with certainty the economic impact of the crisis and the course of the COVID-19 pandemic, this is the reason why three possible scenarios have been analyzed and recession forecasts for the retail sector have been made individually according to these scenarios. These estimates assume that, once the pandemic is over, the economic activity of the Western Balkans retail sector will return to normal. It seems, however, that the economic crisis will last longer than the pandemic period. Given the potential shock to the market during a pandemic, it is possible that the months after the end of the pandemic will be far below expectations. Therefore, it is necessary for all competent institutions responsible for the retail sector to take measures and incentives that will make this sector more flexible to the challenges of the COVID-19 pandemic.

The lack of research is reflected in the assumption of the end of the pandemic during the current year. The objective reason for this approach lays in the fact that if no cure or vaccine is found and if the pandemic continues in 2021, it is impossible, in that case from this perspective, to give any prognosis. The lack of research is the limited analysis of the countries in the Western Balkans, which was due to the authors' familiarity with the mechanisms of retail functioning in the region.

As part of the proposal for future research, the analysis should be extended to a larger sample of countries, compared with the EU retail sector and conduct an empirical survey of final consumers on the state of the retail sector during the COVID-19 pandemic.

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CONSUMERS' RESPONSE TO COVID-19 PANDEMIC

IMPACT OF COVID-19 ON TOURISM CONSUMERS: ARE WE WITNESSING TRANSFORMATION OF DEMAND PATTERNS?

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Abstract

There is little doubt that tourism as a system has been affected tremendously by the COVID-19 pandemic. International tourist flows have decreased by inconceivable rates. According to the World Tourism Organisation data, there was 22% decrease in international tourist arrivals in Q1 2020. Arrivals in March were cut by 57%, while in April they were down by 97%, which translates into a loss of 180 million international arrivals and about USD 195 billion in receipts. Such decrease caused by external factor was unpredictable and was never before registered. Due to numerous restrictions in the transportation industry, closure of the borders and differentiated business models in majority of tourism business entities caused by epidemiological conditions and required physical distance, tourism will have to adapt to those changes and provide adjusted products and services to its consumers. As a reaction to lockdowns worldwide, the number of tourist arrivals has been cut instantly with the global spread of virus. However, there is a growing concern about the future patterns in tourism demand, especially when talking about international tourism. Therefore, the aim of this research is to determine similarities between the current pandemic and previous global health threats that have influenced tourism flows in order to define potential measure for overcoming the drop in tourist numbers. Additionally, the aim is to conduct primary research among potential tourists so that travel patterns and willingness to travel could be determined. The contribution of this research lies in the fact that tourism is facing significant change and therefore it is crucial to determine what will influence tourists' decision to travel and how the whole tourism system can be adjusted to the post-COVID state of mind.

Key words: tourism demand, international tourist arrivals, transforming tourism, COVID-19

1. INTRODUCTION

The impacts of COVID-19 pandemic are beyond a doubt the biggest challenge put before the humankind since the World War II. The effects are spread across all economic and social activities, they have impacts on livelihoods, family patterns, social interactions, health (both physical and mental) and overall living conditions. Lockdowns worldwide have caused disturbances in living habits, have brought in uncertainty and anxiety to majority of population and have changed the way world is functioning. Lot of habits will probably be left behind; people will adapt the new normality and within those newly defined conditions new behaviour patterns will be defined.

"While the COVID-19 outbreak in China in January 2020 was initially seen to be a local issue (albeit its worldwide economic effects were recognized very soon), the spread of the virus to other parts of the world in February and March 2020 started a major global crisis of an unprecedented scale and nature" (Niewiadomski, 2020, 2). Among numerous others, impacts

on tourism have reached unforeseeable decline, most easily noticeable in international tourist arrivals and, consequently, international tourist receipts. *"Public and massive models of mobility (i.e. airplanes, trains, buses, ships, etc.) have been recognized as a primary threat to the spread of this new disease and thus first to be made subject to preventive measures"* (Turnšek *et al*., 2020, 4). This has further on had impact on decline in international demand, while lockdowns and social (later on redefined as physical) distancing have brought in significant changes in formerly common social interactions. Tourism is really important global economic activity, but is before all a social phenomenon and as such strongly relies on social interactions. Therefore, these new measures have had enormous impact on tourism system globally.

The aim of this paper is to determine similarities between the current pandemic and previous global health threats that have influenced tourism flows in order to define potential measure for overcoming the drop in tourist numbers. The aim is to critically analyse whether certain similarities can be emphasized and whether tourism system could use some former adjustment measures. Furthermore, the aim is to conduct primary research among potential tourists so that travel patterns and willingness to travel could be determined. The changes in travel behaviour as a response to the new normality and adjustments of tourism supply to the new conditions are among the key research questions in contemporary tourism research. It has to be emphasized, though, that these new travel conditions and redefined behaviour have to be directed towards sustainable practices. The contribution of this research lies in determining factors which will influence tourists' decision to travel and how the whole tourism system can be adjusted to the post-COVID conditions.

2. THEORETICAL IMPLICATIONS

In order to determine the scope and spread of COVID-19 pandemic on tourism systems worldwide, it seems crucial to address the impacts of SARS, which had similar, but far milder effects on tourism turnover. Even though the COVID-19 pandemics has influenced almost all aspects of life of communities worldwide, it is possible to draw certain conclusions from former crises in order to provide best possible response strategies in current conditions.

2.1. Lessons learned from SARS

Even though the scope of COVID-19 pandemic is beyond a doubt extreme global event, some similarities can be drawn between this pandemic and SARS disease in 2003. In general, it can be argued that *"due to its inherent characteristics, the tourism industry is particularly vulnerable to crises not confined to any geographical region, ranging from natural disasters to epidemics, and rom mismanagement to security concerns"* (Garg, 2015, 2). Therefore, the latest pandemic has had such enormous impacts on health systems and economies worldwide, not to mention human casualties and millions of infected people worldwide.

"SARS, which has been caused by atypical pneumonia and has spread through close person to person contact, has generated panic all over the world since its outbreak in March 2003" (Kuo *et al*., 2008, 918). The occurrence of both viruses is temporally synchronized in terms of the period of the year, but the difference is in the final outcome of each disease. Crisis events have been researched extensively, especially in terms of their impacts on international inbound tourism demand. Wang (2009) has come to a conclusion that any impact on safety, whether domestic or international, negatively affects tourism demand. The impact of financial crises is less significant, while the safety and health of tourists is the key to maintain demand for inbound tourism. For this reason, inbound tourism has become a major obstacle of tourism

development in 2020 and countries are struggling to balance between the number of infected people, the options of opening borders and minimizing the possibilities of importing virus from other countries. Page, Song and Wu have drawn an interesting, somewhat predicting conclusion that, *"although the economic costs of the swine flu pandemic were relatively low, in the longer-term similar pandemics can be expected to result in much higher costs"* (2012, 143).

The impact of SARS on national economies differed from country to country. Haque and Haque (2018) have proven that within the first 12 months' post-swine flu period Brunei lost B$14,882,820 due to swine flu alone. On the other hand, based on the SARS outbreak and impacts, Pine and McKercher (2004) concluded that, despite the expectations and significant decline in business operations, tourist numbers have gone up surprisingly quickly after the crisis. They do emphasize, though, that it is clear that tourism has extremely fragile nature and therefore unpredictable events are to be anticipated and different response scenarios should be prepared and reactions should be immediate, in order to minimize negative effects on destination and global level.

The SARS outbreak was most easily visible through the decline in numerous events which were either postponed or cancelled due to virus spread. "The absence of major international events or catastrophes that might contribute to the shortfall leads us to believe that the uncertainties caused by the illness are still casting doubts in the minds of the tourists" (Min, 2005, 505). However, the impacts of SARS disease did not cause much harm to international tourist arrivals or the development of international tourism. It has to be stated that *"the changes to travel security (after 2001) and airline restructuring (after 2008), the long-term development of international tourism has continued without any real evidence of systemic change (i.e. more people continue to travel and spend more money than ever before)"* (Brouder, 2020: 3).

It has to be stated, though, that not much has been learned, or at least not implemented after the SARS crisis. For instance, Zeng, Carter and De Lacy (2005) have emphasized that the SARS crisis has provided optimal conditions for modifying tourism development towards nature-based areas. That would enable rural areas to become more intensively involved in tourism development and to provide more sustainable development in the long-run. That, however, did not happen on global level and mass tourism is still dominant tourism product on international tourism market.

2.2. Analysis of the impacts of COVID-19 on international tourism flows

World Travel & Tourism Council, in collaboration with Oxford Economics, created three possible tourism economic impacts scenarios – upside, baseline and downside. According to the upside scenario, visitor loss in 2020 will be 41% (international arrivals) and 26% (domestic arrivals), while total tourism related GDP in 2020 will be 2,686 bn USD lower than tourism related GDP in 2019. According to baseline scenario, visitor loss in 2020 will be 48% (international arrivals) and 27% (domestic arrivals), while total tourism related GDP in 2020 will be 3,435 bn USD lower than tourism related GDP in 2019. Worst possible scenario (downside) projects that visitor loss in 2020 will be 67% (international arrivals) and 55% (domestic arrivals), while total tourism related GDP in 2020 will be 5,543 bn USD lower than tourism related GDP in 2019 (World Travel & Tourism Council, 2020). According to Gössling, Scott and Hall (2020), in Norway, tourism, services and retail have registered the greatest decline in business due to recent pandemics, causing half of the workforce to lose their jobs.

However, despite all projection models and previous experiences, it is quite hard to predict what is going to happen with this pandemic on the global level and how will it affect tourism in the long run. As shown in table 1, during the first six months of 2020, international tourist arrivals declined by 57% globally, which is a little bit worse than predictions provided in the

downside scenario. This is the result of lockdown which might partially occurred again before the end of pandemic. However, complete lockdown with borders closing is not something that governments worldwide want to repeat again. Therefore, by the end of 2020, it is possible to expect that the number will fit into baseline scenario.

Table 1. International tourist arrivals monthly change (%) by region

REGION	January	February	March	April	May	June	YTD (%)
World	1	-16	-64	-97	-97	-93	-65
Europe	5	2	-61	-98	-96	-90	-66
Asia and the Pacific	-5	-51	-82	-99	-99	-99	-72
Americans	0	3	-49	-94	-93	-92	-55
Africa	2	1	-43	-99	-99	-99	-57
Middle East	5	-25	-45	-94	-94	-94	-57

Source: https://www.unwto.org/international-tourism-and-covid-19

As expected, highest decline was registered in Asia and the Pacific, due to the fact that in this region decline started 2 months before the other regions. As the pandemic was under control during summer months, it is possible to expect better results in that period. However, if the state of pandemic deteriorates, it will defiantly affect tourism market. It is impossible to predict what is going to happen on tourism in the next months, and "probably the only certainty for the tourism industry, and indeed for all human activities, is that nothing will be like it was in the pre-COVID-19 era" (Renaud, 2020: 687).

2.3. Changes in the process of tourism exchange caused by the COVID-19 pandemic

The difference between SARS and COVID-19 lies in the fact that WHO has stated that travel was not a contributor to the spread of SARS (McKercher and Chon, 2004), while with COVID-19 this is precisely how it was spread worldwide. Namely, Farzanegan *et al*. (2020: 4) point out the finding that "international tourism has serious consequences for the COVID-19 outbreak", especially for "major tourism destination such as France, Italy, and Spain as well as for countries with high volumes of outbound tourism such as China and the United States" (Farzanegan *et al*., 2020: 4). Moreover, "international, regional and local travel restrictions immediately affected national economies, including tourism systems, i.e. international travel, domestic tourism, day visits and segments as diverse as air transport, cruises, public transport, accommodation, cafes and restaurants, conventions, festivals, meetings, or sports events" (Gössling, Scott and Hall, 2020: 2). The effect of COVID-19 was immediate, causing decline in all segments of tourism offer worldwide. The world has gone from overtourism to undertourism within just a few days (for example, in Venice).

"Destination choice is made after constraints such as time, budget, and physical distance are weighed against destinations image" (Garg, 2015: 4). To be able to completely understand the impacts of COVID-19, it is necessary to address the importance and patterns of consumer behaviour in tourism. Namely, as previously stated, tourists tend to react less intensively on the virus outbreaks, as it happened with SARS, if they are geographically located. On the other side, with COVID-19, not many possibilities were given to travel. The first aspect – travelling, leaving the usual environment – was disabled. By the time the travelling became more liberated, the feeling of fear and uncertainty have affected people and their willingness to travel.

When it comes to China, the county in which the virus occurred and was spread worldwide, the pandemic has caused serious decline in both inbound and outbound tourism (Hoque *et al*., 2020). Moreover, *"misleading and biased media information about COVID-19 and its Chinese*

origins could put ethnically Chinese travellers at risk of perceived racial discrimination, social isolation, unequal treatment, and resultant stress or anxiety when overseas" (Zheng, Goh and Wen, 2020: 338). As one of the most important tourism markets in the world, China will most likely experience significant impacts of COVID-19 pandemic in the months to come.

However, if one considers this situation as potentially beneficial for sustainable tourism development, several conclusions can be drawn. "Although the price we are paying for this is enormous – measured in thousands of lives, millions of lost jobs, and a corresponding number of many other personal tragedies – the temporary processes of de-globalization are giving the global tourism industry a unique chance to re-boot – an unrepeatable opportunity to re-develop in line with the tenets of sustainability" (Niewiadomski, 2020, 4). In other words, it is now time to reconsider former development models and to adopt more sustainable policies. Chang, McAleer and Ramos (2020) define 10-point charter for sustainable tourism after COVID-16, aimed at establishing a balanced and sustainable tourism, travel and hospitality industry.

One has to bear in mind, though, that "it is predictable that industries such as tourism will be keen to get back to business as usual and are seeking shares of government stimulus packages and interventions" (Higgins-Desbiolles, 2020: 611). In other words, tourism might prove to be resilient to this crisis in the long run, even though the travel patterns might be changed. In other words, supply-side of the market will seek help from governments, while demand-side might respond with intraregional travels. In the end, it does not need to have negative effect on the overall system, the redistribution of tourism movement might be beneficial for certain destinations. "In light of the approximation of the social costs, relied packages should be designed to benefit the society at large in tourist destinations suffering significant negative socio-economic impacts due to the pandemic" (Qiu *et al*., 2020: 11).

Physical distancing will for sure have negative effects on tourism experiences in the future. The impact of virtual reality might become more important. "The reality of the post-COVID-19 world is that few in the academy or the industry believe in a complete return to normal so we are left with an evolving picture which is clearly moving away from 'business as usual' and towards 'transformation' but whether the tourism sector can seize the moment afforded by the present crisis remains to be seen" (Brouder, 2020: 5). If we are to embrace the new normality, we have to be able to provide appropriate response policies to newly created conditions and to enable better means of communication between tourism supply and demand in the next period.

3. PRIMARY RESEARCH ON CHANGES IN TOURISM BEHAVIOUR AS A REACTION TO COVID-19 PANDEMIC

The aim of the research is to analyse the changes in the tourism demand and characteristics of tourists' behaviour as a reaction to COVID-19 pandemic. Although the pandemic is still ongoing, it is possible to analyse the changes in tourists' opinion and behaviour during the pandemic, alongside their perception of potential changes in tourism exchange process in the post-COVID-19 period.

3.1. Methodology

An online research was carried out through Google form survey. The research was carried out during tourist season 2020, during August and the beginning of September. Statistical units of the research were domestic and foreign tourists that spent at least one summer holidays in Croatia. Questionnaire was sent through e-mail. Data obtained in the research was analyzed using the descriptive statistic method. Out of 800 questionnaires that have been sent, 154 were completed, which corresponds to a return rate of 19.25%. Among all of the examinees, young tourists (between 25 and 40 years old) dominate and they are represented with 70%. Also, in

the analyzed sample there are more women (63.6%) then men (36.4%). Most of them are highly educated tourists (78% have finished university or some higher education) with the average monthly income between 1000€ and 2000€ (58.4%) or with more than 2000€ (12%). About half of the examinees (51.9%) are domestic tourists and other examinees are coming from 14 different countries and they are evenly represented in the sample.

Prior to COVID-19 pandemic examinees have travelled mostly between 3 and 5 times per year (40.3%), while 15.6% of the examinees have travelled 5 or more times per year. 32.5% of the examinees have travelled twice a year on vacation, while only 11.7% of the examinees have travelled once or they have not travelled at all. Pandemic has had an impact on 67.5% of the examinees in the research, when it comes to realization of the planned vacation, while for 32.5% of them pandemic did not impact when it comes to changing travel plans. As much as 79.2% of the examinees went to their summer vacation in 2020. 71.4% of the examinees chose Croatia as their destination for summer vacation in 2020. Examinees outside of Croatia, mostly chose their own country for vacation, supporting the prediction that domestic tourism will dominate during the recovery period.

3.2. Research results

Due to unpredictable circumstances on the tourism market, when it comes to making decision about summer vacation, 37.5% of the examinees changed their decision about their final destination for summer vacation. Due to the favorable epidemic situation and the image of safe destination at the beginning of summer season 2020, Croatia managed to attract tourists who did not previously consider Croatia as their first choice for summer vacation. Factors which motivate tourist to travel were also examined within this research, with vacation, recreation and sailing dominating among others. Safety in destination was pointed as quite important.

Tourists who decided to travel, despite restrictions, change their typical behavior when it comes to choosing accommodation in a destination. Accommodation industry is facing new challenges that have never been faced before.

Based on the research results it is possible to analyze perception of safety level in different types of accommodation. The safeties types of accommodation in the time of COVID-19 pandemic, according to examines' perception, are private accommodation, camps and charter boat. Private accommodation, which includes private apartments in smaller facilities or vacation houses, is pointed out as the most convenient for vacation in the time of pandemic (as much as 77.92% consider this type of accommodation safe or very safe). It is not surprising because vacation houses provide total privacy and isolation during vacation. Camps are also perceived as being very safe accommodation type (62.34%). Camps can easily adapt to the new challenges in the time of pandemic because of their features - natural environment in which tourists spend most of their time outside or in their isolated accommodation units. On the other side, big cruisers are considered to be the least safe option for accommodation during vacation (66.23% consider this type of accommodation unsafe or very unsafe). Small cruisers with capacity of maximum 30 people are considered as more safe option (27.3% consider this type of accommodation unsafe or very unsafe). Hostels as a type of accommodation are evaluated as unsafe type of accommodation in the time of pandemic (only 14.29% consider this type of accommodation safe or very safe). Reasons for this result could be found in the fact that this type of accommodation is mostly chosen by young people motivated by parties and festivals. During the summer season, that segment was significantly affected by COVID-19 virus.

Table 2. Opinion on accommodation safety in relation to different types of accommodation

	very unsafe	unsafe	neither safe nor unsafe	safe	very safe
Closed resort	5.19%	7.79%	38.96%	36.36%	11.69%
Hotel	6.49%	19.48%	38.96%	25.97%	9.09%
Camping site	7.79%	10.39%	19.48%	42.86%	19.48%
Private accommodation	2.60%	2.60%	16.88%	45.45%	32.47%
Charter boat	3.90%	14.29%	27.27%	40.26%	14.29%
Small cruise boat	3.90%	23.38%	38.96%	28.57%	5.19%
Large cruise boat	42.86%	23.38%	23.38%	6.49%	3.90%
Hostel	23.38%	36.36%	25.97%	9.09%	5.19%

Hotel accommodation and tourist resorts are considered to be more safe than unsafe option for vacation. Small, boutique hotels have advantages over big hotels, because of their capacity that can faster and easily respond to epidemiological measures. In 2020, nautical tourism and private accommodation were generating majority of tourism income in Croatia. In comparison to 2019, which was one of the best years of Croatian tourism, during July and August of the year 2020, private accommodation accomplished 66%, while the hotel accommodation accomplished 44% of all overnight in 2019 (MINTIS and HTZ, 2020).

Certain elements in a destination, as well as external elements, will become more important due to pandemic experience, even after it ends. *"Unless tourism and hospitality practitioners fully comprehend how COVID-19 functions, they will likely struggle to recover from its effects"* (Wen *et al*., 2020: 3). Due to research results, the most important element is availability of health services. Almost 90% of examinees consider this element important. Element which could change the transportation structure in tourism is possibility of travelling with own vehicle, which was prominent by a majority of examinees within different questions in questionnaire. Recommendations and experiences of friends and family who have already been in destination, restrictions of number of people in indoor areas and intensity of epidemiological measures in destination are also considered important (over 80% of examinees stated their importance). On the other hand, global pandemic situation and intensity of epidemiological measures in destination are not considered quite important, as indicated in table 3.

Table 3. Importance of provided elements within tourism destination and abroad

	unimportant	not very important	neither important nor unimportant	important	very important
Availability of health care services	0%	2.6%	10.4%	40.3%	46.7%
Possibility of traveling with Your own vehicle	1.2%	3.9%	10.4%	46.8%	37.7%
Daily availability of information on number of active cases in destination	6.5%	10.4%	37.7%	28.6%	16.8%
Global pandemics situation	6.5%	16.9%	27.3%	37.7%	11.6%
Intensity of epidemiological measures in destination	1.2%	7.8%	9.1%	53.3%	28.6%
Restriction of number of people in closed areas	1.2%	6.5%	13%	51.9%	27.4%
Recommendations and experiences of friends and family who already have been in destination	2.6%	6.5%	18.2%	55.8%	16.9%

Level of prices will also be influenced by travel motives and habits. Less than 40% of examinees stated that pandemic did not influence their travel motives and habits, while more than 60% claim that it has. Some of the changes include: a) traveling by own car instead of using plane; b) avoiding public transport in destinations; c) avoiding crowded cities and places; c) staying in private accommodation rather than in a hotel; d) not visiting museums or events. Research results indicate that there are certain changes in motives and habits, which will affect the involvement in activities within destination. Research results pointed out that pandemic has influenced involvement of tourists in activities offered in destination. The majority of examinees is planning to reduce visitations to bars and night clubs (77.9%), visitations of events in destination (64.9%) and daily excursions in groups (68.8%). Instead of popular beaches with lots of activities, they are planning to search for smaller beaches without many activities. On the other hand, dining in restaurants, sport activities and shopping will be engaged in as much as before pandemic.

On the basis of literature review and available data, authors have determined several statements which could represent changes on tourism market caused by COVID 19 pandemic. As shown in table 4, the majority of examinees agree with all statements, especially with the one that tourists will be more oriented on local markets (within their region), but also within their own country, which will negatively affect international tourist arrivals, but could boost local economies in the short run. In the long run, it is possible to assume that international tourism will regain positive growth rates. Second trend (tourists will avoid crowded places during their travel) could positively affect smaller rural destinations and boost the development of special interest tourism. In the end, it will enable the implementation of sustainable tourism development criteria and sustainable products in the long run.

Table 4. Level of agreement with possible trends

	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
COVID 19 pandemic will speed up transfer from mass tourism to small scale tourism.	5.2%	56%	26%	11.6%	1.2%
Tourists will avoid crowded places during their travel.	14.3%	45.4%	26%	13%	1.3%
Many people will postpone tourism related travel until the end of COVID 19 pandemic.	16.9%	48.1%	24.7%	6.4%	3.9%
Tourists will be more oriented on local markets (within their region).	18.2%	58.4%	18.2%	1.3%	3.9%
COVID 19 pandemic will influence tourist behaviour to a large extent.	7.8%	54.5%	20.8%	13%	3.9%

Research results showed that COVID-19 pandemic has influenced tourism market not only in the short run, but will most likely continue to do so in the long run, due to changes in tourist motives and behaviour.

4. CONCLUSION

Based on the research conducted in this paper, consequences of COVID-19 pandemic cannot be compared to any other disease or disaster, due to the fact that this pandemic had literally "stopped the world" for some period of time. Therefore, it is not possible to predict what is going to happen in the next months, or even years, before the pandemic ends. COVID-19 pandemic has changed global tourism market to a large extent. Due to numerous restrictions in the transportation industry, closure of the borders and differentiated business models in majority of tourism business entities caused by epidemiological conditions and required physical distance, tourism had to adapt to those changes and provide adjusted products and services to its consumers. As a reaction to lockdowns worldwide, the number of tourist arrivals has been cut instantly with the global spread of virus. Negative economic and social effects are enormous. Summer months brought partial recovery of tourism to some destinations, but if the numbers start to rise again during the fall and winter, people will decide not to travel.

In order to analyse tourist behaviour during the pandemic and to predict that behaviour in the post-COVID-19 period, the authors have conducted primary research. According to the research results, pandemic has influenced behaviour and motivation of tourists not only during the pandemic, but will probably affect their behaviour in the long-run as well. These changes will result with new trends, such as orientation on local markets and smaller, not crowded places. Quality and availability of health services will be one the most important elements in the process of choosing the destination. Furthermore, tourists will probably prefer private accommodation or closed resorts instead of hotels. Activities within destinations will also go through certain changes to satisfy tourist needs and safety standards. Based on these conclusions, destinations should detect all possible trends and scenarios and make an effort to adopt their offer accordingly. All stakeholders in the destination should be involved in this process in order to assure positive economic and s effects for the destination and to be competitive on the global tourist market.

This research has several limitations. Primary research was carried out under the restricted conditions of circulation, without direct contact with examinees. Future research should involve more examinees, selected by dominated characteristics of group and regression analysis of the results. The biggest limitation is related to the fact that the research was carried out during the pandemic and respondents did not have a clear image of what is to happen with their travel plans in the future. Therefore, they could not adjust their travel behaviour completely. For that reason, this research should be repeated once the pandemic ends in order to be able to make strong conclusions about the changes in travel patterns and consumer behaviour. Additionally, as this is demand-side oriented research, future research should involve supply-side of the market in order to make quality conclusions about their attempts to adjust their products and services to the changes in tourists' behaviour.

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CONSUMER SATISFACTION WITH THE ORGANIZATION OF PUBLIC TRANSPORT DURING THE CORONA CRISIS

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Abstract

Public transport is a type of transporting services accessible to all users under the same conditions. Public transport between cities is dominated by airlines, coaches, and intercity rail, while in the cities and urban areas, it is serviced by city buses, trolleybuses, trams, and passenger trains. It is viewed as an essential component of the overall transportation planning and management process. Thus, public transport has become an active driver of the economic development of all modern countries. The vital role of public transport is primarily manifested in enabling affordable mobility of the inhabitants (passengers) and by that achieves a comprehensive impact on the development of society. Nowadays, the world is gripped by the global pandemic crisis that will have an enormous impact on businesses all over the world and all types of transport activities. Transportation is one of the activities most affected by this global crisis. The corona crisis has influenced and contributed to changes in the public transport system and its performances and prices. Customers had to adapt to new ways of participating in public transport, possibly new fees, and different ways of approaching public transport. The goal of this paper is to investigate the satisfaction or dissatisfaction with public transport services of Croatian customers, its availability, and new measures and ways of using public transport during the crisis.

Key words: transport, public transport, sustainability, corona crisis, consumer satisfaction, passengers.

1. INTRODUCTION

In this paper, the means and organization of public transport during the corona crisis has been analyzed. Public transport includes city buses, trolleybuses, trams and passenger trains, rapid transit subway underground and ferries, and other transport services. Public transport between cities is dominated by airlines, coaches, and intercity rail. The focus of the research is mostly based on public transport in Croatia, including the comparison with EU countries and public urban transport in the Zagreb area. The corona crisis has brought instability and new ways and methods of approaching business. The crisis has reduced the volume of economic activity all over the world, and public transportation has undergone many changes, too. Thus, traffic has experienced lots of changes during 2020 and customers have had to adapt to new ways of it. Traffic, as an economic branch, enables the process of reproduction for many products, influences the development of territorial work distribution, and plays a vital role in the development of economies in most countries of the world. Without efficient organization of public transportation, in most of cities, it would be hard to satisfy transport demand (Schmöcker, Bell and Lam, 2004). Public transport can help in maximizing productivity and competitiveness and as well it represents the key for achieving economic connectivity. It has important role in reduction of carbon emissions as it reduces usage of private vehicles (Tourism

& Transport Forum, May 2010: 1). But it is on local governments to provide with implemented measures the balance between public transport and sustainability on one side and interests of citizens on the other side (Stjernborg and Mattisson, 2016).

Pandemic caused by COVID-19 has as well affected the transport sector, and segment public transportation doesn't represent the exception. For instance in Stockholm has been confirmed decrease in ridership for almost 60% and sale of short period tickets in public transportation has fall to almost zero (Jernelius and Cebecauer, 2020). The purpose of the analysis is to collect data that will provide a better insight into the opinion users have on the currently achieved level of quality provided by public transportation in Croatia.

2. THE INFLUENCE OF THE CORONA CRISIS ON PUBLIC TRANSPORT

The corona crisis is a health crisis caused by the SARS-CoV-2 virus. It has caused the ongoing global pandemic of the corona virus disease which causes severe acute respiratory problems. The outbreak was first identified in Wuhan, China, in December 2019. The World Health Organization declared the outbreak a Public Health Emergency of International Concern on 30 January 2020 (World Health Organization, 2020). In this paper, the corona crisis will be estimated from the economic perspective. It is clear how the outbreak of the virus has caused not just problems in public health around the world, but growing concerns about the economic consequences, since in most countries, the lockdown was unavoidable to slow the spread of the virus. The impact that "pausing" the economy may have on households, businesses around the world, supply chain, financial stability of firms, the financial sector, is still unknown. The crisis caused reduction of economic activity in almost all branches, larger government debt due to the lockdown and various monetary policies being reconsidered.

This chapter's focus will be on the economic costs of lockdowns, macroeconomic expectations, and consequences, as well as the impact on tourism, transport and commodities. With these estimations, the changes in transport will be more comprehensible.

2.1. The corona crisis in general and its economic consequences

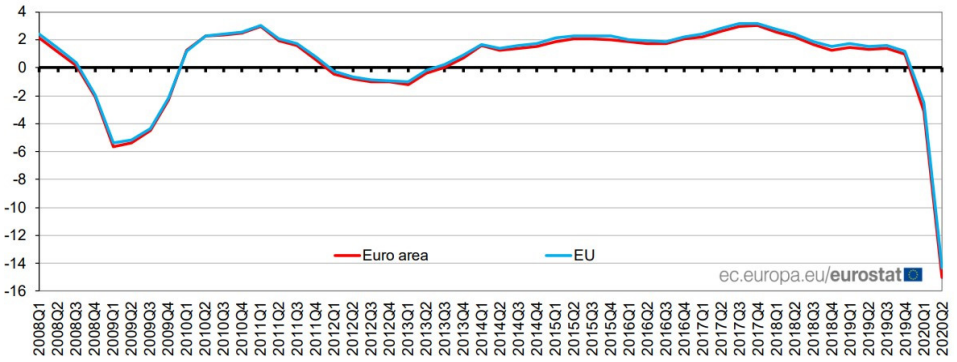
Since most governments in the world have set severe restrictions on firms in various industries, mandated social distancing and health protection policies, the supply and demand products and services have drastically changed, triggering supply-side issues. Demand in public healthcare and pharmaceutical industry has skyrocketed, and demand in industries such as restaurants, air transportation and tourism has evaporated. General buying power and consumption in private households have also been affected. Lockdown, once criticized as an authoritarian invention from China, has become the global response to contain the pandemic. A comparison of China, Italy, and the US, the three most affected countries in the first half of 2020, reveals that they defaulted to lockdown as a last resort. After delayed early interventions that could have slowed transmission, they found themselves with no choice but to order citizens to stay at home (Ren, 2020).

The most common indicator of economic activity is GDP and its estimations. It can be said that GDP is a measure of overall domestic production, and it functions as a comprehensive scorecard of a given country's economic health. The consumer spending refers to the value of the goods and services bought for or by residents of the country. Personal consumption is the largest component of GDP. It can be calculated in three ways, using the expenditure, production, or income approach. Consumer confidence has a very significant bearing on economic growth. A high confidence level indicates that consumers are willing to spend, while a low confidence level reflects uncertainty about the future and an unwillingness to spend

(Blanchard, 2009). Tourism activities, entertainment expenses, clothing and footwear, housing expenses including rent and maintenance, transportation, and debt payments including mortgages, car, and student loans had the largest declines in spending and decreased dramatically in the last few months. Gasoline also has a large decrease in dollar spending (Coibion, Gorodnichenko and Weber, May 2020).

Graph 1 shows how the GDP growth rates % changed over the same quarter of the previous year, based on seasonally adjusted data. The data for the GDP rates in the EU are available from Eurostat, the statistical office of the European Union. Compared with the same quarter of the previous year, seasonally adjusted GDP decreased by 14.4% in the EU in the second quarter of 2020, after -3.1% and -2.5% respectively in the previous quarter. Data from Eurostat also shows the impact of COVID-19 was largest in France and Italy, followed by Spain and Slovakia.

Graph 1. GDP growth rates in the EU



Source: Eurostat (31.07.2020). Preliminary flash estimate for the second quarter of 2020, *Newsrelease euroindicators*, No. 121.

Graph 1 shows that this crisis has caused one of the biggest declines in decades. Among the Member States, for which data are available for the second quarter of 2020, Spain (-18.5%) recorded the highest decline compared to the previous quarter, followed by Portugal (14.1%) and France (-13.8%). Exports fell by 4.1% for the Euro area (countries that adopted Euro as main currency) and by 3.4% in the EU, while imports fell by 3.6% and 3.1% respectively. For EU Member States, exports dropped most sharply in Finland (-8.6%) and imports dropped most sharply in Spain (-6.6%). Croatia's GDP is estimated to fall by 15% in the next quarter. Positive growth rates were only observed in a few countries, such as Sweden (+3.4% for exports) and Greece (+5.4% for imports) (Eurostat, July 2020).

The expected growth was slow to respond to the outbreak, particularly in the US, where on March 11, it was only revised down by a few basis points. The GDP expectations are revised down by as much as 10% in the US and 12% in the EU at a 4-year horizon. However, it's always hard to estimate GDP rates, especially after a large drop in the GDP and the possibility of a return not the right way to interpret movements in the stock market. Large sharp declines do not necessarily mean that such a position will be maintained for years and with good economic measures, a bounce can be expected soon. Governments and central banks all over the world are trying to find a solution to stop employment rates from further falling and trying to push consumer spending (Gormsen and Koijen, March 2020).

Another important economic indicator is employment/unemployment. Due to the crisis, 22 million people in the United States have lost their jobs, unemployment rates more than doubled

in Austria, and 29% of all Swiss employees have been put on short-term furlough. Workplace closures have an immediate and severe impact on enterprises and own-account workers. For those that are engaged in global supply chains, disruptions are likely along the forward and backward linkages of the chain as other countries continue to face reductions in economic activity. Restarting businesses is requiring significant adjustments with cost implications and securing safe work environments. The crisis is causing an unprecedented reduction in economic activity and working time. The estimates of hours lost for the first quarter stand at 4.5 per cent (equivalent to approximately 130 million full-time jobs, assuming a 48-hour working week) compared to the pre-crisis level (the fourth quarter of 2019). These estimates have a substantial degree of uncertainty: whereas labour force surveys for the first quarter are available for some countries, for others the data are incomplete, and for many countries no data are available at all. Unless tackled by effective policies, these new requirements are likely to put a severe constraint on businesses (International Labour Organization, 2020).

The ILO also indicates four key pillars to fight COVID-19 based on International Labour Standards. It is important to know that the consequences of the crisis will be shown in a few months or years in the number of the unemployed, consumer price index (CPI), but also in all other measures such as reducing working hours. To protect both enterprises and employment, the ILO suggest the four pillars.

Table 1. Four key pillars to fight COVID-19 based on International Labour Standard

Pillar 1: Stimulating the economy	**Pillar 2: Supporting enterprises, jobs and incomes**
• and employment • Active fiscal policy • Accommodative monetary policy • Lending and financial support to specific sectors, including the health sector	• Extend social protection for all • Implement employment retention measures • Provide financial/tax and other relief for enterprises
Pillar 3: Protecting workers in the workplace	**Pillar 4: Relying on social dialogue for solutions**
• Strengthen OSH measures • Adapt work arrangements (e.g. teleworking) • Prevent discrimination and exclusion • Provide health access for all • Expand access to paid leave	• Strengthen the capacity and resilience of employers' and workers' organizations • Strengthen the capacity of governments • Strengthen social dialogue, collective bargaining and labour relations institutions and processes

Source: International Labour Organization (2020.) COVID-19 and the world of work.

Decreasing consumer demand and spending may even worsen throughout 2020 with upcoming corporate layoffs and bankruptcies in many affected sectors. At the same time, many industries face supply-side issues, as governments reduced the activities of non-essential industries and workers are confined to their homes (Kraus, Clauss, Breie et. all; May 2020).

Tourism market is a set of supply and demand relations in the field of services and goods that serve to meet the tourist demand in a particular area. Tourist supply is dislocated from the tourist demand and tourists are the ones who have to travel to the place of the tourist offer. This is the main link between transport and tourism, tourists must travel to reach their destination (Čavlek et al, 2011).

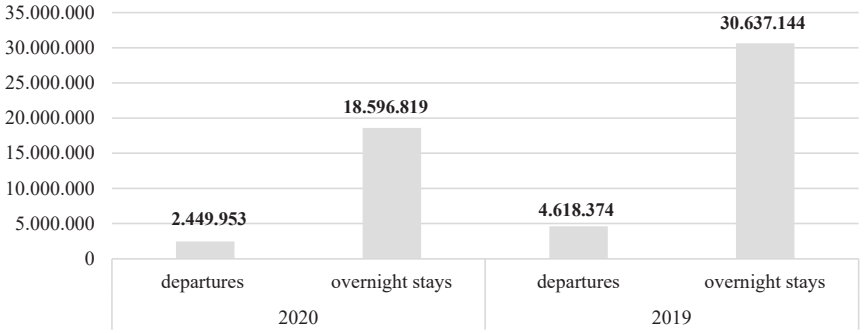
Since the beginning of the pandemic, travel restrictions spread out from China and the epicentre Wuhan to many countries by the end of March. Gössling, Scott, and Hall (2020) estimated that over 90% of the countries have had some level of international travel restrictions and many of these countries also have some degree of restrictions on internal movement, including limited air travel and stay at home orders. All countries have implemented at least some travel restrictions, and this unprecedented response, like closing the borders in a wide range of industrialized countries to all foreign nationals, and virtually, including travel bans from selective countries, arrival quarantines, and/or health certificate requirements. With such a situation in the world, for tourism industry, the year 2020 is one of the worst years in decades. Travel bans from selective countries, self-isolation, and health certificate requirements have reduced passenger motivation and tourism has slowed down significantly, with the number of global flights dropping by more than half.

Large tourist countries in which this industry plays a major role in GDP like the USA, Brazil, the UK, Russia and many Asian countries, at one point, completely closed their borders to tourists. In all countries, guest numbers have declined significantly, by 50% or more. The hardest hit was received by the countries heavily exposed to the, like Italy, as well as the countries imposing drastic measures to restrict movement in the population, like Greece and Germany. Countries that appear to have fared better are the Seychelles, Sweden, New Zealand. They haven't had rigorous restrictions and may still hope to have solid number of visitors, with tourists considering riding out the crisis in countries perceived as safer. However, even in those situations, tourists are being asked by many countries to return home.

Data from the European Commission (13.05.2020) reflects the contribution that tourism has in the EU GDP and it is close to 10%. Countries like Croatia, where tourism has almost 18% contribution in the GDP, could not afford extreme lockdowns as tourism ecosystem covers a range of activities such as travel, transport, accommodation, food, recreation on land and water, culture or nature. Tourism is the fourth largest EU export category. In economic jargon, 1 EUR of value-added generated by tourism results in an additional 56 cent of value added in indirect effect on other industries. Tourism is the backbone of the economy for many EU countries. Portugal, Greece, Croatia, and Cyprus have the highest percentage of total employment compared to the number of jobs in the tourism sector (European Commission 13.05.2020). Regions across Europe differ in terms of their reliance on tourism activities. The impact is strong on islands, coastal and outermost regions, due to their dependence on tourism activities or reliance on international air travel. Rural areas, with limited connectivity and dependence on tourism, have also felt a strong impact.

Throughout the paper, the emphasis is placed on Croatia and its indicators. The next chart shows departures and overnight stays in June of 2019 and 2020. One of the characteristics of Croatian tourism, as well as many countries', is the seasonal character, so the figures from July 2020 will help to see the consequences of the corona crisis on Croatian tourism.

Graph 2. Comparation of departures and overnight stays in Croatia in July 2019/2020



Source: Hrvatska turistička zajednica (July 2020). Informacija o statističkim pokazateljima turističkog prometa - srpanj 2020.

During July, 78% of tourist traffic was registered in commercial accommodation facilities, 19% in non-commercial accommodation facilities, and 3% in nautical charter. Due to the global corona pandemic virus (COVID-19) as well as the consequences of protectionist measures at the level of most countries in the world, Croatia recorded a decline in tourism in July turnover from all relevant markets. The decrease in the number of overnight stays compared to 2019 is in the absolute amount of 12,040,325 and, in the relative amount, that number is about 40%. The smallest decline was recorded in the markets of Slovenia, Germany, Poland and the Czech Republic. Many manifestations, and other events that require a large number of people in one place have been postponed due to corona crisis, so the expectations of this year's Croatian tourist season have been exceeded. Compared to the expectations from March and April 2020, the time of lockdown in many countries around the world, the tourist season in Croatia has turned out surprisingly good (Hrvatska turistička zajednica, srpanj 2020).

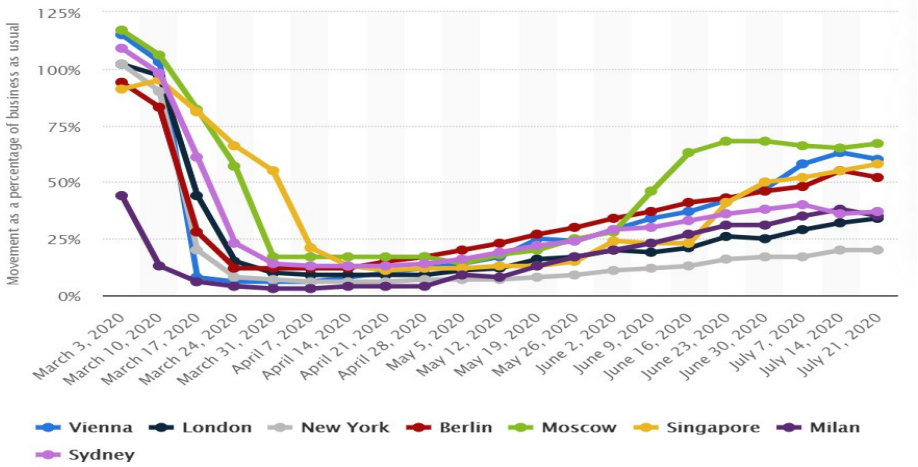
By analysing some of the effects of the pandemic on tourism, it can be concluded that transport has suffered the greatest losses and it is the most affected branch by this crisis. As a consequence of the COVID-19 pandemic outbreak, important supply chains in the logistic and transportation industry are hampered, though differently across air, freight and sea sectors. One estimated economic impact of COVID-19 on the global logistics industry is a decrease of 6.1 percent in gross value added by the logistics industry. The estimated impact of COVID-19 on logistics markets varies across countries, from a 0.9 decline in China to 18.1 decline in Italy. The global freight forwarding market is expected to shrink by 7.5 percent at worst in 2020 compared with 2019. In a severe impact scenario, the North American sea and air freight forwarding market is expected to contract by 12.1 and 9.5 percent respectively in 2020 compared with the previous year. COVID-19 also affected freight traffic in the US. Rail traffic in the United States was hit the hardest in April 2020, with 25.2 percent less carloads being transported compared with the same month the year before (Mazareanu, 20.10.2020).

Public transport has been suffering huge blows during the corona crisis, especially during the quarantine period in April and May. During the quarantine, public transportation in large cities was nearly disabled or extremely reduced in scope. Public urban passenger transport is the lifeblood of cities, so it is desirable to keep the services running as long as possible, but in most countries, reducing the volume of public transport was a strategy to reduce the spread of the virus. The reduction in the volume of public transport was particularly felt by the employees in the sector. The result will extend from the money generated by ticket sales and parking, to

vending machines and transport fines. Lawrence and Granath (19.03.2020) indicate that the financial implications of COVID-19 could be up to £500m in public transport in London. Most of the public transport and rental services companies suspended their services during the lockdown. Automobile executives also found that people would prefer to buy their own vehicles in the future because the perception of the hygiene conditions is likely to change.

Graph 3 clearly suggests the impact of the corona crisis on public transport in big cities around the world. The data shows the mobility expressed in percentages in Vienna, London, New York, Berlin, Moscow, Singapore, Milan and Sydney.

Graph 3. Mobility in selected cities between March 3, 2020 and July 21, 2020, compared with movement prior to the coronavirus outbreak



Source: Statista Research Department (2020). Mobility in cities amid coronavirus crisis 2020.

In every city, the fall of the movement of public transport was rapid. At the time of this paper being written, restrictions are being lifted, mobility is on the rise among urban areas. One of the negative conclusions concerning the public transport is that negative trends can jeopardize their sustainability. Most people will avoid travelling, and only those who must, will travel. Other reasons for the decline in public transport are strict measures to sustain the spread of the virus.

2.2. Customer satisfaction and organization of public transport during the COVID-19 crisis

Daniels and Mulley (2013) explain that reasons for using public transport are spatial access, cost, physical accessibility, information and attitudes, which all contribute to people's ability and motivation to use public transport. Walking distances play important role in customers' choosing public transport; rail stations are usually not within a walking distance as often as bus stops are. Among walking distances, there are a lot of factors that influence customer satisfaction with public transport. Waiting time at the stop, journey time on the bus, vehicle occupancy, the cleanliness of the vehicle, the driver's kindness, the comfort of the vehicles are some of the factors that Dell 'Olio, Ibeas and Cecin (2011) list.

When assessing customer satisfaction, there are several parameters to consider (Naletina, Bugatin and Rajič, 2019):

1. Satisfaction is a dynamic process that is continuously changing, depending on the level at which the demands have been satisfied, on the changes in the expectations, the changes in the subjective and the objective environment of the passenger.
2. There is no general level of user satisfaction; it is, instead, the sum of individual values that only presented as a whole give the level of satisfaction of the passengers as individuals; passengers' satisfaction is the average value of individual expectations and emotions.
3. Satisfaction is a relative concept. Users' loyalty cannot be maintained even if they feel satisfied. Even satisfied customers leave at some point.

According to the scientific literature, several main determinants of user satisfaction with public transport will be listed (Trbušić, 2005):

- availability: the scope of the service offered in terms of geography and time and frequency.
- accessibility: access to a system that includes connectivity to other modes of transport
- information: systematic provision of information to assist passengers in their travel and planning
- time perspectives that are important for travel planning
- relation to passengers means achieving the greatest possible compatibility between the standard of service and any requirement of each individual user
- comfort: elements of the service introduced with the intention of making the journey more relaxing
- safety: the passenger's sense of personal safety designed to ensure that the user is aware of them
- environmental impact: impact on the natural environment as a result of the operation of the public transport.

Since the COVID-19 outbreak, the impact of public transport, transport of cargo and connectivity in the EU has been enormous. Measures to contain the outbreak have resulted in a dramatic reduction in transport activity, especially in passenger transport. Freight flows have been less affected, in part thanks to the collective EU efforts to ensure that freight continues to move, although there has been a reduction due to declining economic activity and disruption of supply chains. Protecting transport workers means not just protecting their health, but also protecting their jobs in transport industry. Transport workers in all modes have played a critical role in the crisis in delivering freight, supporting the functioning of supply chains, repatriating EU citizens, and transporting essential workers to their jobs, even at heightened risk to their own health and wellbeing. Transport workers who are required, due to the nature of their work, to have a high level of interaction with others (e.g. aircrews, security and safety inspection personnel at airports and ports, ticket controllers, bus and van drivers, passenger vessel crews, maritime pilots, staff providing assistance to passengers, including persons with disabilities and reduced mobility) should be provided with the appropriate level of personal protective equipment, as further outlined below. Regular changes of such equipment should be ensured as necessary, as well as their safe disposal. Protecting passengers is the priority of all public transportation companies and their sustainability depends on it. Measures to limit contact between transport workers and passengers, as well as between passengers are wearing personal protective equipment (masks, gloves), reducing, where feasible, the density of passengers in collective means of transport and in waiting areas, and setting up dedicated lanes or otherwise separating different passenger flows at transport hubs (i.e. ports, airports, train stations, bus stops, ferry landings, urban public transport hubs, etc.) (Official Journal of the European Union, 15.05.2020).

To summarize all the measures that have been issued by the European Commission and the Croatian Civil Protection Headquarters for public transport. there are the most important measures and recommendations to be followed in public land transport, as well as maritime and air transport. Recommendations for using Bus/Rail:

- Driver's seat hygiene. Maintain the hygiene of the driver's cab and your work environment - the driver's seat and the cab, by wiping the surfaces with a surface disinfectant on daily basis, preferably several times a day.
- Driving with a mask on.
- Maintain hand hygiene regularly. Whenever possible, wash your hands with soap and water for 20 seconds. If this is not possible, use disinfectants that contain 70% alcohol.
- Touching the face. Avoid touching your eyes, mouth and nose with your hands, as this way the virus can enter the body.
- Contact with passengers. Close contact with passengers and their luggage should be avoided when communicating with them. Maintain an appropriate body distance (1-2 meters) in daily social contact with passengers and other people.
- Social distance. Inform passengers of the importance of maintaining a body distance of at least one meter from each other. Observe the measures, especially if you notice passengers with respiratory symptoms.

Service quality will be evaluated by considering customer perceptions and expectations, or by a range of simple disaggregate performance measures which can be used for measuring the ability of the company to offer services that meet customer expectations. Customer satisfaction is a key factor for the successful long-term survival of any company on the market and, equally, it can be seen as a competitive advantage. Therefore, it is necessary for the company to regularly monitor customer satisfaction (Kral, Janoskova and Kliestik, 2018).

All these measures make it very difficult to use public transport. These measures have especially affected tourists and tourist arrivals in Croatia this season. There is no doubt that public transport will change greatly during the virus period and the issue of its viability and customer satisfaction will be elaborated in detail in the following chapters. The importance of customer satisfaction is generally needed for the long-term success of the any company and for any mode of public transport in the current market environment.

2.3. Sustainability of public transport during the corona crisis

Sustainability in economic terms focuses on meeting the needs of the present without compromising the ability of future generations to meet their needs. The concept of sustainability is composed of three pillars: economic, environmental, and social.

The corona pandemic has imposed the question of sustainability of public transport. People are afraid, with good reason, to travel by public transport, and there is concern that the public will reject public transportation in favour of private motor vehicles. A study in Hubei showed that COVID-19 spread from one person to nine over the course of a single long-distance bus journey. It is estimated that if customers have a choice, they prefer to use their own cars, or taxis that are regulated with virus-free drivers and deep cleaning. Busses and trains are regulated to carry fewer and more dispersed passengers, public space is needed to disperse the ingress and egress at stations and bus terminals, and installations will need frequent disinfection and cleaning. Steps in this direction can already be seen in Wuhan, Kigali, Rome, Milan, Washington DC, Hong Kong, Istanbul and elsewhere (Honey-Roses et al., 2020).

Murray (2001) provides determinants of how to make public transport sustainable. Public transport services would require:

- more effective price structures;

- enhanced travel comfort;
- better suitability and convenience of service quality;
- reductions in travel time-efficiency; and
- increased service access.

The corona crisis that has befallen the world in 2020 has prevented the implementation of many sustainability determinants. More effective price structures can be sustained only if a price is above their unit costs, and all operational cost have to be payed if company wants to survive in the long run. The economic crisis resulting from this health crisis will increase the debts of many companies, and state support will be needed. On the other hand, public transport companies will have to concentrate on other determinants of sustainability in the next year to two. Providing access to public transportation performance measures expressly is recognized in most regional transportation plans in most developed cities in Europe and Croatia. The goal is that all residents of cities and rural areas are close to the public transport stations. By enhancing travel comfort, transport services must provide comfortable journey by better access to the seat, reducing noise levels, courteous drivers, air conditioning. Also, by ensuring constant frequency of public transport between cities during the tourist season, by providing information about routes, including the time spent waiting, the sustainability of public transport can be restored. The way to persuade customers to choose more sustainable options is to provide a public transport system which is faster and at least as safe, secure and reliable as personal mobility. The estimation from the work of Fiorello, Nökel and Martino., (2018) shows that public transport uptake is much more pronounced in urban than extra-urban contexts due to the generally higher level of service for public transport and lower level for private transport.

Buehler and Pucher (2011) emphasise that two main reasons for improved financial performance of public transport in Germany are reduced costs and increased revenues. European transport financing legislation in the early 1990s focused on increasing efficiency in transit and made some policies about public transport regarding financial sustainability. To increase revenue, public transport agencies have increased collaboration with regional partners in regional transit agencies. Also, they have promoted regional monthly and annual transit passes for all social groups, making public transport more popular. Transit agencies have also increased the quality of their vehicles, stations, and other services, with a focus on customer convenience, but have also increased the fares. Local governments have limited car travel speed, clustered new development around transit, and coordinated their transport and land use plans. One of the important lessons for improving public transport is the involvement of the private sector and encouraging competition. Good example of that is the case in Germany where partial liberalization of the regional rail market, increased competition, attracted new rail companies, and resulted in an increase in the level and quality of German regional rail service. With the influence of the private sector in business, the only way of sustainability is financial stability. In the future, one way to maintain public transport is to influence private benefits.

All modes of transport have recorded a significant decline during this crisis. It is clear that air transport is the most affected sector, with more than 90% of programmed flights in the EU cancelled. Air transport is most affected for several reasons. One of them is the risk of staying in the destination and complications during the return home, the perceived sense of exposure to diseases when travelling in airplanes, or the inconvenience caused by additional airport controls. In addition, in a context of a potential economic slowdown, overall demand would decrease even further, making the medium-term prospects of the sector even more questionable. Passenger car traffic has decreased from 60% to 90%, while public transport and passenger rail decreased by more than 50% in most Member States. The freight sector is more resilient, since supply chains were mostly kept open to support the continuing productive operations. Data from the European Commission shows optimistic estimations for high speed and conventional

rail. Trips in the 400 km to 1000 km distance band will probably not be affected as much as longer distance trips by air, and rail may benefit from the substitution effect. However, trips that require indirect connections through intermediate stations or combinations of more than one transport modes are likely to be less attractive to travellers (European Commission, 2020).

Redman et al. (2013) focus on improvement strategies to public transport. They indicate that reliability, frequency, price, speed, access, comfort and convenience are the best determinants to increase the scope of and improve public transportation. Their study also provides solution for public transport system to compete with cars. It is most likely that car users will find public transport attractive for attributes over and above basic mobility attributes, in as much as access to a car already provides these benefits. A basic level of access, reliability and competitive costs must be provided by public transport services to meet that already offered by a private motor vehicle.

Limits to the number and density of passengers and personnel in the vehicles, vessels and aircraft (and stations, ports and airports) should be expected in the next years. That will, however, include the reduction of passengers who travel, and all restrictions listed in the previous chapter. Measures and recommendations useful for public transport will be necessary in order to minimise the potential spread of future waves of infectious diseases and to provide a sense of security to the users. This might increase the cost of the service and other limitations for transport operators. The European Commission indicates that one of the ways to stimulate public transport is to introduce innovative processes in vehicle manufacturing. Also, this includes the start-up ecosystem of new mobility options and business models or high uncertainty concepts such as the hyper-loop (European Commission, 2020).

The next few years will be challenging for all modes of public transport, as well as cargo transportation. Customers mobility and fast transport between cities and places is still required in many jobs. New ways of ensuring logistic flow will have to be provided in the order for public transport to compete with private vehicles. Early evidence suggests that transport efficiency is not necessarily improving. New mobility solutions such as car sharing, ridesharing and ride-hailing services are making cars even more appealing and demand for them will very likely rise in the time of pandemic.

3. RESEARCH METHODOLOGY

3.1. Review of existing literature

Numerous papers deal with the analysis of public transport and research of user satisfaction. Therefore, the most important findings from some research papers will be presented, with the aim of discovering customer satisfaction but also its improvement and further sustainability, especially during the corona pandemic. In Croatian literature, there are a number of papers dealing with consumer satisfaction with public transport, their organization and impact it has on economic and traffic development. Naletina, Butigan, and Rajič (2019) conducted a research on passenger satisfaction with the public transportation service in the city of Zagreb. Passenger satisfaction rests on several factors. The price of the service is the most common factor that is satisfactory in public transport in the City of Zagreb. Other determinants of passenger satisfaction are safety during the ride and information about the transit. On the other hand, the most dissatisfying factors in the research are crowded vehicles, questionable cleanliness of the vehicles, often delays, and not adhering to the schedule. It was concluded that the traffic system in Zagreb is characterized with the presence of a large number of personal vehicles and dissatisfaction with the current state in public transport. Also, it is estimated that

the overload of passengers surpasses traffic capacities moving through city centre. Most of the passengers are pensioners and students traveling to school.

Brčić and Slavulj (2014) emphasize the advantages of public Zagreb transport, such as high operational capacity, the possibility carrying many passengers, environmental acceptability, spatial rationality, and economic sustainability. They also deem public urban transport the backbone of urban mobility. The aim of their research was to identify irregularities in the transport process on the characteristic bus lines that affect the attractiveness of bus traffic. The study involved seven bus lines in different parts of the city on which GPS locators were installed. As the two biggest problems in Zagreb, the authors point out the weak separation of buses from other traffic and the lack of advantages of passing buses through traffic lights. The conclusion was that, in the centre of Zagreb, there is traffic congestion due to many cars. Also, the authors noticed that the speed of the bus grows operating further away from the city centre, so the city bus lines have a speed of 15.8 km / h, and the suburban lines 21.2 km / h. Increasing the operational speed would contribute to the attractiveness of public urban transport and modal redistribution in favour of public urban transport, and thus sustainable urban mobility would be achieved.

Kral, Janoskova, and Kliestik (2018) investigated the relationship between the sociodemographic characteristics of the respondents and the intensity of public transport use. Due to the assumption that public transport loses its attractiveness and competitiveness in relation to alternative means of transport (most often own-account transport), the research tried to identify the factors influencing the decision-making of current and potential passengers in suburban bus transport. Given demographic characteristics, age is a significant variable that affects the intensity of suburban bus use. One of the conclusions is that the increase in the level of education and the net monthly income of the respondents is reflected in the decrease in the regularity of the use of suburban transport. Moreover, the research concludes that one of the threats to transport companies is a long-term decline in performance, which mainly leads to the shift to own-account transport. Public transport companies have to devise an offer that satisfies the needs of passengers. This is possible by providing marketing aimed at regularly monitoring the constantly changing behaviour of customers and knowing their requirements.

A study by Chica-Olmo, Gachs-Sánchez, and Lizarrage (2018) intend to design a model for satisfied user who is satisfied with certain group factors in transport, considering individual user characteristics and different performance of different bus lines. In the analysis of the satisfaction of the Metropolitan transport company in Granada in 2013, a survey of satisfied users of the services of the city transport year was used. This research identified the factors that contributed to the design of the public transport satisfaction model. The key dimensions of the indicators are reliability, responsibility, sensitivity, the behaviour of people, attitudes, and skills of those involved in the provision of services, security, opportunity, ease of information, comfort and cleanliness, and frequency.

3.2. Research method

For the purposes of writing the empirical part of the thesis, a primary research was conducted, with the aim of determining consumer satisfaction with the organization of public transport during the pandemic. A highly structured survey via Google Forms was used as a research tool. The survey was conducted from August 26 to August 30 and involved 107 respondents. Respondents filled out the survey online, through social media network or e-mail.

The research was conducted on respondents from the area of the city of Zagreb and its surroundings. Since all respondents to this survey are from the city of Zagreb, the satisfaction of public transport was reflected in the companies of the Zagreb Electric Tram (ZET), Croatian Railways (HŽ) and several other companies engaged in passenger transport to the suburbs part of Zagreb such as Velika Gorica, Zaprešić and Samobor.

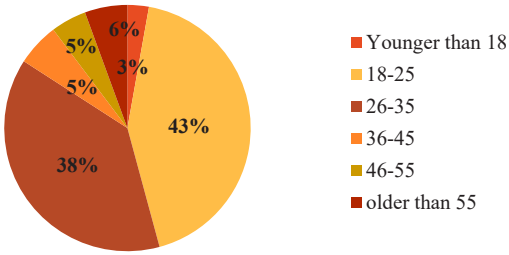
The first part of the survey included five question on demographic characteristics with only one answer possible. The second part of the survey was a set of multiple-choice questions that aimed at answering some of the segments of public transportation satisfaction and dissatisfaction. The third part of the survey consisted of statements related to passenger satisfaction with transport by which respondents were asked to indicate the degree of satisfaction, where answers are: 1 - strongly disagree, 2 - disagree, 3 - neither agree nor disagree, 4 - agree, and 5 - strongly agree. The aim of the research was to analyse the obtained data and draw conclusions about satisfaction or dissatisfaction with public transport from the perspective of passengers, to determine the most important reasons for satisfaction or dissatisfaction during the pandemic and to assess the sustainability of public transport by assessing passenger satisfaction.

3.3. Research results

The first set of questions was to determine demographic characteristics of passengers. Out of 107 respondents, 50 are female (46.7%), while 57 (53.3%) are male.

Graph 4 shows that the largest number of participants in the survey are between 18-25 years old, 46 (43%). This is followed by respondents from the age group of 26-36, or 41 people (38.3%). Other respondents are between 36-45 years, only 6 of them (5.6%), and five people (4.7%) in the age range between 46-55. The smallest number of respondents is under the age of 18, 3 of them (2.8%).

Graph 4. Structure of respondents by age



Source: author-compiled based on collected data

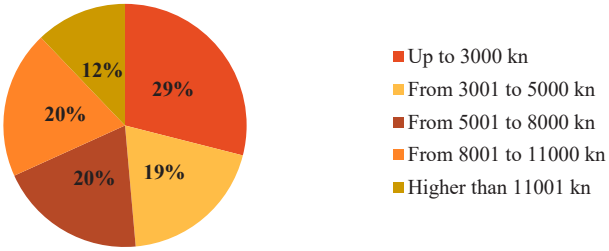
Most of the respondents to this structured survey have high education. 44% of respondents have a master's degree, while 26% of respondents have a bachelor's degree. 26% of the people participating in the survey have finished high school while only 1% have finished just

elementary school. 3% of people have PhDs. When the number of respondents who have some kind of academic education is added up, the number reaches 73%. It is known that educated people have a greater source of income and thus, greater purchasing power. A review of existing research has shown that people with higher incomes are likely to use other means of transport and use public transport less frequently.

Related to the employment status of respondents, most of them are employed (51%), while the respondents who study, although they can work through a student contract, are not shown as employees. Their percentage in this survey is 36, while unemployed respondents make 8 percent in the total number of people taking the survey.

Graph 5 shows the total monthly income of the respondents. The largest number of respondents have incomes up to 3,000 HRK, as many as 29%, so it can be concluded that this number of respondents has the status of a student. 19% of respondents said they had a monthly income between 3001-5000 HRK.

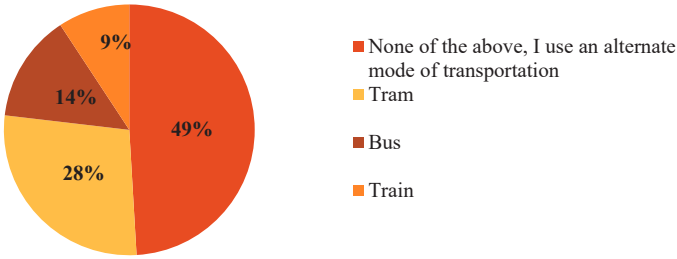
Graph 5. The amount of monthly income of the respondents



Source: author-compiled based on collected data

There are 20% of the respondents who have a monthly income between 5001-8000 HRK, and also, 20% of the respondents have a salary between 8001-11000 HRK. It is concluded that those respondents are permanently employed and are likely to use public transport occasionally. 11% of the respondents have a monthly income higher than 11,0001 HRK, which is a high income for the Croatian standards.

Graph 6. The most commonly used public transport vehicle during the pandemic

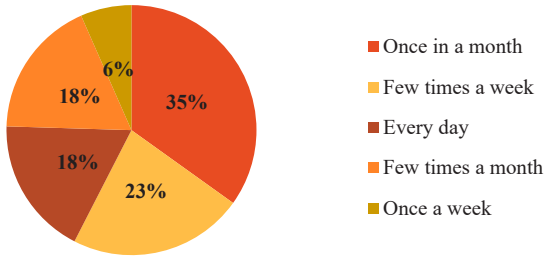


Source: author-compiled based on collected data

It is noticeable on Graph 6 that almost half of the respondents (49%) answered that, during the pandemic, they, most often, have used alternative modes of transport and do not use public transport for everyday activities. It is concluded that these respondents are employed and that

they own their own vehicle, or most often, use other forms of transport. 28% of the participants in the survey have used the tram as most common mode during the pandemic, while 14% have use the bus. The smallest number of the respondents have used train (9%), and they are very likely to live in the suburbs of the city.

Graph 7. Frequency of travel by public transport during pandemic



Source: author based on collected data

35% of the respondents have used public transport just once a month during the COVID-19 pandemic. It is noticeable by this answer that many respondents use alternative mode of transport, as can be concluded from the previous graph. 18% of the respondents use public transport few times a month, while 23% of the people who participated this survey answered, "few times a week". 18% of the participants use public transport every day, and most of them are very likely students who travel to university and back home. Only 6% of the respondents said that they travelled by public transport once a week. It can be concluded that public transport services are mostly used once or a couple of times a month, and that the respondents are more likely to avoid using public transportation during the pandemic. Compared with the research of Kral, Janoskova and Kliestik (2018), one can conclude that age plays an important role in the daily use of public transport.

Graph 8. The main reason for using public transport during pandemic

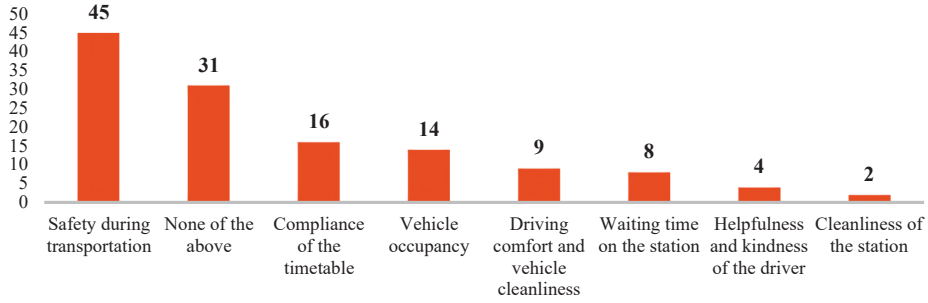
Source: author-compiled based on collected data

The question *"What is your main reason for using public transportation during the COVID-19 crisis?"* was answered by 106 respondents and most of them, 34%, have been using public transport in free time/ for meeting with friends, etc.". For 26% of the respondents, the main reason for using public transport is "going to work", and 23% of the respondents use public transport for going to school or university and 14% of people for other purposes. Only 3% use public transport when they go "grocery shopping".

The next question, *"Which parts of the city do you most commonly travel to?"* was answered by all of 107 participants and 84 of them said that they used public transport in Zagreb to travel to city centre. Only 23 participants use public urban passenger transport in suburban area. It is concluded that most respondents live in a part of the city closer to the centre than to the suburbs such as Velika Gorica, Samobor, Zaprešić and other nearby places. Although they are considered separate cities, they are very well connected with Zagreb and are considered suburbs.

Graph 9 concerns passenger satisfaction with some of the determinants of public transport around the city of Zagreb. It was possible to answer this affirmative question with a multiple number of answers, and the results show which determinants inspire satisfaction and which provoke user dissatisfaction.

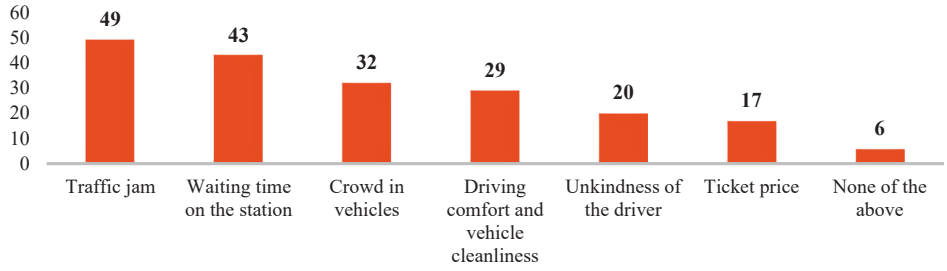
Graph 9. Determinants of satisfaction with the services provided in public transport



Source: author-compiled based on collected data

Based on collected data, consumers are most satisfied with safety during transportation. It is a well-known fact that passengers feel safer in public transport than traveling with other means of transport. Previous research and a large number of authors state that the safety of public transport is one of the advantages and this has been proven in this research as well. The next answer most used by the respondents is "none of the above". This answer is a reminder that many people find no satisfaction in public transport service in the city of Zagreb. "Compliance to timetable" is the third factor consumers are most satisfied with. The next factor of customers satisfaction is "vehicle occupancy." It is noticed, however, that the respondents estimated that during the pandemic, the number of passengers in public transport decreased a little. "Driving comfort and vehicle cleanness" is the next factor of passengers' satisfaction, while "waiting time on the station" is one of the determinants that consumers are not excessively satisfied with. "Helpfulness and kindness of the driver" and "cleanliness of the station" are the components that passengers are least satisfied with. Only 10 respondents believe that adherence to the timetable is satisfactory, while an almost negligible number of people think that drivers are decent, and fewest respondents are satisfied with the cleanliness of stations. Compared with the research of Naletina, Butigan, and Rajič (2019) on passenger satisfaction with the public transportation service in the city of Zagreb, similar results are obtained on public transport safety. It can be concluded that the satisfaction with public transport in Zagreb still depends on an important factor and that is the safety during transportation and then follow other factors such as the number of people in the vehicles and cleanliness.

Graph 10. Determinants of unsatisfaction with services provided in public transport



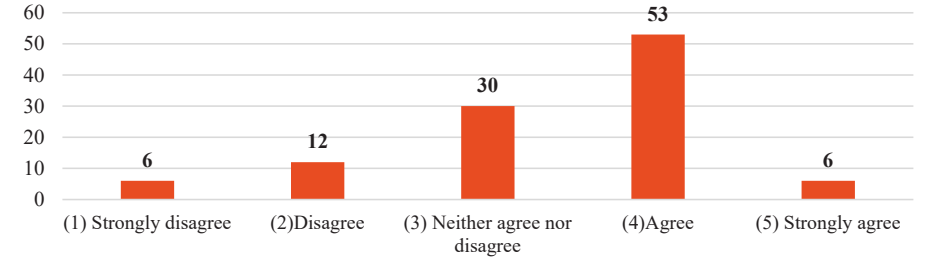
Source: author-compiled based on collected data

The question *"What segment of public transportation are you most dissatisfied with?"* was a multiple-choice question. The most common answer was "traffic jam" as the most dissatisfying determinant which distracts people from using public transport in the city of Zagreb. Waiting time on the station is the second biggest factor that the respondents choose as a determinant of dissatisfaction with public transport in Zagreb. One reason is that public transport in Zagreb has decreased during the pandemic, like in most cities. "Crowded vehicles" or congestion of public transport is also an important factor of passenger dissatisfaction. Ticket price is one of the last reasons of dissatisfaction, so it can be concluded that the price of public transport tickets in Zagreb is not a big factor of dissatisfaction. It can also be concluded that a large number of people in vehicle discourages consumers from using public transport. Possible reasons are protection measures against COVID-19 to maintain social distance to help and prevent the spread of the virus.

The last part of the research consisted of assessing satisfaction with the statements, rating them from one to five, with 1 being strongly disagree, and 5 being strongly agree. The first statement was answered by all 107 responders.

The statement "The availability of public transport during the pandemic is satisfactory" was agreeable for most respondents. Almost 30% of them (32) are indifferent assessing the availability of public transport in Zagreb during the COVID-19 pandemic. Also, there are passengers who strongly disagree with the previous statement, and 14% disagree. Almost the same ratio of respondents strongly agrees with the statement (9%), so, it is concluded that the availability of transport during the pandemic in Zagreb is still satisfactory for the users of public transport.

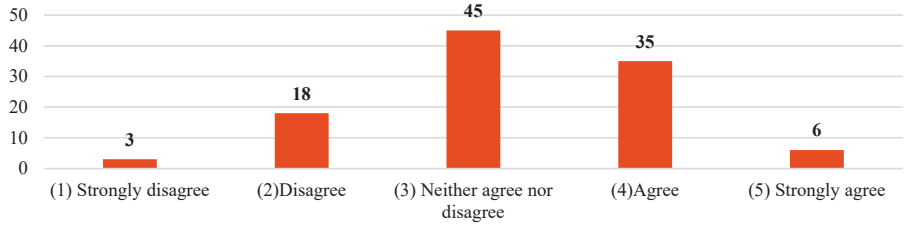
Graph 11. Passengers satisfaction (agreeableness) with public transport during the pandemic



Source: author-compiled based on collected data

46% of the respondents agree with the statement "The information about public transport is available during the pandemic", and 5% strongly agree. This includes more than 50% of the respondents who agree that the information is available to all users, so it is concluded that users are still satisfied with the information they receive. 30 responders neither agree nor disagree with this statement and 12 of them disagree. Six respondents gave the lowest score on public transport information during the pandemic.

Graph 12. Passenger satisfaction with comfort in public transport

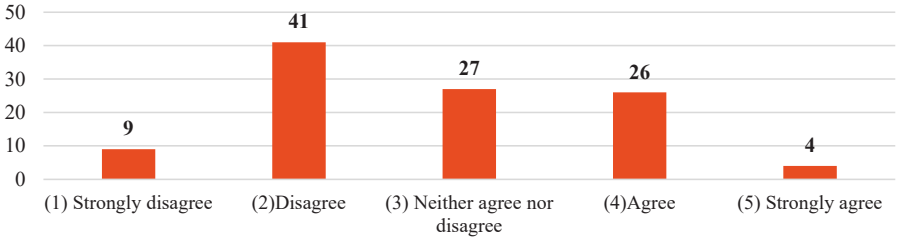


Source: author-compiled based on collected data

The research continued with the comfort with public transport during traveling. Most of the respondents are indifferent about that statement, with 42% neither agreeing nor disagreeing that comfort in public transport during the COVID-19 crisis is satisfactory. However, interesting information is that the respondents assessed that traveling comfort is rather good, with 35 agreeing with statement. 18 respondents (almost 17%) disagree, while similar number of people strongly disagree and strongly agree.

Graph 13 gives important information about their sense of security when traveling by public transport. The statement "I feel I am safe from contracting COVID-19 during travelling" was assessed negatively by most, which means that fear from the pandemic is still high when traveling with public transport. It is very likely that protection measures from COVID-19, which apply to indoor areas with a lot of people and air conditioning, have made people aware of a little more caution needed. With 9 respondents completely disagreeing and 41 disagreeing, 46% of passengers do not feel completely safe when traveling with public transport. 25% neither agree nor disagree with the statement and 24% of the respondents believe they are safe from contracting the virus during the travel.

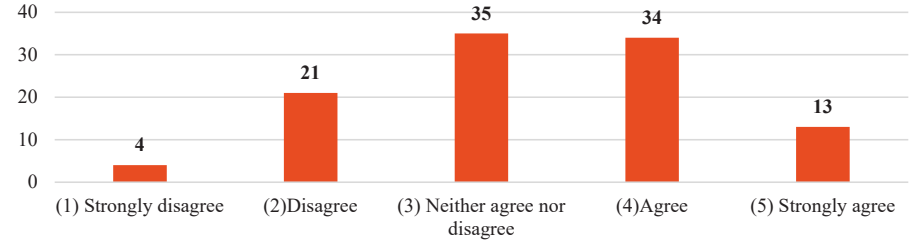
Graph 13. Passenger satisfaction with safety from contracting COVID-19 during traveling



Source: author-compiled based on collected data

When it comes to cleanliness in public transport during the pandemic, most people are indifferent according to the answers (40 of them). The fact that public transport vehicles have to be cleaned several times a day still does not satisfy a large number of respondents, so in the assessments of cleanliness more people are dissatisfied (42 of them) than satisfied (25 of them).

Graph 14. Passenger satisfaction (agreeableness) with connectivity between parts of the city during the pandemic

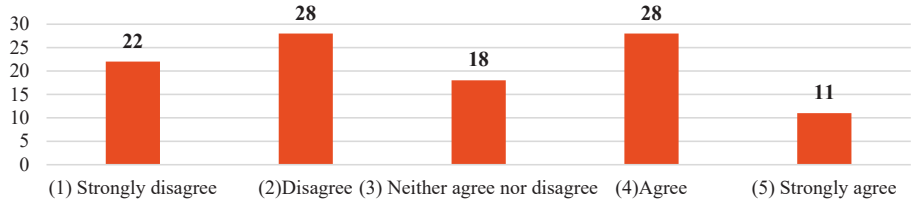


Source: author-compiled based on collected data

The statement *"Connectivity between parts of the city during the pandemic is satisfactory"* was assessed more positively. During the pandemic, there have been certain changes in routes of buses and trams in Zagreb, but nothing significant to make respondents very dissatisfied. More than 30% of people assessed this statement with "neither agree nor disagree" and also with rate 4 "agree." Even 12% of people strongly agree that connectivity between parts is satisfactory, while 19.6% do not agree that connectivity is good.

The statement *"The obligation to use a face mask during traveling makes it less likely for me to use public transport"* received the most diverse answers. The attitudes and opinions of the respondents are various and the same percentage (26%) of them agree and disagree. 17% of them neither disagree nor agree, but 20% of the passengers strongly disagree with the statement.

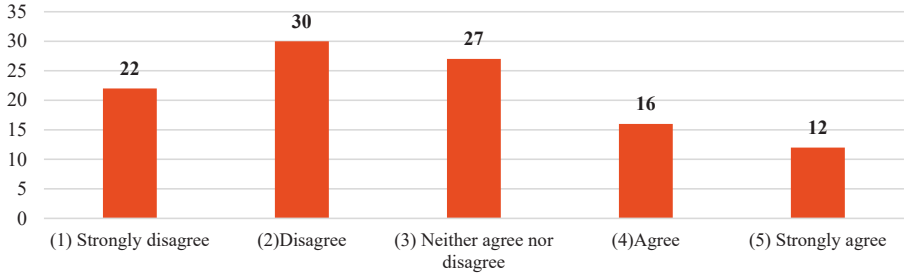
Graph 15. Motivation to enter public transport because of the obligation of using face masks in public transport



Source: author-compiled based on collected data

The conclusion is that more people are willing to wear masks when they are able, for their own safety and the safety of other people using public transport (see Graph 15).

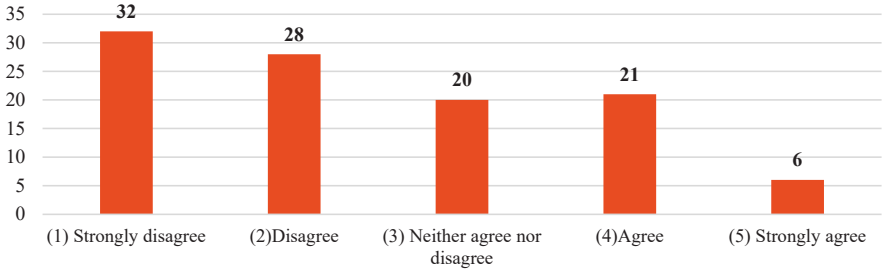
Graph 16. Motivation to enter public transport because of maintaining physical distance in public transport



Source: author-compiled based on collected data

"The obligation of keeping the physical distance during traveling makes it less likely for me to use public transport" is the statement that most respondents do not agree with it. 48% of people either strongly disagree or disagree, while 27 of them (25%) neither agree nor disagree with the statement. These data suggest that the respondents in this survey respect the measures for containing the virus and are accustomed to maintaining physical distance in other places, not only in public transport.

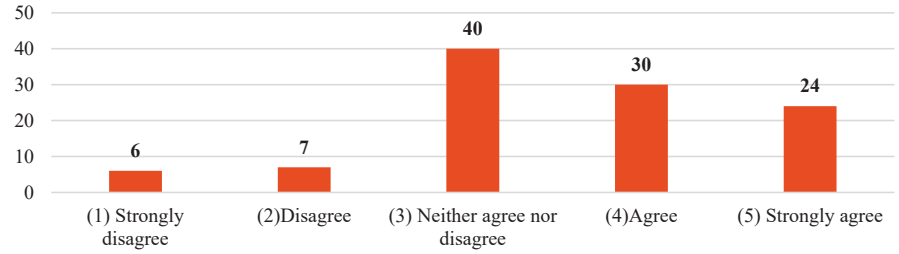
Graph 17. Motivation to enter public transport because of mandatory hand disinfection in public transport



Source: author-compiled based on collected data

"Mandatory hand disinfection before and after traveling makes it less likely for me to use public transport" is the statement to which the respondents reacted more disagreeably than agreeably. 60 passengers (56%) disagree with the fact that hand disinfection rejects them from using public transportation. It is concluded that most people are still responsible and listen to the recommendations of the Croatian Civil Protection Headquarters. It is recognized that still 25% of people either agree or strongly agree that constant hand disinfection discourages them from using public transport.

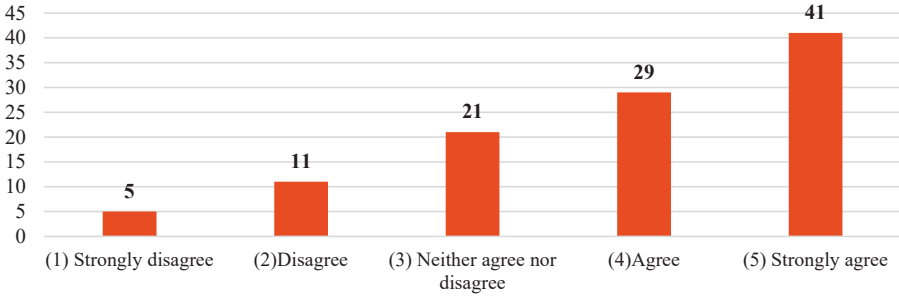
Graph 18. Usefulness of limited number of passengers in public transport



Source: author-compiled based on collected data

A limited number of passengers is one of the recommendations for using public transport during the pandemic. For their own, but also for other passengers' safety, it is recommended to avoid crowded public transport. Most of the responders neither agree nor disagree with this statement. From previous answers, it is discernible that people are still dissatisfied with crowded public transport and therefore most people responded indifferently, neither agreeing nor disagreeing, but 50% either agree or completely agree. It is concluded that the respondents are aware of the danger of a large number of people in one place and understand the risk.

Graph 19. Passengers' opinion about the use of other forms of transport after the COVID-19 crisis



Source: author-compiled based on collected data

"The COVID-19 crisis has prompted me to think about other forms of transportation (i.e. car, bicycle, electric scooter, etc.)" is the statement to which the answers were most unified. 41 respondents strongly agree about thinking of using different means of transport after this crisis. Overall, 65% of the participants agree with this statement, while 15% strongly disagree or disagree. It is concluded that the Covid-19 crisis has greatly affected people regarding buying or using modes of transportation other than public transportation. An important reason for this is the measures of the Civil Protection Headquarters, as well as the fear of the virus, and the avoidance of a large number of people in one place. From the available answers, it can be seen that most people respect and follow the prescribed protection measures against the virus, but they also discourage people from using public transportation during the pandemic. Consumers avoid public transport when they can, and other transportation options are on the rise. Except cars, people think about buying bicycles, electric scooters, scooters, and other types of transport, and this demand will only rise in near future.

3.4. Limitations and future research

The empirical research did not include all types of public transport and satisfaction with their services. Due to the complexity of the topic, it is recommended that the following research look at other Croatian cities, as well as other types of public transport, like maritime transport important for the perspective of tourism. Intercity bus transport has also not been included in this research. Moreover, the limitations of the results of empirical research conducted for the purpose of writing this thesis relate to the impossibility of generalizing the results and their use in the world or at European level, due to a small sample of the respondents (107). Another disadvantage of this research could be the smaller share of the student population (between 18 and 23 years old) and the retired population, being frequent users of public transport services.

4. CONCLUSION

Public transport is accessible to all users under same conditions. It enables the movement of people, from their place of residence to the place where they perform all life activities such as work, travel, education, shopping and leisure. Also, it enables the movement of goods from the place of production to the place of need. Many advantages of using public transport are mentioned in this paper. Firstly, it enables the transport of much larger passenger capacity, the price of using public transport is lower, environmental pollution is reduced and a higher level of safety is provided than in car transport. Some of the disadvantages are less driving comfort compared to car transport, poor conditions inside vehicles such as congestion, lack of space, and large traffic jams, especially in urban areas. One of the problems of public transport in Croatia and Zagreb is incompleteness and disconnection of different means of transport. Considering the geo-traffic position of the city of Zagreb, the existing railway network has good preconditions for the organization of integrated city transport.

In 2020, the world has been hit by a pandemic caused by the corona virus. This health crisis soon turned into an economic crisis for many sectors, most notably transport and tourism. In many cities around the world, public transport lines have almost been suspended. Informal transport providers have become one of the most vulnerable business operators, as they typically have less capacity to organize, request emergency funding, or access commercial financing. Governments all over the world have been drafting recovery measures to ensure the financial sustainability of transport companies, as the pandemic is pushing the global economy to a significant slowdown.

Organizing public transport in pandemic conditions is a challenge for all, but it is also a responsibility. In the conducted empirical research, the author highlights several main issues. The most important findings from the primary research is general dissatisfaction of people with traffic jams in public transport, long waits for the lines and crowded vehicles. Furthermore, it should be emphasized that the results of the primary research indicate numerous positive aspects of public urban transport in the city of Zagreb, including safety during public transport and compliance to the timetable.

Although the paper emphasizes that the city of Zagreb needs to integrate and connect different types of transport and enable better efficiency, consumers agree that availability of public transport during the crisis is satisfactory. It is concluded that these are the passengers who travel in the urban area of the city and are not frequent users of public transport. Also, positive feedback is given to information about public transport that has been provided during the crisis.

Furthermore, research has shown that the respondents mostly follow and believe in protection measures against spreading the virus, such as wearing face masks, disinfection of hands, maintaining social distance and these measures do not reduce motives for passengers to

use public transport. Still, because of the fear from spreading the infection and insecurity of being grouped with a large number of people in public transport, the passengers are increasingly thinking of new modes of transport during the pandemic. Consumers avoid public transport when they can, and new modes of transport are gaining on importance. The corona crisis has greatly affected public transportation, and there is no doubt that the crisis will change passengers' ways and perceptions about using public transportation further in the future.

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INFLUENCE OF COVID-19 PANDEMIC ON CHANGES IN CONSUMER BEHAVIOUR: RESEARCH FINDINGS IN CROATIA

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Abstract

Crisis caused by coronavirus (COVID-19) pandemic has shaken the consumer industry by imposing new rules and limitation and caused several changes in consumer behaviour. Effected by restrictions, consumers found themselves in situation that they are not able to fulfill their customer needs as they used to. They are forced to adapt to new circumstances, so called "new normal", adopt new habits and accept new consumer industry models. Each crisis in recent history caused changes in consumer behaviour, but, unlike the other, mostly financial crises, the COVID-19 is a global health crisis that threatens lives and affects all groups of consumers, regardless of purchasing power. Uncertainty of duration of the pandemic will lead to adjustment of industry to new priorities of consumers which will undoubtedly put their own health safety on the first place. The performed research presents the results of a survey conducted by the authors provided on a sample of respondents in Croatia. The purpose was to compile and analyse information of the impact of the COVID-19 on their consumer behaviour. It also presents a cross-section of factors influencing the consumer decision-making process. In accordance with the aim of the paper, hypothesis have been formulated by which the authors will try to prove that shopping habits will change. The consumers will more often choose domestic food of local producers and take more responsibility of their own health. These factors will become a new basis for achieving a competitive advantage for producers, but also traders, as well as society as a whole.

Key words: coronavirus pandemic, consumer behaviour, health safety, Croatia, competitive advantage

1. INTRODUCTION

Researches of consumer behaviour in its beginnings started from perspective that the consumers are rational individuals who deeply analyse their consumer decisions before the act of making the purchase (Schiffman and Kanuk, 2004). Consumer behaviour was studied as a part of marketing functions inside the companies. It took some time until the researches got out of the box and accepted the fact that consumers are not always rational and sometimes made decisions impulsively. According to Schiffman and Kanuk (2004) factors that contributed to growing interest for consumer behaviour were: accelerated development of new products, development of consumer movement, public policy, concern for the environment and opening of national markets to the world. Development and availability of technology exposes consumer of our time to wide range of information and impacts in which he must choose the best for himself. Because of his unique characteristic, today's researches try to focus on every consumer and try to understand his needs and motivations. Meeting the customer needs becomes the imperative of industries, better understanding of their needs is conditional for their survival. Buying process begins when consumer is aware that there is a difference between his real

condition and his needs. Low level of satisfaction on existing supplies, change of living or financial environment or wish for something new or different are factors that influence consumer decision when starting buying process. The aim of marketing specialists is to identify the circumstances leading to buying process.

Every once in a while, something happens that deeply affect and change consumer behaviour and lays foundations for new studies. Our century, so far, was hit by global financial crises in 2008 which caused severe recession worldwide, and now pandemic of virus COVID-19 declared by WHO in March 2020 that still lasts. The consequences of pandemic are yet to be shown, but it is already certain that it will cause significant drop of global and national GDP which will lead to new recession. From the outbreak of coronavirus and the moment when the World Health Organization declared a state of pandemic the whole world has started a new chapter which characterizes changes called „new normal". By the time this research is conducted, according to European Centre for Disease Prevention and Control (European Centre for Disease Prevention and Control, 2020), since 31 December 2019 and as of 01 September 2020**,** 25.509.135 cases of COVID-19 around the world are confirmed, including 850.902 deaths. Virus influenced not only human health and world economy but also has changed consumer habits and behaviour, once again. According to worlds analysts, Economist Intelligence Unit (EIU, 2020) predict that half of the global population will be infected and major Chinese study from the Chinese Centre for Disease Control and Prevention (Taylor, 2020), which is published last month, claim that men have a higher risk of death than women. This data shows how important is for people worldwide to change habits if they want to keep health, economic situation and work. It is also an indicator for companies on global market that, if they want to continue to exist, they must adjust their business for new challenges.

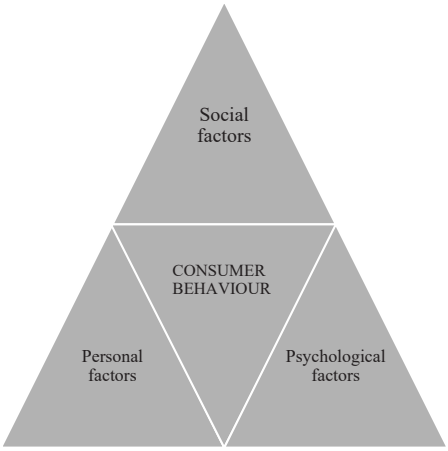
Every crisis opens new windows for consumers. In a review (Sharma and Sonwalkar, 2013) crisis served as a mini electric shock announcing a new era, maybe the era of responsible consumption. After the periods of mandatory closing of some businesses, quarantines, recommendations to stay at home and ubiquitous slogans of obligations of keeping social distance, lock-down periods are slowly relaxing, although the virus is still around. Many companies moved to work from home, and surely a certain number will consider keeping this way of doing business in the future period as well. Social distance slogans are supplemented with "stay responsible", and the consumers slowly accept this as a way of life, at least in the near future. Affected by uncertainty of what future will bring, consumers around the world develop new habits encouraged primarily by the care for their own health, but also for their material status. This exploratory study focuses on the results of online questionnaire conducted on 615 consumers in Croatia to study the effects of COVID-19 crises on their consumer habits and possible new forms of behaviour. The consumers were asked about their food consumer habits, fears related to their health safety, using of online models of purchasing, importance of epidemic conditions while attending the market. Interesting answers are obtained in answering the questions about eventual positive effects of COVID-19 on their personal life. In the following part of this article, review of some studies of the influence of COVID-19 on consumer behaviour are presented. In the third part the methodology and sample characteristics are presented. In the fourth part the results and the hypotheses have been set and interpreted, and finally the conclusion is drawn.

2. INFLUENCE OF COVID-19 PANDEMIC ON CONSUMER BEHAVIOUR

According to American Marketing Association (2020), consumer behaviour refers to the study of how customers, both individual and organizations, satisfy their needs and wants by choosing, purchasing, using and disposing of goods, ideas and services. It is important to study

consumer behaviour because it is dynamical process affected by lots of different factors. According to Kesić (1999) these factors can be divided into three groups: social, personal and psychological factors. Social factors include culture, society and social class, social groups, family, situational factors and personal influences. Personal factors are divided on motives and motivation, perception, attitude, personality, lifestyle and knowledge. Psychological factors are information processing process, learning process, process of changing attitudes and personal influence.

Figure 1. Factors that affect consumer behaviour



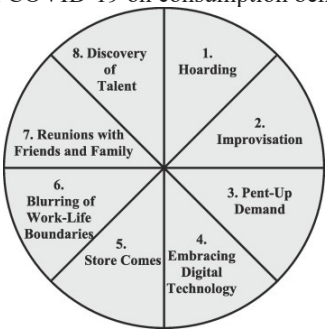
Source: authors

Lots of experts has made its contribution in these large studied field and numerous iterature was explored and used for better understanding changes in consumer behaviour (Schiffman and Kanuk, 2004; Kotler and Solomon 2002). The latest pandemic, called COVID-19, shake everything we already knew about consumer behaviour. Daily habits have been fundamentally changed by force of fear of the unknown.

COVID-19 has pulled the handbrake for the humankind race to destruction and redirected attention to life and living. (Mehta, Saxsena and Purohit, 2020). In a short time, as the pandemic gets stronger, consumer priorities are changing. In the period of lockdown, personal health and family become the most priority thing for the consumers. Emerging evidence on the impact of COVID-19 suggests that women's economic and productive lives will be affected disproportionately and differently from men - earn less, hold less secure jobs, they have less access to social protections and are the majority of single-parent households. (United Nations, 2020)

According to Shets (2020) there are eight immediate impact of COVID-19 on consumption behaviour. Impacts are presented in Figure 2.

Figure 2. Immediate impact of COVID-19 on consumption behaviour



Source: Shets J. (2020.), Impact of Covid-19 on consumer behaviour: Will the old habits return or die?, *Journal of Business Research* 117, 280-283.

There are already a few studies of impact of COVID-19 pandemic on consumer behaviour in some European countries. Stanciu et al., (2020) researched the effects of COVID-19 on the health of the population and on national economy in Romania. They focused on the problems of supply chain during COVID-19 crisis in their country. Laguna et al. (2020) studied the impact of COVID-19 lockdown on food priorities and the using of social media during lock-down on Spanish consumers. They focused their study on the sources of information that Spanish consumers searched during lock-down period concerning health, symptoms of desease and food, restaurants, delivery and some others. Di Renzo et al (2020) investigate the impact of the COVID-19 pandemic on eating habits and lifestyle changes among the Italian population using structured questionnaire packet that inquired demographic information, anthropometric data, dietary habits information and lifestyle habits information.

3. METHODOLOGY AND SAMPLE CHARACTERISTICS

For research purposes, the questionnaire was launched through google online survey forms during the first week of August and remained opened until the first week of September. A brief description in the beginning of the survey introduced people to a goal of the questionnaire which was conducted on a sample of 615 woman and men aged over 18, living in Croatia. All the participants completed the questionnaire. The survey was conducted anonymously, without personal data, but including data about gender, age, education and income level. It included 30 questions regarding comparison of shopping habits and food preferences in times of lock-down and a few weeks later compared to normal times. The participants were also asked to compare frequency of using online services for purchase during lock-down period and normal times. The aim was also to find out the level of interest for keeping or raising the share of online purchase in the "new normal" period. The Likert scale was used to compare the importance of epidemiological measures for consumers to feel safety while doing purchase in the store. Finally, the participants were asked to compare the impact of COVID-19 on their economic status and on their health and to state any positive effect of pandemic period on their personal life, if there was any. Four types of questions were used in the survey, both quantitative and qualitative questions. The quantitative questions had the form of yes/no, whereas the qualitative questions had a box where people can write in their own words. The Likert scale questions and rating scale questions were used to measure their attitude and feelings, multiple choice

questions were used to select offered options and open-ended questions were used to get the participants own answers.

Data are expressed numerically and presented graphically. Quantitative data are compared using mean and standard deviation values.

The characteristics of participants are shown in the Table 1:

Table 1. Characteristics of survey participants

Gender	**Frequency**	**%**
M	279	45%
F	336	55%
Total sample	**615**	**100%**
Age		
18 - 30 years	54	9%
31 - 40 years	180	29%
41 - 50 years	225	37%
over 50 years	159	26%
Education level		
primary education	6	1%
secondary education	126	20%
higher education	483	79%
Income level		
up to 5.000,00 kn	57	9%
5.000,00 kn to 10.000,00 kn	348	57%
over 10.000,00 kn	210	34%

Source: Authors, from survey

According to gender distribution, 55% of participants are female respondents and 45% are male. 9% are in the age of 18 to 30, 29% in the age of 31 to 40, the biggest sample is in the age between 41 and 50 (37%), and 26% of participants are over 50 years old. Higher educated respondents represent 79% of the group. 9% of participants earn up tp (or less) 5.000,00 kn, 27% of participants earn from 5.000,00 kn up to 10.000,00 kn, and 34% earn over 10.000,00 kn monthly.

4. RESULTS

4.1. Change in shopping habits

Hypothesis H1: COVID-19 pandemic circumstances affected shopping habits of Croatian consumers, the frequency of making purchase decreased and the consumers turned more to local producers of food.

The Corona pandemic has changed daily habits of consumer and it is expected that consequenses after pandemic will be permanent. According to the annual Food & Health Survey

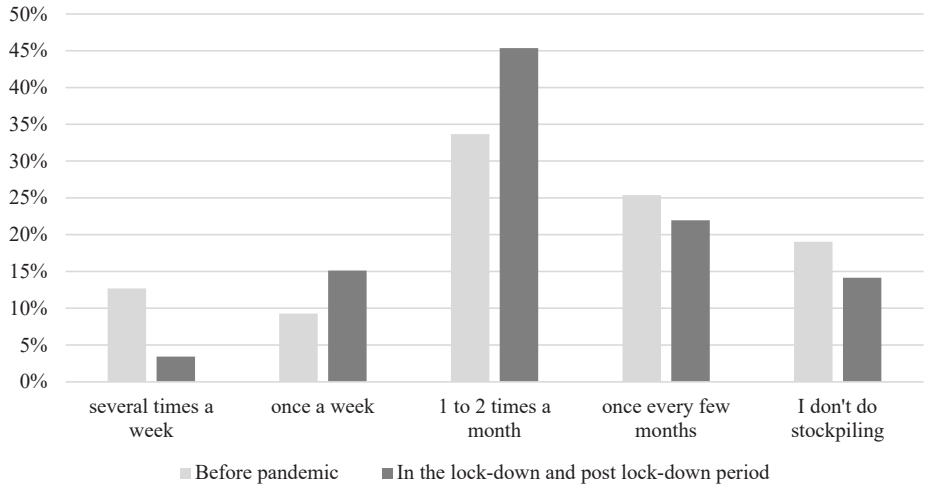
from the International Food Information Council (Poinski, 2020), four of five consumers say the coronavirus pandemic has changed their food habits, and one in five consumers reported their healthier choices. From the GlobalWebIndex research, consumers in US will buy 22% more items online often than before. Experts predict that the future consumer behaviour will be in three "A": affinity, ability and attitude (Prevedere, 2020).

To find out about changes of behaviour of consumers in Croatia, respondents were asked about the frequency of outdoor purchase in an amount over 400,00 kn with intention of creating stock in normal times and lock-down and post lock-down period.

As it is shown in the Fig.1, the frequency of making purchase with intention of making home stocks of food has changed significantly in times before pandemic, and later, in "new normal" period.

It is obvious that consumers reduced the number of outdoor purchases from several times a week to once a week, and the number of the purchases of 1 to 2 times a month has grown significantly. The percentage of consumers who doesn't do a stockpiling decreased which indicates that the habits have changed, even for those "comfortable" consumers who are accustomated to go to store for everything.

Figure 3. Frequency of outdoor purchase in an amount over 400,00 kn with intention of creating stock, in normal times and lock-down and post lock-down period



Source: Authors, from survey

As the number of active coronavirus cases in neighbouring Italy has raised, the concern and fear in Croatia was growing and the consumers started to consider stockpile. A panic buy started as a first active case on February 25 was confirmed. Some products in those days have disappeared from the shelves of stores, such as flour and yeast. Similar images could be seen through media in other parts of neighbouring countries and the rest of the world, as the virus spread globally.

When asked about choosing and buying food products from local producers rather than purchasing in the stores, even 71% responded positively. When asked about the kind of products they bought from local producers, respondents selected presented products:

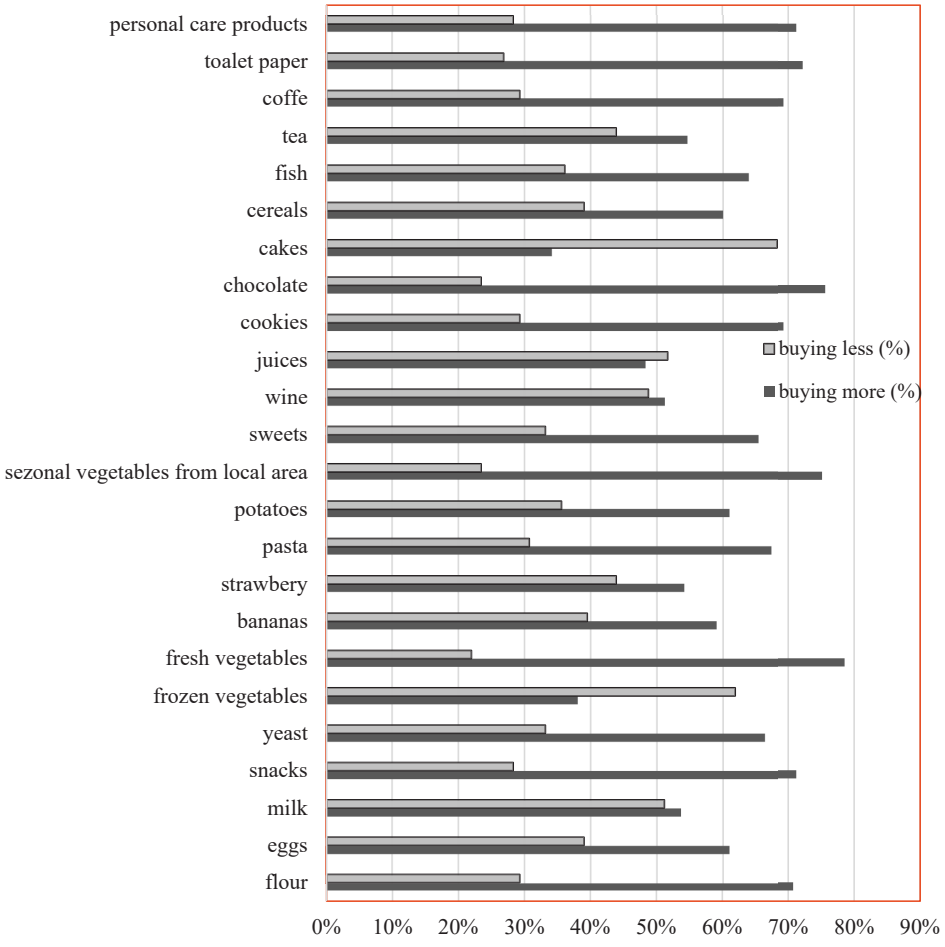
Table 2. Products bought from local producers

Products selected from local producers in period of lock-down and later
eggs
fresh fruits, mostly strawberry (seasonal)
fresh vegetables, mostly potatoes and salad
milk and cheese
meat

Source: Authors, from survey

On the question have their eating habits changed during the lock-down period, most of the respondents answered that they ate more (78%), their appetite grew and they gained weight (57%). Some products were bought more in this period, and some less. The results are presented in Figure 4.

Figure 4. Percentage overview of quantity of products purchased more or less in lock-down period compared to pre-pandemic period, results from questionnaire



Source: Authors, from survey

Respondents confirmed that they consider products from local producers of high quality from the ones from other countries and global producers. They responded that they looked for a way to buy local food products directly from the producers (78%). They were very satisfied by the platforms for procurement of this products (68%), and also with the quantity available (82%). Most respondents expressed their willingness to maintain good habits of consummation of fresh local fruits and vegetables in the future period (72%), and also their hope that the offer of this products will be adequate in availability and quality (54%).

Based on this survey results, hypothesis that the COVID-19 pandemic circumstances affected shopping habits of Croatian consumers can be confirmed. Also, in the future Croatian consumers will more often chose food products from local producers.

4.2. On-line shopping versus traditional shopping

Hypothesis H2: Online shopping will become a new normal for consumer behaviour and will have a bigger share than the classic way of shopping.

For analysis that hypotheses, participants were asked four types of questions: both quantitative and qualitative questions. The quantitative questions had the form of yes/no, whereas the qualitative questions had a box where people can write in their own words.

Table 3. Online shopping in number and percentage, before the period of lockdown

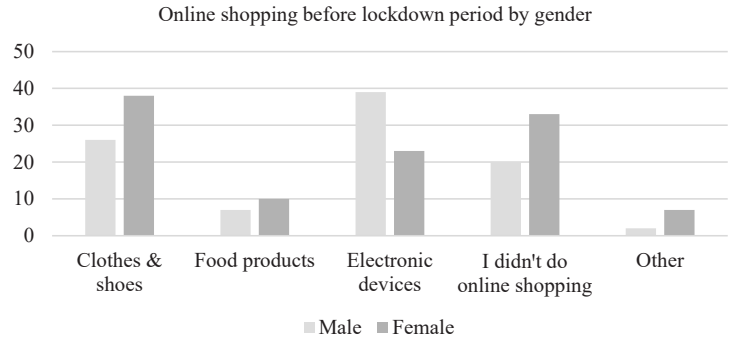
TYPE OF PRODUCT	PERCENTAGE
Clothes &shoes	31,22
Foods products	8,30
Electronic devices	30,24
I didn't do online shopping	25,85
Other	4,39
TOTAL	**100,00**

Source: Authors, from survey

Before the period of lockdown, one quarter of sample are declared that they didn't do at all online shopping. Most of respondents who used, 64% costumers, declared that they use online shopping for buying clothes and shoes.

It was confirmed that man prefered electronic devices when they buy online and woman clothes and shoes. In open-ended question costumers were asked if they were, during the lockdown period, used online shopping more than period before lockdown. If they were, they were asked to name the product.

Figure 5. Comparison of subject of shopping before lock-down period by gender



Source: Authors, from survey

Analysing open-ended question in this survey, authors get more in-depth information than from the closed question.

Table 4. Online shopping in percentage, on the period of lockdown

	PERCENTAGE
Online shoping is bigger than before	40,98
Online shoping is the same as before	59,02
TOTAL	**100,00**

Source: Authors, from survey

Two thirds of respondents, 68,78%, declared that in the future they will be going to the store rather than do shop online, no matter of the fact that the pandemic is still going on.

Table 5. Online shopping in percentage, after the period of lockdown

	PERCENTAGE
Rather online shopping than go to store	31,22
Rather go to store than shopping online	68,78
TOTAL	**100,00**

Source: Authors, from survey

Question was dichotomous with two possible answers: yes/no: In the future, would you prefer online shopping rather than go to store? At the same time, it was filter question for the question for multiplies answer. Respondents were asked to choose the reason for future online shopping. By comparing and analysing data from the survey, hypotheses H2 is reject.

4.3. Safety measures for "new normal" period

Hypothesis H3: Measures of possibility to comply with social distancing rules and respect of the measure of wearing face/nose mask consumers put on the first place to feel safe while making a purchase.

As a part of the survey, participants were asked to rate the offered safety measures by the strength of the affect on their feeling of safety while doing purchase. They had to rate nine different indicators using Likert grades from 1 – unimportant, 2 – slightly important, 3 – moderately important, 4 – important and 5 – very important. Offered indicators of safety were: possibility of hand disinfection at the store entrance, protective measures and equipment of employees, store distance from home, size of the store, hygienically packaged products, limited number of customers in the store, maintaining hygiene within the store, compliance with the measure of wearing face/nose mask in the store and possibility to comply with social distancing rules within the store. The participants were also separated in four groups concerning age: group 1 with participants from 18 to 30 years (n = 54); group 2 with participants from 31 to 40 years (n = 180), group 3 with participants from 41 to 50 years (n = 225) and group 4 with participants over 50 years (n = 159).

Table below illustrates the mean and standard deviation of the results. Mean scores of the sample confirmed that the majority of the respondents have chosen indicators 8 and 9 as their most important safety factors while making a purchase.

Table 6. Mean and Standard Deviation of the Questionnaire Indicators

Item No.	Questionnaire indicator	Mean/average	Standard deviation
1	posibility of hand disinfection at the store entrance	3,64	0,289
2	protective measures and equipment of employees	3,19	0,161
3	store distance from home	3,17	0,406
4	size of the store	3,75	0,458
5	hygienically packaged products	3,37	0,283
6	limited number of customers in the store	3,53	0,190
7	maintaining hygiene within the store	3,44	0,336
8	compliance with the measure of wearing face/nose mask in the store	3,86	0,277
9	possibility to comply with social distancing rules within the store	3,98	0,336

Source: calculations by authors, from survey

Comparing results by groups, as it is presented in Table 7, it is obvious that the indicators with the highest mean value are not the most important in all groups. The possibility to comply with social distancing rules within the store is of the highest importance for consumers in the age over 50 with mean value of 4,45. The lowest overall mean value is expressed for the indicator no. 3, store distance from home, with overall average value 3,17 and indicator 2, protective measures and equipment of employees with 3,19. The data gathered from the participants are presented in Table 7 which demonstrates the percentages of the descriptive statistics for the expressed indicators measured by a Likert scale.

Table 7. Descriptive Statistics for the Questionnaire Indicators

			Ind. 1 hand desinfection	Ind. 2 employee protective measures	Ind. 3 store distance	Ind. 4 store size	Ind. 5 hygienically packed product	Ind. 6 limited customers	Ind. 7 hygiene in the store	Ind. 8 face/nose mask	ind. 9 social distance
GROUP 1	n=54	1	0	9 (17%)	13 (24%)	0	4 (7%)	0	0	0	1 (4%)
		2	9 (17%)	11 (20%)	10 (19%)	13 (24%)	12 (22%)	9 (17%)	11 (20%)	10 (19%)	12 (22%)
		3	12 (22%)	18 (33%)	18 (33%)	18 (33%)	22 (41%)	18 (33%)	15 (28%)	12 (22%)	9 (17%)
		4	15 (28%)	7 (13%)	9 (17%)	14 (28%)	11 (20%)	12 (22%)	22 (41%)	15 (28%)	14 (28%)
		5	18 (33%)	9 (17%)	4 (7%)	9 (15%)	5 (9%)	15 (28%)	6 (11%)	17 (31%)	18 (33%)
		Mean	**3,77**	**2,93**	**2,65**	**3,35**	**3,02**	**3,61**	**3,43**	**3,72**	**3,66**
GROUP 2	n=180	1	16 (9%)	12 (7%)	26 (14%)	9 (5%)	16 (9%)	23 (13%)	28 (15%)	16 (9%)	9 (5%)
		2	28 (15%)	38 (21%)	23 (13%)	24 (13%)	38 (21%)	16 (9%)	24 (13%)	23 (13%)	24 (13%)
		3	53 (29%)	43 (24%)	59 (33%)	62 (34%)	55 (31%)	55 (31%)	43 (24%)	43 (24%)	38 (21%)
		4	55 (31%)	63 (35%)	49 (27%)	49 (27%)	42 (23%)	46 (25%)	55 (31%)	38 (21%)	57 (33%)
		5	28 (15%)	24 (13%)	23 (13%)	36 (20%)	29 (15%)	40 (22%)	30 (16%)	60 (33%)	52 (29%)
		Mean	**4,06**	**3,27**	**3,11**	**4,53**	**3,16**	**3,35**	**3,83**	**3,57**	**3,66**
GROUP 3	n=225	1	18 (8%)	24 (11%)	36 (16%)	18 (8%)	16 (6%)	21 (8%)	38 (18%)	9 (4%)	9 (4%)
		2	18 (8%)	36 (16%)	24 (11%)	36 (16%)	24 (11%)	33 (12%)	36 (16%)	18 (8%)	16 (6%)
		3	64 (28%)	72 (32%)	64 (28%)	52 (23%)	53 (23%)	59 (25%)	76 (34%)	49 (22%)	39 (19%)
		4	72 (32%)	53 (29%)	72 (32%)	53 (23%)	71 (30%)	70 (29%)	56 (25%)	76 (34%)	71 (30%)
		5	42 (18%)	40 (17%)	29 (13%)	66 (28%)	61 (27%)	42 (18%)	19 (9%)	73 (33%)	90 (40%)
		Mean	**3,40**	**3,22**	**3,15**	**3,50**	**3,61**	**3,35**	**2,92**	**3,83**	**4,14**
GROUP 4	n=159	1	9 (6%)	6 (4%)	6 (4%)	5 (3%)	3 (2%)	5 (3%)	4 (2%)	1 (0%)	1 (0%)
		2	24 (15%)	20 (13%)	20 (13%)	16 (10%)	12 (6%)	24 (15%)	18 (11%)	6 (4%)	5 (3%)
		3	48 (30%)	58 (36%)	20 (13%)	49 (30%)	32 (23%)	20 (13%)	42 (27%)	18 (11%)	15 (9%)
		4	58 (36%)	60 (38%)	69 (43%)	48 (30%)	65 (40%)	58 (36%)	67 (42%)	51 (32%)	39 (25%)
		5	20 (13%)	15 (9%)	44 (27%)	41 (26%)	47 (29%)	52 (33%)	28 (18%)	83 (52%)	99 (62%)
		Mean	**3,35**	**3,36**	**3,79**	**3,65**	**3,68**	**3,80**	**3,61**	**4,31**	**4,45**
Mean overall			**3,64**	**3,19**	**3,17**	**3,75**	**3,37**	**3,53**	**3,44**	**3,86**	**3,98**

Source: calculations by authors, from survey

The analysis of the questionnaire leads to the fact that the measures of social distancing and wearing face/nose mask are of highest importance for consumers while making a purchase in "new normal" circumstances.

4.4. How COVID-19 has affected the sale of sports equipment

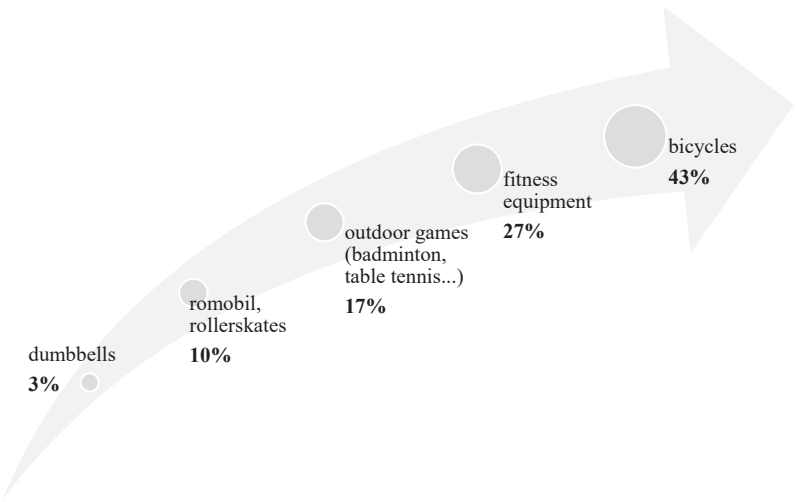
At the period of lockdown, medical advice was to do exercise every day as much as possible because it was important for physical and mental health. The fact that people were forced to work from home, had the effect of reducing movement. Sport centers were closed, so in that moment an important role had different kind of digital platforms. Because of fear of pandemic and to avoid public transport, many people are turning to bicycles.

In March, nationwide sales of bicycles, equipment and repair services nearly doubled compared with the same period last year, according to the N.P.D. Group (New York Times, 2020.), a market research company. Sales of commuter and fitness bikes in the same month increased 66 percent, leisure bikes jumped 121 percent, children's bikes went up 59 percent and electric bikes rose 85 percent.

The French government, for instance, is providing €50 for people to fix their bikes in an effort to promote cycling over public transportation (Euronews, 2020).

Table below illustrates results of survey of sale sports equipment in Croatia.

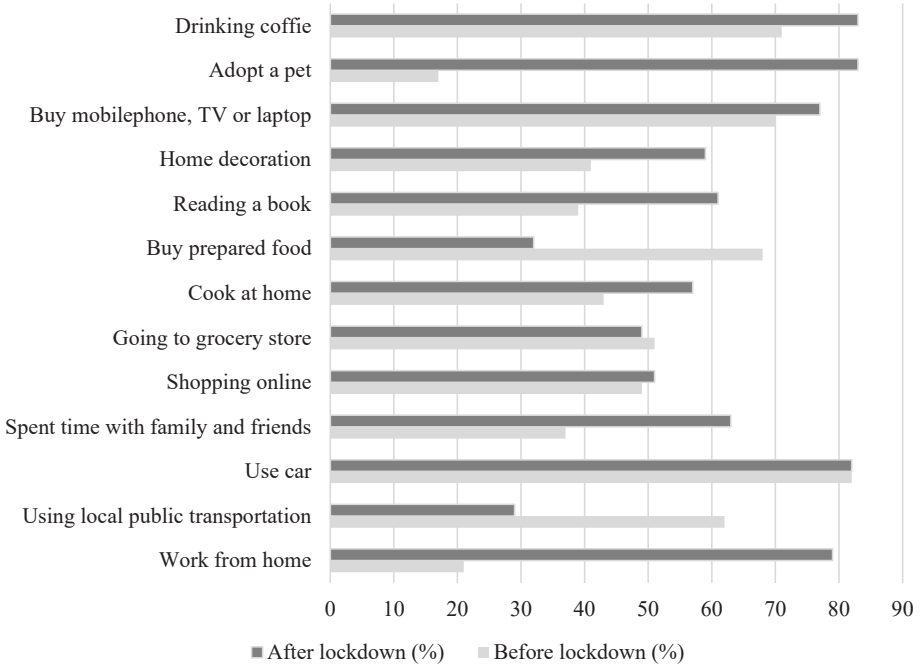
Figure 6. The sale of sports equipment in Croatia



Source: Authors, from survey

Bicycle boom happened because bicycle is one of the most basic forms of mobility and people's wish to exercise after staying at home (43% start using them). The lockdown period has created also a huge demand for home fitness equipment (27%).

Figure 7. Consumer habits before and after period of lockdown by percentage, results from questionnaire



Source: Authors, from survey

Respondents were asked to compare their habits before and after the period of lockdown. The habit that has changed the most is work from home. It has never been possible in Croatia, before the lockdown started, for so many people to work from home. Everything that could be automated, in a very short time was automated. Almost 80% people are still working from home, more women (63%) than men. Work from home brings lots of benefit and it is expected that this trend will continue in the future.

Because of the fear of pandemic and taking care about health, it is not suprising that public transportation is less used. In these uncertain times, people become aware of the importance of family and friends, healthy meal become more important than before.

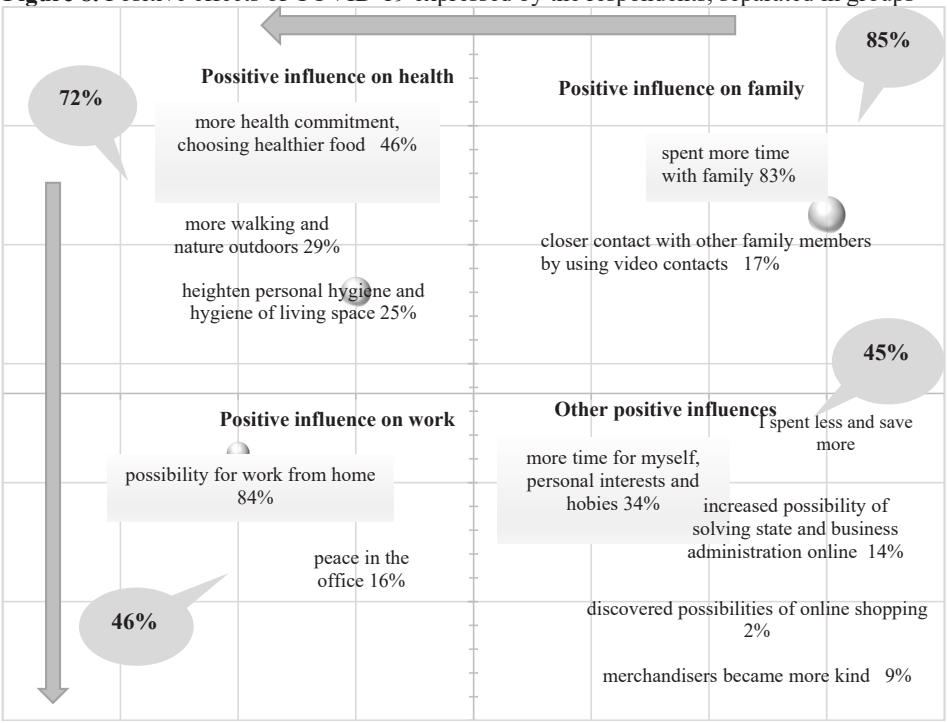
In this survey, it is an interesting fact that people their own vulnerability and sensibility show in the way of writing a poem or adopt some kind of pet (more than two thirds of respondents say that they do that – most are women, over 60%).

4.5. Positive effects of COVID-19 – is there any?

Nelson (2020) in his work on positive effects of COVID-19 say the pandemic is also providing a unique window through which to view some positive health effects from major changes in human behaviour. In open-ended last question in the questionnaire 82% of respondents in this survey named at least one positive effect of COVID-19 on their personal life.

These positive effects can be separated in four main groups according to the subject of influence. Most of the respondents expressed the positive effects of COVID-19 on their family (85%), health (72%) and work (46%). Other respondents expressed varoius positive influences, divided in separate group (45%). Results are presented in the following figure.

Figure 8. Positive effects of COVID-19 expressed by the respondents, separated in groups



Source: Authors, from survey

5. CONCLUSION

The pandemic of COVID-19 has changed not only entire economy, stability of global market, but also left permanent change on consumer behaviour. Consumers have adjusted to COVID-19 with new shopping habits and higher use of digital services.

The results of the survey presented showed that Croatian consumers decrease the frequency of going to stores and increase stockpiling, but will not rise the share of online shopping in the future. They increased caution while doing purchase, and consider measures of social distancing and wearing face mask very important. Positive effects such as choosing healthier food or increasing sport activities should be retained, and opportunity to spend more time with family they consider as a valuable positive effect of lock-down period.

There is an expectation that some habits will be the same as before period of lockdown but it is evidently that we are witnesses of "new normal" life with new characteristics of consumer behaviour. Despite being separated, for many people lockdown period has become a time for own re-examination, for family and friends, play sports and get back to things that they value. In the meantime, this phenomenon become the subject for lots of researches. Period after

lockdown is this moment where we are right now, it is not yet completed and opens up the opportunities for further researches.

6. LITERATURE

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