ASSESSING THE EFFECTIVENESS OF TOOLS TO BUILD RESILIENCE TO GLOBAL CRISES IN THE SMEs SECTOR

Kristián FURIAK[1]

Abstrakt: *Jedným zo základných kameňov spoločnosti je fenomén podnikania, o ktorom sa dá povedať, že predstavuje hnací motor ekonomík prevažnej väčšiny štátov. V globálnom kontexte sa však podnikateľské aktivity čoraz častejšie realizujú v prostredí, ktoré je z pravidla značne nestabilné a mimoriadne variabilné. Práve v takomto prostredí rastie význam všetkých faktorov, ktoré majú potenciál vplývať na samotné podnikateľské subjekty, ktoré v ňom pôsobia. Jedným z týchto faktorov sú krízy a nežiadúce udalosti globálneho charakteru, ktoré so sebou prinášajú dopady na všetky aspekty spoločenského života. Príkladom takejto krízy bola pandémia COVID-19, ktorá významným spôsobom ovplyvnila aj podnikateľské prostredie a aktivity podnikateľských subjektov. S ohľadom na skúsenosti z tohto obdobia je teda žiadúce hľadať spôsoby minimalizovania dopadov globálnych kríz na podnikateľské subjekty. Cieľom tohto príspevku je zamerať sa na skúmanie efektívnosti aplikácie systémov krízového manažmentu, manažmentu rizík a manažmentu kontinuity podnikania na sektor malých a stredných podnikov v kontexte pôsobenia globálnej krízy a posúdiť ich vplyv na odolnosť a pripravenosť podnikov.*

Kľúčové slová: MSP, manažment rizík, podnikateľské prostredie, udržateľnosť, odolnosť

Abstract: *One of the cornerstones of society is the phenomenon of entrepreneurship, which can be said to drive the economies of the vast majority of countries. In the global context, however, entrepreneurial activities are increasingly taking place in an environment that is, as a rule, highly unstable and extremely variable. It is in such an environment that all the factors that have the potential to influence the very businesses that operate in it are becoming increasingly important. One of these factors is crises and adverse events of a global nature, which have an impact on all aspects of social life. An example of such a crisis was the COVID-19 pandemic, which also significantly affected the business environment and the activities of business operators. In view of the experience of this period, it is therefore desirable to seek ways of minimising the impact of global crises on business entities. The aim of this paper is to examine the effectiveness of applying systems of crisis management, risk management and business continuity management to the SME sector in the context of the impact of the global crisis and to assess their impact on the resilience and preparedness of enterprises.*

Keywords: SMEs, risk management, business environment, sustainability, resilience

1. INTRODUCTION

The business environment represents the totality of factors, entities and relationships between them, whose specific action determines how businesses will behave and what challenges they will face in the implementation of their business activities. This environment also determines to a large extent the extent to which enterprises will perform, which directly affects the performance of the national economy [1, 2]. Within the Slovak Republic, it can be stated that the most significant part of the business entities operating here is made up of the category of small and medium-sized enterprises. According to the statistics of 2021, the sector of small and medium-sized enterprises has up to 99.9% share of the total number of enterprises operating in Slovakia. In terms of employment, small and medium-sized enterprises create more than 74% of occupied jobs, while in terms of creating added value within their business activities, they account for 55% of the total added value produced by enterprises in Slovakia [1]. The importance of small and medium-sized enterprises grows with the realisation that these entities have an irreplaceable place in the supply chains for large enterprises, thus

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[1] Ing., Faculty of security management, University of Žilina, 1. mája 32, 010 26 Žilina, Slovakia, e-mail: kristian.furiak@uniza.sk

indirectly influencing the remaining 26% of occupied jobs and 45% of the total value added produced. It is therefore clear from the above that it is small and medium-sized enterprises that form one of the most important components of the national economy, and it is therefore in the enormous interest of society as a whole for these entities to operate in the most favourable environment possible.

In examining the impact of global crises on the SME sector, the COVID-19 pandemic provides an example of such an event. This crisis has been one of the most significant factors affecting the SME sector in recent times. The COVID-19 pandemic has fundamentally destabilised the business environment not only in Slovakia, but also globally. The impact of the pandemic on SMEs and on the business environment in general was of a different nature. It was caused not only by objective factors such as the business sector, the size of the enterprise or the use of specific tools, but also by indirect effects of the pandemic, such as the consequences of government measures and the restriction of the activities of the enterprises themselves [3, 4]. In view of the above, it is therefore more than desirable to examine in detail how the pandemic has affected the SME sector in particular and, with it, other aspects of the economy and social life in general. Using the COVID-19 pandemic as an example, it is also possible to examine the effectiveness of tools and measures, such as crisis management, risk management and business continuity management processes, which are designed to help businesses cope with the adverse effects of various crises. It is by examining these issues that it is possible to determine how effective these tools are in practice, what their shortcomings are, and how they could be used in the future to increase the preparedness and resilience of SMEs in the event of future crises [3, 2, 5, 6].

One of the options that have the potential to ensure the resilience and sustainability of business continuity sustainability factors is the implementation of crisis management and business continuity management (BCM) elements into the enterprise to improve the management system [7]. It is the BCM system that is the key management discipline that through the framework can establish measures to ensure the long-term resilience of the business. Its introduction into the management framework of an enterprise leads to an improvement in the performance of the enterprise while creating a systematic approach in organizing its resources and inventories. The resources and stocks thus established can then be effectively managed and used in the event of a crisis in a way that contributes to the rapid stabilisation of the enterprise. Another element that plays an important role during global crises is the crisis management and risk management system. These systems are already quite well established in practice just for the purpose of addressing the issue of ensuring enterprise resilience [8, 9, 10, 11]. Crisis management, risk management and BCM are considered to be important tools for increasing the resilience and protection of society and enterprises from all kinds of crisis phenomena, as well as from human failure [12].

As the inherent instability of the business environment grows with advancing globalisation and the likelihood of crises with global impact increases, so does the importance and need to create effective tools that can ensure that businesses can survive such situations and develop sustainably. In this context, it is therefore crucial to be able to properly understand past crises and learn from them to better face future crises in practice. To this end, the research and statistical evidence that form the basis of this study was undertaken.

2. METHODOLOGY

The aim of the study was to investigate the benefits of applying crisis management, risk management and business continuity management (KM, MR, BCM) for small and medium-sized enterprises in situations of global crisis or adverse events. In this study, the crisis was represented by a pandemic and related changes in the business environment. Based on the data collected from the questionnaire in the nationwide survey, its impact on the operations of SMEs was analysed. The purpose of the survey was to collect the data needed to carry out this analysis, focusing on SMEs based in Slovakia.

Representativeness of the statistical sample

Sample size is defined as the number of statistical units that are actually included in the survey and represents the statistical population of all statistical units from a given population in which the selected statistical characteristics are examined. To assess the representativeness of the sample, a relationship based on the level of error, the probability distribution of the responses and the number of standardised deviations can be used, which is described by Titko in the following form [13, 14]:

$$n = \frac{\dfrac{z^2 \times p(1-p)}{e^2}}{1 + \dfrac{z^2 \times p(1-p)}{e^2 N}}$$

Exploring the existence of dependence

Investigating the existence of a relationship focuses on identifying the presence of a relationship between variables and its statistical significance. For this purpose, the Pearson chi-square test of independence is used, which compares the observed frequency with the expected frequency. When using this method, it is important to observe the Cochran's rule, which is a necessary condition for performing this test. In this study, the significance level was set at $p < 0.05$. Pearson's Chi-square test of independence was applied to both hypotheses under study to determine the statistically significant relationship between the variables. The following formula was used in applying the Chi-square test for independence of variables according to this methodology [15, 16]:

$$\chi2 = \sum_{i=1}^{R} \sum_{j=1}^{C} \frac{\left(n_{ij} - E_{ij}\right)^2}{E_{ij}}$$

Exploring the power of dependence

Hypothesis testing involves examining the strength of the relationship between variables, assuming that a statistically significant relationship has already been established between them. For this purpose, Cramer's V and Pearson's contingency coefficient are used. Both of these coefficients have been applied in testing both hypotheses in order to determine the strength of the contingency [15, 13, 14, 17].

Pearson's contingency coefficient was used to assess the strength of the contingency relationship between variables based on the qualitative features specified in the predefined hypotheses. This coefficient can take values ranging from 0 to 1, and their interpretation is as follows [18]:

- A value of 0 indicates complete independence between the traits under study.

- A value of 1 indicates complete dependence between the traits under study.

The other values in this range express different strengths of contingent dependence between the qualitative variables under study. The calculation of this coefficient is possible using the formula given as follows [14]:

$$C = \sqrt{\frac{\chi2}{\chi2 + n}}$$

Cramer's contingency coefficient V is used to determine the appropriate degree of contingency between two qualitative statistical features based on the formulated hypothesis. Its values range from 0 to 1 and are interpreted as follows [18]:

- A value of 0 indicates that there is no relationship between the statistical features.

- A value of 1 indicates that there is a perfect relationship between the statistical features.

The other values in this interval express varying degrees of the existence of a relationship between the qualitative statistical traits under study. To calculate Cramer's contingency coefficient V, the formula can be used, which is given as follows [14]:

$$V = \sqrt{\frac{\chi^2/n}{\min(R,C) - 1}}$$

3. RESULTS

In order to meet the research objectives, hypotheses and research questions were formulated and tested through the application of statistical methods on data from the source statistical dataset. The statistical set represents 597 171 small and medium-sized enterprises operating in the Slovak Republic at the time of the survey [17]. The questionnaire was distributed to randomly selected SMEs in the number of 1,145 entities. The return rate of the questionnaires was at the level of 359 pieces, which represents 31.35%. An overview of the basic information about the survey is presented in Table 1.1.

Table 1 Background information on the implementation of the survey

Size of the statistical population	597 171 enterprises
Original statistical sample size	1 145 enterprises
Reduced statistical sample size	359 enterprises

The minimum size of a representative sample with respect to the 95% confidence interval, with the estimation error set at 5.5% and with the proportion of the observed trait at 0.5, is 317 statistical units. **A statistical sample of 359 enterprises is considered representative.**

Hypothesis H1

The hypothesis is that there is a statistically significant relationship between integrating elements of crisis management, risk management and business continuity management (CM, RM, BCM) and the crisis preparedness of enterprises. The hypothesis predicts that enterprises that integrate these elements of CM, RM and BCM will be better prepared to manage crises and adverse events. The hypothesis will be tested by using the data collected by asking to what extent enterprises have integrated CM, RM, and BCM systems and to what extent they were prepared for the COVID-19 pandemic. From the data collected, a contingency table was constructed and the statistical methods described in the previous section were applied (Table 2).

Table 2 Contingency table for hypothesis H1

Were you prepared to deal with the COVID-19 pandemic (1 - definitely yes, 5 - not at all)?							
		Yes (1)	**Rather yes (2)**	**Do not know (3)**	**Rather no (4)**	**No (5)**	
Within your enterprise, you have embedded the following in your management: (you can tick more than one option):	**They have integrated all**	4	1	2	0	0	7
	Have at least one integrated	28	58	82	51	54	273
	Have none integrated	8	12	23	22	14	79
		40	**71**	**107**	**73**	**68**	**359**

Pearson Chi-Quadrat	**χ2 = 20,2986**
Critical value Chi-Quadrat	**15,5073**
Value ρ	**ρ = 9,264E-03**
Cramer's contingency coefficient	**V = 0,1189**
Pearson's contingency coefficient	**C = 0,2313**

Based on the analysis, it can be confirmed that there is a statistically significant relationship between the variables. Based on the calculation of the degree of association, a weak dependence was found. The results show that enterprises that have integrated all three management systems have demonstrated the highest level of preparedness for a pandemic crisis. Conversely, enterprises with low or no integration of these management systems showed a high level of unpreparedness for the crisis. These findings are shown in Figure 1 and Figure 2.
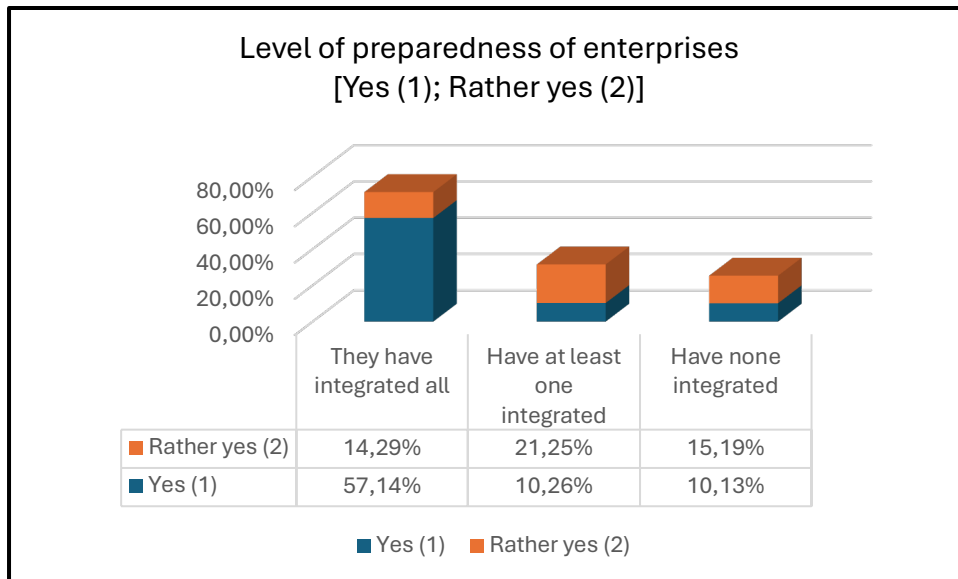

Figure 1 Level of preparedness of enterprises with different levels of integration of CM, RM, BCM systems
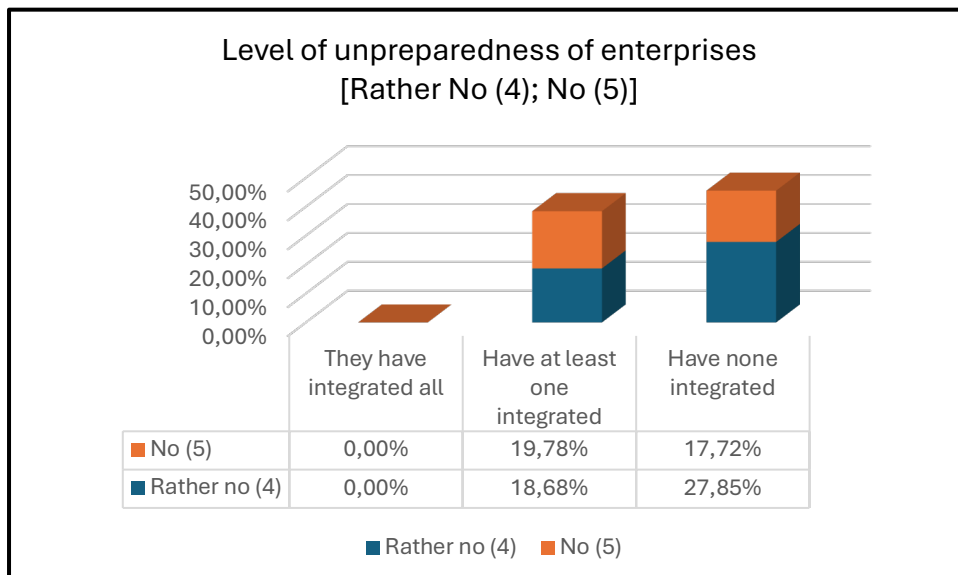

Figure 2 Level of unpreparedness of enterprises with different levels of integration of CM, RM, BCM systems

Hypothesis H2

Hypothesis H2 assumes the existence of a statistically significant relationship between the level of enterprise preparedness and the level of negative impact of a crisis event. Better prepared enterprises should exhibit lower rates of negative pandemic impacts. To confirm or refute this hypothesis, data

obtained by querying the degree of enterprise preparedness and the degree of negative impact of a crisis event (COVID-9 pandemic) will be used. From the data collected, a contingency table was constructed and the statistical methods described in the previous section were applied (Table 2).

Table 3 Contingency table for hypothesis H2

		Has the situation related to the COVID-19 pandemic affected your business (1 - definitely yes, 5 - not at all)?					
		Yes they hit us (1)	Rather they hit us (2)	Do not know (3)	Rather they didn't hit us (4)	No they didn't hit us (5)	
Were you prepared to deal with the COVID-19 pandemic (1 - definitely yes, 5 - not at all)?	Definitely ready (1)	10	8	8	7	7	40
	Rather ready (2)	18	17	18	11	7	71
	Do not know (3)	25	18	31	22	11	107
	Rather not ready (4)	36	14	10	8	5	73
	Definitely not ready (5)	30	15	10	8	5	68
		119	72	77	56	35	359

Pearson Chi-Quadrat	$\chi2 = 28,4844$
Critical value Chi-Quadrat	26,2962
Value ρ	$\rho = 2,765E-02$
Cramer's contingency coefficient	V = 0,1408
Pearson's contingency coefficient	C = 0,2711

Based on the calculations, it can be concluded that there is a statistically significant relationship between the variables, and based on the calculation of the association rate, we conclude that the dependence is weak. From the results, it is clear that the vast majority of enterprises that showed a high level of preparedness experienced fewer negative impacts of the crisis on their operations. In contrast, enterprises with lower levels of preparedness reported higher levels of negative impacts of the pandemic on their operations. These results are shown in Table 4, Figure 3 and Figure 4.

Table 4 Percentage distribution for hypothesis H2

|		*Has the situation related to the COVID-19 pandemic affected your business (1 - definitely yes, 5 - not at all)?*				
		Yes they hit us (1)	Rather they hit us (2)	Do not know (3)	Rather they didn't hit us (4)	No they didn't hit us (5)
Were you prepared to deal with the COVID-19 pandemic (1 - definitely yes, 5 - not at all)?	Definitely ready (1)	25,00%	20,00%	20,00%	17,50%	17,50%
	Rather ready (2)	25,35%	23,94%	25,35%	15,49%	9,86%
	Do not know (3)	23,36%	16,82%	28,97%	20,56%	10,28%
	Rather not ready (4)	49,32%	19,18%	13,70%	10,96%	6,85%
	Definitely not ready (5)	44,12%	22,06%	14,71%	11,76%	7,35%
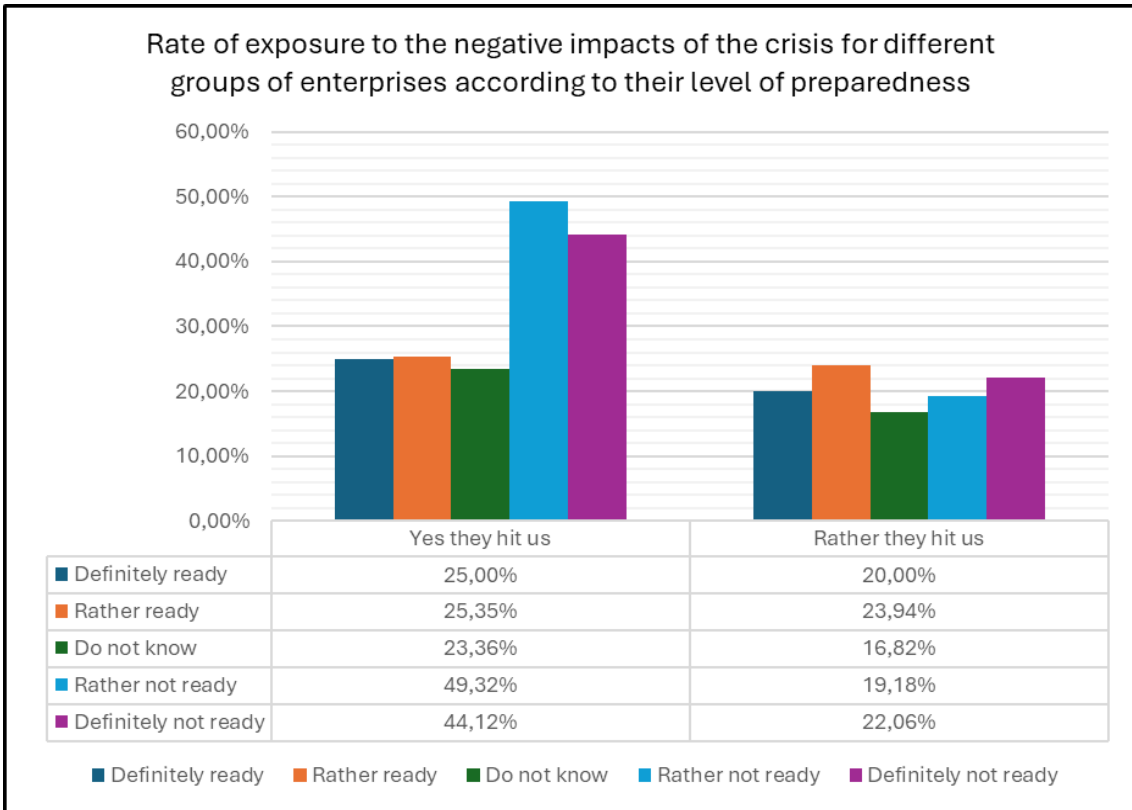
Figure 3 Rate of exposure to the negative impacts of the crisis for different groups of enterprises according to their level of preparedness
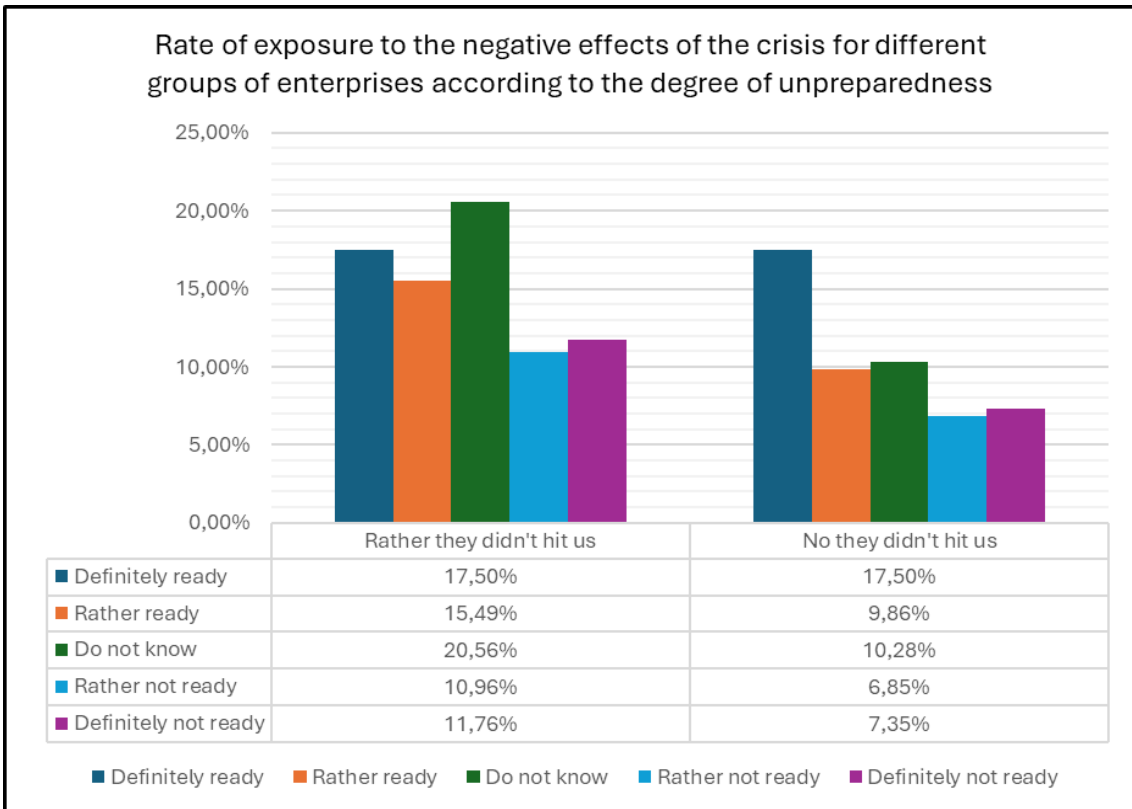

Figure 4 Rate of exposure to the negative effects of the crisis for different groups of enterprises according to the degree of unpreparedness

4. DISCUSION

Within the framework of verification and examination of hypothesis H1, the existence of a statistically significant relationship with low intensity between the integration of KM, MR, FEM systems in the company and its crisis preparedness was confirmed. Further, it was proved that enterprises with a higher degree of integration of the aforementioned management systems showed a higher level of crisis preparedness. 71.43% of enterprises with integration of all three management systems reported crisis preparedness, while enterprises without integration of these systems were prepared only in 25.32% of cases. Crisis unpreparedness was reported by 54.57% of enterprises without integrated CM, RM and BCM systems. When examining and verifying hypothesis H2, the existence of a statistically significant relationship with low intensity between the company's preparedness for the crisis and the mitigation of the negative impact of the crisis on the company's functioning was confirmed. Specifically, it was shown that enterprises with higher levels of pandemic preparedness also showed significantly lower levels of negative impacts of the pandemic on their operations and business activities. This confirmed the practical effectiveness of prevention and preparation using CM, RM and BCM management systems, which were able to mitigate and minimize the negative impacts of this crisis on the business activities of SMEs during the pandemic. Intervention with the negative impacts of the pandemic was indicated for 50.35% of the enterprises that reported that they were prepared for the pandemic. In the case of enterprises that were not prepared for the pandemic, being hit by its negative impacts was reported in 93.44% of cases.

Based on these results, it was clearly confirmed that the integration of CM, RM and BCM systems in SMEs has a significant impact on their level of preparedness for crises and adverse events. In this context, the high importance of these management systems in the SME sector in building resilience and sustainability of enterprises can be noted. Nevertheless, it is necessary to take note of the specific aspects of the different types of crises, which also have a non-negligible impact on their mechanism of action and thus on their impact on the different business sectors.

5. CONCLUSION

The results of the study show that the integration of crisis management, risk management and business continuity management systems is crucial for SMEs. These systems play an important role in the ability of these enterprises to cope with long-term global crises that significantly affect the business environment. Although these systems do not provide direct protection against global crises, they make an important contribution to the preparedness of enterprises and their ability to respond effectively to crises and minimise negative impacts on their business activities. Although the pandemic that served as an example of a global crisis presented specific challenges, the importance of crisis management, risk management and business continuity management systems was confirmed. Businesses that had these systems in place demonstrated a greater ability to cope with crises and adverse events. It is therefore crucial to focus on increasing their resilience to global crisis situations and minimising the negative consequences. The COVID-19 pandemic has brought new challenges that were previously unknown on this scale, but the correct implementation of these systems has greatly helped to increase the preparedness of businesses for this situation. This global crisis has brought us many new insights into the impact of globalisation on the business environment, and it is therefore important to continue researching and finding ways to develop small and medium-sized enterprises more effectively.

Author Contributions
Ing. Kristián FURIAK (ORCID ID: https://orcid.org/0000-0002-2533-3659) is an internal Ph.D. student at the Department of Crisis Management, Faculty of Security Engineering, UNIZA. His main focus is crisis management and risk management in the business environment, while his dissertation research deals with an early warning system for risk monitoring in sports organizations.

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