IMPACT OF CRISIS SITUATIONS ON DEVELOPMENT OF BUSINESS CONTINUITY MANAGEMENT IN CROATIA

Davor Filipović[*]

Mate Krišto[**]

Najla Podrug[***]

Abstract

The study focused on the influences of different crises situations on development of business continuity management. Empirical study was conducted in Croatian companies via quantitative research. Hypothesized model for development of business continuity management was tested. Crisis situation was measured as a composite variable based on three elements: recovery time period, impact on corporate profits and amount of operations affected by the crisis. Correlation between crisis situations and development of business continuity management indicated that the increase of the risk of a crisis situation will increase the degree of development of business continuity management. Furthermore, strategic and operational risks influence more on development of business continuity management than natural disasters. Also, unintended risks influence the business continuity management development more than intentional risks. The second part of the research focused on the influence of likelihood of recurrence of the crisis situation on the development of business continuity management. The relationship between likelihood of crises recurrence and business continuity management development was not determined. The main contribution of the research lies in modelling business continuity management development related to different crises situations and likelihood of crises recurrence.

Keywords: *crisis situations, business continuity management, likelihood of crisis situations recurrence, Croatia*

1. INTRODUCTION

Nowadays, we live in a turbulent age characterized by cyclic manifestations of crises (Kindleberger and Aliber, 2005), repeated natural disasters (Cheval, 2012), rapidly changing business trends (Bhragva, 2012) and manufacturing highly dependent on IT infrastructure which, in case of failure, may lead to a slowdown in key business operations (Gupta et al., 2010). In addition to crisis situations, fast changes in business environment and within corporations are forcing management to think *ex ante* about potential risks that may cause inferior business performance. In order to ensure business

---

[*] Dacor Filipović, PhD, Assistant Professor, Faculty of Economics and Business, University of Zagreb, e-mail: dfilipovic@efzg.hr

[**] Mate Krišto, PhD, Director, Key Project, plc, Zagreb, e-mail: matekristo13@yahoo.com

[***] Najla Podrug, Associate Professor, Faculty of Economics and Business, University of Zagreb, J.F. Kennedy 6, 10000 Zagreb, Croatia, Phone: ++385 1 2383 339, Fax: ++385 1 2385 633, e-mail: npodrug@efzg.hr

continuity of a corporation, the business continuity management discipline is developed. The primary goal of business continuity management discipline is to prepare different reaction plans by which the corporations may protect themselves from both internal and external risks. Probably the oldest recognized continuity plan is described in the Bible (Book of Genesis) when Noah built Ark for himself, his wife, his sons and their wives, and for many animal species. The task for the survivors of the Ark was to continue the life on earth. Noah's Ark itself is an example of a plan used to mitigate the effects of disaster (flood) and to guarantee continuity.

Managing business continuity management is the act of predicting adverse situations which will distress critical functions and processes in the organization and ensure that the reaction to any adverse situation is planned and well-rehearsed. Managing business continuity is not just about recovering from disasters such as fire, flood or information system failure, but also about problems regarding crucial suppliers or customers, frauds, unethical operations and organizational reputation (Gallagher, 2003). Business management activities deliver framework for the decision-making and actions in order to avoid, confront and recover from a disruptive crisis consistent with strategic intent (Shaw and Harrald, 2004). Business continuity strategy characteristics are high-value and high-maintenance. Business continuity includes different technologies, from older to newer, from physical to computerised, from singular to cohesive ones (Maitra, Shanker and Mudholkar, 2013).

The goals of business continuity management include contingency planning, crisis management and recovery (Blyth, 2009). The willingness of companies to respond to unsystematic and crisis situations depends on the management involvement in business continuity planning. Business continuity planning refers to the identification and protection of critical business processes and compulsory resources in order to maintain the anticipated level of performance by preparing processes that enable the survival in times of business disturbances (Sui, Junying and Stephen, 2010). Business continuity planning lifecycle is an iterative continuous process that involves business risk and impact analysis, preparation of required emergency procedures, testing and auditing recovery procedures, staff training and awareness of recovery procedures, as well as maintenance of the business continuity plan (Savage, 2002). The purpose of the business continuity planning is to keep an organization running. This is achieved by creating a plan that addresses the recovery of key business functions in case of an incident or a disaster. Thus, business security plan allows a corporation to resume operations as soon as possible, without further consequences. The business security planning process includes risk identification, risk assessment, risk ranking and risk management (Gilbert and Gips, 2000).

Herbane, Elliott and Swartz's (2004) proposal for business continuity management to be considered as a strategic process is that it offers organisations an approach to improving the continuity of operations in the event of a crisis or disaster. Business continuity management represents crucial basis for generating value and achieving competitive advantage. Moreover, achieving and retaining competitive advantages, in context of various internal weaknesses and numerous external threats, emphasize the significance of long-term perspective in strategic management process (Herbane, Elliott and Swartz, 2004). Therefore, development of business continuity management is becoming a crucial variable, without which the

survival of the corporation in turbulent times is inconceivable. Unfortunately, business continuity management, as an academic discipline and an occupation, is still on the operational level in organizations and not on the strategic level. Wong (2009) stresses the role of business continuity management in strategic management and the strategic skills of business continuity managers. Furthermore, Wong discusses the importance of business continuity planning in the long-term planning of organisational success and the preservation of future competitiveness. Radović and Domazet (2016) stressed the importance of raising awareness about the necessity to increase the resistance of economic entities in the event of emergency. For that very reason, this research explores development of business continuity management in Croatia as well as relationship between the degree of business continuity management development and external and internal crises that jeopardize corporations. External crisis situations include natural disasters with strategic and operational risks, while the internal crisis situations are observed through intentional or unintentional crises. Additionally, this study tests the relationship between likelihood of crises situations recurrence and development of business continuity management.

2. LITERATURE REVIEW

The global business community is well aware of possible consequences of business interruption which could have a strong impact on the global and national economy, especially during the current second wave of the global economic crises. The most influential international organizations and national governments advise businesses to develop and specific capabilities in order to detect, prepare and respond to crises situations. Recent history has shown that no

organization is immune to risks which exist in its surroundings, neither to the risks which are generated in organization itself (Radović, Mitić and Raspopović, 2013).

In the context of business continuity management, there are numerous synonyms for the term *crisis* used in the economic literature, such as disasters, business interruptions, urgent and unplanned situations (Herbane, 2010). Through various concepts, crisis theory has evolved within many different disciplines. The development of crisis theory in corporations and organizations came from their own confrontation with crisis situations (Turner, 1976; Weick and Sutcliffe, 2003). Elliott (2009) presented a comparison of financial and social consequences in cases when the corporation learned from its own confrontation with the crisis and when the corporation was informed about the crisis situation. The evolution of the crisis theory can be observed from the perspective of crisis triggers. From socio-technical perspective, Pauchant and Mitroff (1990) showed two related phenomena that threaten the effectiveness of continuity plans: the first phenomenon are "vicious circles" which are the result of irresponsible decisions and accidental human intervention in complex systems and the second phenomenon are socio-technical systems. Reason (1997) observed a crisis theory from the level of negative impact and defence mechanisms. His analysis showed that no matter how often large-scale crisis situations happen, the human and financial consequences are often unacceptably catastrophic. For future challenges of crisis theory, Reason estimated that it should be related towards development of effective ways of understanding and restraining the occurrence of crisis situations.

Moore (2000) analysed environmental crisis and its relationship with capitalism. He

analysed the crisis chronologically (before, during and after the emergence of a crisis). Christensen and Kohls (2003) explored the ethics of decision-making in corporations during the crisis situation. They presented nine steps which anticipate threats to ethical decision-making in crisis situations. Their research also included comparison of their model with the Jones model (1991) which studied ethical decision-making in crises in terms of size of consequences, the probability of crisis situations and coverage of the critical organizational functions by crisis situation.

Historical overview of crisis situations should start with financial crises that periodically happen and have strong impact on the corporations, citizens and the economy (Kindleberger and Aliber, 2005). The occurrences of a financial crisis affect entire economies. Therefore, establishing business continuity management model and understanding that such crises are cyclically repeating, are the key elements of a long-term corporate survival (Kindleberger and Aliber, 2005). The best examples can be found in the construction industry where financial crisis drastically changed the business prospects. The financial crisis, which hit Southeast Asia in 1997, caused a slowdown in the construction industry and reduced business opportunities (Asia Pacific Economic Cooperation Forum, 1998). In addition to the 60% increase in the number of failed businesses (Singstat, 1999), many corporations began to apply for tenders with extremely low prices and to participate in too many activities that were beyond their capabilities (Balakrishnan, V., 2003).

Corporations nowadays have to be able to deal with all types of crises among which the growing importance is placed on natural disasters. Natural disasters are currently very present. In addition to flooding, potential risks can be detected in earthquakes, tsunamis, landslides, hurricanes and many others. Some natural disasters can be predicted especially if the corporation is located in a risk-prone area (Blyth, 2008). Momani (2010) observed the number of earthquakes with a magnitude higher than 7.0 on the Richter scale and concluded that, since the 1900s, the number of earthquakes remained relatively constant with an average of 20 earthquakes per year. These numbers suggest the need for preparations in the cities located in seismically active areas, because if an earthquake with magnitude greater than 7.0 on the Richter scale occurs in a particular area, its recurrence can be expected.

The optimal approach to illustrate the importance of applying business continuity management model is to describe real examples of crises which have affected corporations. The most momentous example mentioned in the recent literature on business continuity management is a terrorist attack on the World Trade Center on September 11, 2001 which showed unpreparedness of the United States for a terrorist attack. This attack, together with the fall of Enron, was the main cause for introduction of legislative for business continuity management known as SOX which greatly changed perception of crises situations (Spillan and Hough, 2003). The next crisis situation which is most discussed in literature is power failure. The research conducted by KPMG concluded that 70% of surveyed corporations faced a problem of power failure (KPMG, 2002). A recent international study found that 87% of companies that have developed a reaction plan by implementing model of business continuity management for power failure crisis also activated the plan (BC Management, 2009). Crisis situation associated with the production of microprocessors was a fire that affected the Phillips factory in 2000, which was a major Ericsson's supplier

of microchips which use radio frequencies in mobile devices. This situation caused a delay in the procurement process and resulted in a decrease in revenues of $400 million, and even influenced the decision of Ericsson to close down the production of mobile devices (Rice and Caniato, 2003). In 2006 it was estimated that the annual cost of interruption of electricity to the consumers in the US was $ 79 billion. Jennings (2002) research showed that the power failure is the second most common cause of business interruption while the first one is human error.

The risks of business interruption are related to the company's dependency on information technology (IT) infrastructure. A comprehensive approach to business continuity planning is a prerequisite for effective bypassing disturbances in organizations (Cerullo and Cerullo, 2004).

Crisis situations can be described as low-probable, with serious consequences, ambiguous or as ones that require immediate response (Mitroff, Pauchant and Shrivastava, 1988). The literature offers many classifications of risks. Some authors categorise risks into market, credit and operational risks or into strategic and operational risks (Gallagher, 2003). Others cluster them into financial, physical, reputational risks and risk of liability (Blyth, 2009). The third group of authors classify risks into technological risks, human errors and natural disasters (Momani, 2010). There is also classification on the internal and external risks (Peng, Liu and Sio, 2010) with internal division and unintentional and intentional situations (Hiles and Barnes, 2007). The interesting one is the Lalonde's classification (2007). This author described the framework for a review of crisis situations according to the origin (whether induced naturally or by humans), consequences, according to the source or an area that is under

crisis situation and the level of risk. Gundel (2005) developed a typology of crisis situations which distributed them into classical and post-industrial events. His focus was on two criteria of classification: the predictability of crisis situation and the possibility of influencing crisis situation when it occurs.

The terrorist attacks that occurred on the September 11, 2001 in the United States inflicted significant economic consequences and changed trends in perception of business continuity management both in the United States and around the world. The events of September 11 resulted in revision of business continuity management through analysis of business continuity management possibilities and disaster preparedness from perspective of great human losses, raising psychological impact and vulnerability (Castillo, 2004). Furthermore, a high concentration of businesses which were located in the WTO buildings and affected by the attack, pointed out the new challenges that providers of business renewal services need to face in situations when multiple clients activate their business continuity management plan in unintentional security crisis situations.

Modal unintentional crisis situations which are the subject of analysis in many scientific papers are power failures. In addition to power failure, unintentional crisis situations can be, for example, a traffic accident (with major consequences for transport corporations), losses of data files and so on. In addition to unintentional, internal crisis situations are divided into intentional situations: intentional deletion of data, fraud and corruption within the company, sabotage, spreading rumours and somewhat extreme crisis situations like banditry, robbery, kidnapping, ransom, demonstrations, riots, boycotts, strikes and many others. These crisis situations are not as frequent as unintended

situations, but can cause great damage and reduce the company's reputation. In less developed or transition countries there are many examples of fraud and corruption within corporations. According to the re-search conducted by the British Standards Institute, which analysed corporate concerns regarding crisis situations, out of 29 crisis situations, 14 of them were related to internal crisis situations.

External crisis situations are divided into natural disasters and strategic and opera-tional risks. Strategic and operational risks are related more directly to the corporation and its operations while national authorities play an important role in dealing with natural disasters. An important element of business continuity management for facing external crises is the choice of a particular type of in-surance that will sufficiently cover the nega-tive impact of crisis situations. The impor-tance of managing strategic and operational risk is reflected in the following: the unpre-paredness of corporations to face new tech-nologies and substitutes that can cause the collapse, exchange rate fluctuations causing changes in financial results, reputational risk increasing with the occurrence of crisis situ-ation etc. Strategic and operational risks can be described as those which can cause the collapse of an entire corporation. Strategic and operational risks, as well as natural dis-asters, can literally "destroy" the company if there is no business continuity management model that mitigates the negative effects.

The likelihood stands for a possibility of a particular situation to occur. In the case of small number of repetitions, the actual out-come can vary together with the probability of a particular situation. The above is best described by Woitschach (1973) who noted that if someone throws cube 60 times in a

row, numbers from one to six will not appear an equal number of times because all the numbers have the same probability of occur-rence. Understanding likelihood tables is the first step in assessing and controlling risks (Gallagher, 2003). The ways to determine the likelihood, according to the Australian guidelines for crisis situations, can be di-vided into quantitative and qualitative detec-tion of likelihood (Emergency Management Australia, 2000). The quantitative method can set repetition frequency to count the number of repetitions in a given period (for example, 10 times a week, 8 times a year, or three times in 10 years). Another quantitative method is a numerical expression of the like-lihood. This method substantiates numbers from 0 to 1 or from 0% to 100% to describe the likelihood of a situation. The qualitative method of likelihood can be described with use of a Likert scale.

The risk can be described and quantita-tively measured by using a composite meas-ure consisting of (1) impact on corporate profits by decrease in income or an increase in costs, (2) amount of operations affected by the crisis and (3) duration of the crisis situa-tion which shows how long it takes to estab-lish regular operations after the occurrence of a crisis situation (Blyth, 2009). Impact on corporate profit will be the best indicator of crisis situation and it will contribute to a better understanding of the situation. Smith (2009) divided the consequences of a crisis on direct and indirect losses and on the tan-gible and intangible losses. The amount of operations affected explores business areas and operations that, due to the crisis situa-tions, do not have regular working processes and do not have the full operational capacity. Risk management qualitatively analyses the share of employees who are affected by the crisis. This indicator should show how much of operational inefficiency is caused by crisis

situation in a particular area, and preferably, display operating results of the particular division. The important element for any crisis situation is to develop detailed geographical coverage of the corporation through the analysis of the impact of the crisis situation on particular departments, divisions or sectors. Empirically observed, duration of a crisis situation is changeable and depends on the type of crisis situation. External crisis situations last longer than internal crisis situations. An essential factor for risk management is a time period from the occurrence of a crisis situation to re-establishing normal business activities. The corporation must focus on the speed and, much more importantly, on the efficiency of establishing regular operational capabilities. The duration of the crisis situation should be seen as part of the overall composite measure, together with financial impact and geographical coverage.

There are also other ways to express the significance or the impact of a crisis situation on the corporation. Impact of crisis situations can be seen on: the reputation and corporate image, corporate objectives, customers and suppliers, safety of employees (occupational health and safety) and other (Zsidisin, Melnyk and Ragatz, 2005).

3. HYPOTHESIZED MODEL AND HYPOTHESES

Considering these arguments, we proposed the model for developing business continuity management with the following hypotheses (see Figure 1).

H1. Crisis situations are related to the development of business continuity management.

H1a. The external crisis situations are related to the development of business continuity management.

H1b. The internal crisis situations are related to the development of business continuity management.
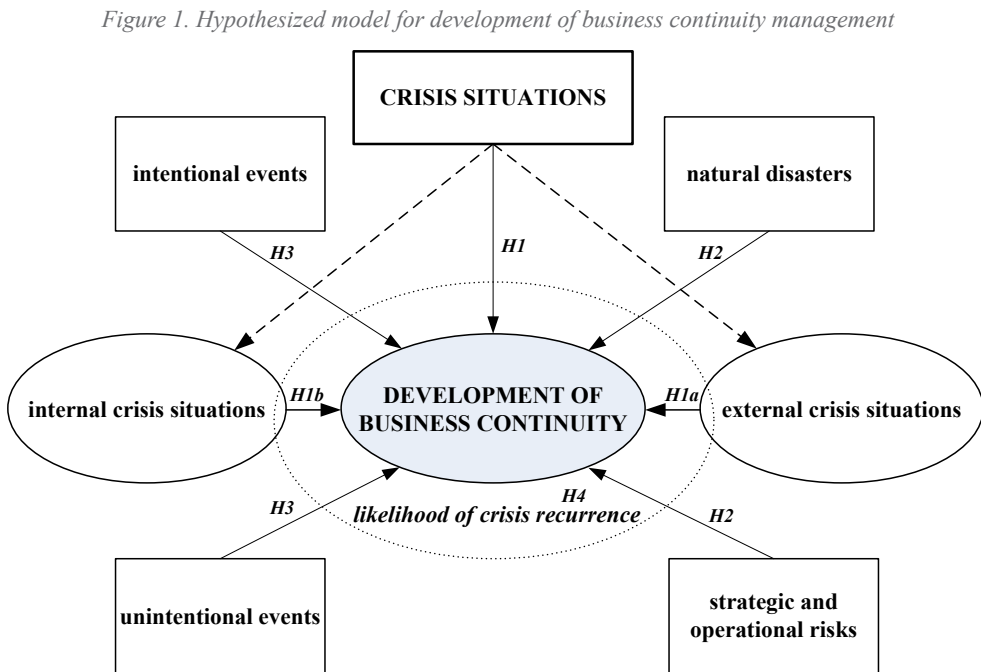
Figure 1. Hypothesized model for development of business continuity management

H1 hypothesis was developed to test the relationship between independent variables representing internal and external crisis situation that may endanger company's business performance and the dependent variable, which represents the development of business continuity management. H1 hypothesis tested the correlation between variables which determine the direction and strength of the relationship between the variables. The strength was ranked by correlation indicator in three categories: poor, medium and strong relation. The direction of relation indicates positive or negative correlation. To this point, relation between internal and external crisis situation and development of business continuity management was not the focus of scientific researches. Some papers dealt with the relations between level of risk and development of business continuity management planning, however, research was done on small samples and perceived risk as a comprehensive category without outlining specific types of crisis situations. H1 hypothesis is divided into H1a and H1b hypotheses with the goal of determining whether there is a relation between external and internal crises and the development of business continuity management. Testing H1a and H1b hypotheses aims to determine in which crisis situations better business continuity management will be developed.

It is important to note that in case the research indicated that external crisis situations have a stronger correlation with the development of business continuity management, it would not mean that external crisis situations are more important than internal. The reason may be that the specialists who develop business continuity management models have developed a stronger perception of the importance of external crises. Some of the reasons may also be the perception of losses caused by external crisis situation or the opinion that external crisis situation affects more significant parts of the corporation in comparison to internal crises.

H2. Strategic and operational risks influence the development of business continuity management more than than natural disasters.

External crisis situations are divided into natural disasters and strategic and operational risks. Natural disasters can be earthquakes, droughts, floods, fires and many others. Strategic risks can be political issues, organized and occasion caused crime, terrorism, reputational risk and other while operating risks can be delays in the supply chain, foreign exchange differences, substitutes, new technologies, customer habits, etc. The assumption is that the strategic and operational risks are strongly correlated with the development of business continuity management, as opposed to natural disasters. The reason for this hypothesis lies in he fact that corporations are more focused on direct protection of business activities, while the protection from natural disasters is provided by the government. Additional reasons for the assumption are: (1) operational risk which characterizes risks in the supply chain is the most common risk in all studies, (2) aversion towards emergence of new technologies caused the downfall of many corporations, (3) foreign exchange gains can cause a decline in financial results of an entire company, (4) reputational risk is a very important element of business continuity management planning, (5) strategic risk can be, for example, the uncertainties connected to the change in the legislative framework for which companies need to prepare on time, and (6) espionage and falsification which are strategically important risk for corporations which are using new, sophisticated technology.

H3. Unintended crisis situations influence on the development of business continuity management more than intentional crisis situations.

Hypothesis H3 is focused on the detailed elaboration of internal crises, which are divided into unintentional and intentional situations. Unintended situations which can cause business losses are the loss of electricity, technological crisis, problems with energy production, software problems including damage of computer or loss of data files; traffic accidents, and other situations. Intentional situations are intentional deletion of data, fraud and corruption within the company, sabotage, spreading rumours and somewhat extreme crisis situations as robbery, kidnapping, ransom, demonstrations, riots, boycotts, strikes and many others. H3 postulates that unintentional crisis situations have a higher correlation with the development of business continuity management.

H4. The likelihood of crisis recurrence is associated with the development of business continuity management.

The development of business continuity management does not depend only on the probability of repetition, but also on: potential damage which is a result of a crisis situation, duration of crisis situation, part of the corporation (department, sector) that was affected by the crisis, financial situation, the experience with crisis situations etc. However, hypothesis H4 focuses on probability of recurrence of crises, while other variables can be interesting subjects for future research.

4. METHODS AND RESULTS

Measuring instrument (questionnaire) for the hypotheses verification consisted of a set of questions to which the respondents (employees or managers responsible for business continuity management) expressed their agreement/disagreement by using five-point Likert scale. Items used in the

questionnaire were originally developed for the purpose of this research (for the segment of the questionnaire that evaluated all types of crises situations) or revised and adapted from existing measurement scales that can be found in the relevant scientific literature (for the segment of the questionnaire that investigated the development of business continuity management). Empirical research was conducted in Croatian companies in the period from June 2016 to January 2017. The questionnaire was sent to 250 addresses based on desk research of large companies, according to the Accounting Act, in Republic of Croatia in which authors identified some form of business continuity management activities and responsibilities (on personal and/ or departmental level). In the 60 days after the beginning of primary research, 62 questionnaires were filled out, which represents a rate of return of 24.8%, and by the end of January 2017 a total of 106 completed questionnaires were received (return rate 42.4%). Descriptive statistics regarding respondents and companies included in the research is presented in Table 1.

The analysis of the overall risk level, likelihood of crisis situations recurrence and development of business continuity management was conducted for each group of risk situations (natural disasters, strategic and operational risks, and intentional and unintentional crisis situations). The overall level of risk is quantified as the composite arithmetic mean variable based on three elements: the duration of recovery, the impact on profits and amount of operations affected by the crisis. The maximum value of the composite risk is 15 because each indicator could be assessed with Likert scale from one to five. Apart from the composite risk, the likelihood of crisis recurrence is quantified for the purposes of testing H4 hypothesis with the maximum value of five. In addition to the correlations for each crisis situation, a slope

Table 1. Descriptive statistics of the sample

Characteristics	Sample (%)
Working experience	Less than 5 years - 17% Between 6 and 10 years - 32% Between 11 and 15 years - 36% Between 16 and 20 years - 9% More than 20 years - 6%
Working experience in the field of business continuity management	Less than 5 years - 36% Between 6 and 10 years - 40% Between 11 and 15 years - 13% Between 16 and 20 years - 6% More than 20 years - 5%
Education	High school degree - 23% Bachelor degree - 7% Master degree - 55% MBA, Ph.D. - 15%
Ownership of the company	Mostly state-owned company - 5% Mostly privately-owned company - 53% International ownership - 42%
Dominant sector	Agriculture, forestry and fishing – 2% Manufacturing – 23% Construction – 14% Transportation and communications – 13% Wholesale and retail trade – 10% Tourism and hospitality – 19% Financial and other business activities – 11% Engineering – 8%

Source: authors.

is shown to indicate the impact on the development of business continuity management. It shows how business continuity management grows as the overall level of risk or the probability of recurrence increases by one.

The dependent variable is the level of development of business continuity management and it is quantified by the sum of the ranges from one to five for all eight separate units used to test the level of development of business continuity management. For each of the eight separate units, rank from one to five is determined by the proportionate share of answer "Yes" in the total number of responses. For example, in the second unit which examines whether the business continuity management plan includes risk assessment and control, there were eight questions on this criterion. If the respondent answered four of the eight with the positive response, his share of positive answers was 50%. With proportional division of 100% of the data in the scale from one to five it is calculated that the share of positive answers from 50% belongs to the rank 3 because it represents the proportion of positive responses from 40 to 60%.

H1. Crisis situations are associated with the development of business continuity management.

The research results are presented in Table 2.

Table 2. Results of H1 hypothesis

Indicator	Coefficient
Sample (N)	106
Coefficient of determination (R^2)	0,45
Correlation (R)	**0,67**
β_0	17,76
β_1 (slope)	**1,37**
P- value for β_1	0,0153
Y_i	Development of business continuity management $Y_i \in [0,40]$
X_i	Total risk of internal and external crisis situations $X_i \in [0,15]$
Equation ($\hat{Y}$)	$\hat{Y} = 17,76 + 1,37X$

Source: authors.
Variables:
X_i - composite risk arithmetic mean (the duration of recovery, the impact on profits and the amount of operations affected by the crisis) for all external crisis situations.
Y_i - the sum of the ranges from one to five for eight separate units which measured the level of development of business continuity management.

With a significance level of 5%, the assumption that crisis situations are not associated with the development of business continuity management can be rejected. Correlation between crisis situations and development of business continuity management is positive (0,67), which means that the correlation is of medium strength and indicates that the increase of the risk of a crisis situation will also increase the degree of development of business continuity management. β_1 coefficient is 1,37. If the overall risk of crisis situations increases by one, the development of business continuity management will increase on average by 1.37 (slope). With a significance level of 5% H1 hypothesis is accepted which means that the crisis situations are connected with the development of business continuity management.

H1a. External crisis situations related to the development of business continuity management.

The research results are presented in Table 3.

With a significance level of 5% the assumption that the external crisis situations are not associated with the development of business continuity management of the company can be rejected. Correlation between external crisis situations and business development continuity is positive (0,71) which means that the relationship is of medium strength, and indicates that the increase of the risk of a crisis situation will increase the degree of development of business continuity management. β_1 coefficient is 1,14. If the overall risk of external crisis situations increases by one, the development of business continuity management will increase on average by 1,14 (slope). With a significance level of 5% H1a hypothesis is accepted which means that the external crisis situations are connected with the development of business continuity management.

H1b. Internal crisis situations related to the development of business continuity management.

The research results are presented in Table 4.

Table 3. Results of H1a hypothesis

Indicator	Coefficient
Sample (N)	106
Coefficient of determination (R^2)	0,50
Correlation (R)	**0,71**
β_0	19,76
β_1 (slope)	**1,14**
P- value for β_1	0,0126
Y_i	Development of business continuity management for external crisis situations $Y_i \in [0,40]$
X_i	Total risk of external crisis situations $X_i \in [0,15]$
Equation ($\hat{Y}$)	$\hat{Y} = 19,36 + 1,14\,X$

Source: authors.
Variables:
Xi - composite risk arithmetic mean (the duration of recovery, the impact on profits and the amount of operations affected by the crisis) for all external crisis situations.
Yi - the sum of the ranges from one to five for eight separate units which measured the level of development of business continuity management of the company for external crisis situations.

Table 4. Results of H1b hypothesis

Indicator	Coefficient
Sample (N)	106
Coefficient of determination (R^2)	0,56
Correlation (R)	**0,75**
β_0	21,28
β_1 (slope)	**1,54**
P- value for β_1	0,0097
Y_i	Development of business continuity management for internal crisis situations $Y_i \in [0,40]$
X_i	Total risk of internal crisis situations $X_i \in [0,15]$
Equation ($\hat{Y}$)	$\hat{Y} = 21,28 + 1,54\,X$

Source: authors.
Variables:
Xi - composite risk arithmetic mean (the duration of recovery, the impact on profits and the amount of operations affected by the crisis) for all internal crisis situations.
Yi - the sum of the ranges from one to five for eight separate units which measured the level of development of business continuity management of the company for internal crisis situations.

Table 5. Impact of natural disasters on business continuity management development

Indicator	Coefficient
Sample (N)	106
Coefficient of determination (R^2)	0,61
Correlation (R)	**0,78**
β_0	16,48
β_1 (slope)	**0,98**
P- value for β_1	0,0142
Y_i	Development of business continuity management for natural disasters $Y_i \in [0,40]$
X_i	Total risk of natural disasters $X_i \in [0,15]$
Equation ($\hat{Y}$)	$\hat{Y} = 16,48 + 0,98\,X$

Source: authors.
Variables:
Xi - composite risk arithmetic mean (the duration of recovery, the impact on profits and the amount of operations affected by the crisis) for all natural disasters.
Yi - the sum of the ranges from one to five for eight separate units which measured the level of development of business continuity management of the company for natural disasters.

With a significance level of 5% the assumption that the internal crisis situations are not associated with the development of business continuity management of the company can be rejected. Correlation between external crisis situations and business continuity management development is positive (0,75) which means that the relationship is of medium strength, and indicates that the increase of the risk of a crisis situation will increase the degree of development of business continuity management. β_1 coefficient is 1,14. If the overall risk of internal crisis situations increases by one, the development of business continuity management will increase on average by 0,56 (slope). With a significance level of 5% H1b hypothesis is accepted which means that the internal crisis situations are connected with the development of business continuity management.

H2. Strategic and operational risks influence on the development of business

continuity management more than natural disasters.

Results are shown in Table 5 and Table 6.

With a significance level of 5% the assumption that natural disasters are not associated with the development of business continuity management can be rejected. Correlation between natural disasters and business continuity management development is positive (0,78) which means that the relationship is of medium strength, and indicates that the increase of the risk of natural disasters will increase the degree of development of business continuity management. β_1 coefficient is 0,98. If the overall risk of natural disasters increases by one, the development of business continuity management of the company will increase on average by 0,98 (slope).

With a significance level of 5% the assumption that the strategic and operational

Table 6. Impact of strategic and operational crisis situations on business continuity management development

Indicator	Coefficient
Sample (N)	106
Coefficient of determination (R^2)	0,67
Correlation (R)	**0,82**
β_0	16,15
β_1 (slope)	**1,21**
P- value for β_1	0,0097
Y_i	Development of business continuity management for strategic and operational crisis situations $Y_i \in [0,40]$
X_i	Total risk of strategic and operational crisis situations $X_i \in [0,15]$
Equation ($\hat{Y}$)	$\hat{Y} = 16,15 + 1,21\,X$

Source: authors.

Variables:

Xi - composite risk arithmetic mean (the duration of recovery, the impact on profits and the amount of operations affected by the crisis) for all strategic and operational crisis situations.

Yi - the sum of the ranges from one to five for eight separate units which measured the level of development of business continuity management of the company for strategic and operational crisis situations.

crisis situations are not associated with the development of business continuity management can also be rejected. Correlation between strategic and operational crisis situations and business continuity management development is positive (0,82) which means that the relationship is strong, and indicates that the increase of the risk of strategic and operational crisis situation will increase the degree of development of business continuity management. β_1 coefficient is 1,21. If the overall risk of strategic and operational crisis situations increases by one, the development of business continuity management will increase on average by 1,21 (slope).

According to Tables 5 and 6, it can be concluded that H2 can be accepted with a significance level of 5% which means that strategic and operational risk situations influence the business continuity management development more than natural disasters.

H3. Unintentional crisis situations influence on the development of business continuity management more than intentional crisis situations.

Results are shown in Table 7 and Table 8.

With a significance level of 5% the assumption that unintentional crisis situations are not associated with the development of business continuity management can be rejected. Correlation between unintentional crisis situations and business continuity management development is positive (0,85) which means that the relationship is strong, and that the increase of the risk of unintentional crisis situation will increase the degree of development of business continuity management. β_1 coefficient is 1,64. If the overall risk of unintentional crisis situations increases by one, the development of business continuity management will increase on average by 1,64 (slope).

Table 7. Impact of unintentional crisis situations on business continuity management development

Indicator	Coefficient
Sample (N)	106
Coefficient of determination (R^2)	0,72
Correlation (R)	**0,85**
β_0	20,18
β_1 (slope)	**1,64**
P- value for β_1	0,0042
Y_i	Development of business continuity management for unintentional crisis situations $Y_i \in [0,40]$
X_i	Total risk of unintentional crisis situations $X_i \in [0,15]$
Equation ($\hat{Y}$)	$\hat{Y} = 20{,}18 + 1{,}64\,X$

Source: authors.

Variables:
Xi - composite risk arithmetic mean (the duration of recovery, the impact on profits and the amount of operations affected by the crisis) for unintentional crisis situations.
Yi - the sum of the ranges from one to five for eight separate units which measured the level of development of business continuity management of the company for unintentional crisis situations.

Table 8. Impact of intentional crisis situations on business continuity management development

Indicator	Coefficient
Sample (N)	106
Coefficient of determination (R^2)	0,72
Correlation (R)	**0,79**
β_0	22,18
β_1 (slope)	**1,45**
P- value for β_1	0,0088
Y_i	Development of business continuity management for intentional crisis situations $Y_i \in [0,40]$
X_i	Total risk of intentional crisis situations $X_i \in [0,15]$
Equation ($\hat{Y}$)	$\hat{Y} = 22{,}18 + 1{,}45\,X$

Source: authors.

Variables:
Xi - composite risk arithmetic mean (the duration of recovery, the impact on profits and the amount of operations affected by the crisis) for intentional crisis situations.
Yi - the sum of the ranges from one to five for eight separate units which measured the level of development of business continuity management of the company for intentional crisis situations.

With a significance level of 5% the assumption that intentional crisis situations are not associated with the development of business continuity management can be rejected. Correlation between intentional crisis situations and business continuity management development is positive (0,85) which means that the relationship is strong, and that the increase of the risk of intentional crisis situation will increase the degree of development of business continuity management. β_1 coefficient is 1,45. If the overall risk of intentional crisis situations increases by one, the development of business continuity management will increase on average by 1,45 (slope).

According to Tables 7 and 8, it can be concluded that H3 can be accepted with a significance level of 5% which means that unintended risks influence the business continuity management development more than intentional risk situations.

H4. The likelihood of crisis recurrence is associated with the development of business continuity management.

With a significance level of 5% the assumption that the probability of crisis situation repetition is associated with the development of business continuity management of the company can be rejected (Table 9).

Correlation is 0,48 which means that the relationship is small and positive. The coefficient of determination is 0,23, which means that the equation interpreted 23% of the total departures. β_1 coefficient is 0,54. If the probability of crisis situations increases by one, the development of business continuity management will increase on average by 0,54 (slope).

After the rejection of H4 hypothesis because of the insignificant results, analysis of the relationship between certain groups of crisis situations (natural disasters, operational and strategic risks and unintentional and intentional crisis situations) and the development of business continuity management is completed.

With a significance level of 5% the assumption that the probability of natural

Table 9. Results of H4 hypothesis

Indicator	Coefficient
Sample (N)	106
Coefficient of determination (R^2)	0,23
Correlation (R)	**0,48**
β_0	25,18
β_1 (slope)	**0,54**
P- value for β_1	0,1397
Y_i	Development of business continuity management $Y_i \in [0,40]$
X_i	Likelihood of crisis situations recurrence $X_i \in [0,5]$
Equation ($\hat{Y}$)	$\hat{Y} = 25,18 + 0,54\, X$

Source: authors.

Variables:

Xi - arithmetic mean of crisis situation recurrence likelihood

Yi - the sum of the ranges from one to five for eight separate units which measured the level of development of business continuity management of the company for intentional crisis situations.

Table 10. H4 hypothesis - natural disasters

Indicator	Coefficient
Sample (N)	106
Coefficient of determination (R^2)	0,16
Correlation (R)	**0,40**
β_0	25,18
β_1 (slope)	**0,17**
P- value for β_1	0,1544
Y_i	Development of business continuity management for natural disasters $Y_i \in [0,40]$
X_i	Likelihood of crisis situations recurrence $X_i \in [0,5]$
Equation ($\hat{Y}$)	$\hat{Y} = 25{,}21 + 0{,}17\,X$

Source: authors.
Variables:
Xi - arithmetic mean of natural crisis situation recurrence likelihood
Yi - the sum of the ranges from one to five for eight separate units which measured the level of development of business continuity management for natural disasters.

disasters recurrence is associated with the development of business continuity management can be rejected (Table 10).

Correlation (0,40) is small and positive. The coefficient of determination is 0,16, which means that only 16% of total variation of outcomes may be explained with the equation. β_1 coefficient is 0,17. If the probability of crisis situations recurrence increases by one, the development of business continuity management will increase on average by 0,54 (slope).

It can be concluded that the likelihood of natural disasters recurrence has no influence on the development of business continuity management. The reason for this conclusion is small likelihood of natural disasters recurrence on which companies must think *ex ante*. If the company faced natural disaster unprepared, weight of consequences can easily lead to the termination of business.

With the significance level of 5% the thesis that the likelihood of strategic and operational crisis situations repetition is associated with the development of business continuity management of the company can also be rejected (Table 11).

Correlation (0,43) is small and positive. The coefficient of determination is 0,18, which means that only 18% of total variation of outcomes can be explained with the equation. β_1 coefficient is 0,17. If the probability of strategic and operational crisis situations recurrence increases by one, the development of business continuity management will increase on average by 0,17 (slope).

It can be concluded that the likelihood of strategic and operational crisis situations recurrence has no influence on the development of business continuity management. The reason for that is small likelihood of strategic and operational crisis situations

Table 11. H4 hypothesis - strategic and operational crisis situations

Indicator	Coefficient
Sample (N)	106
Coefficient of determination (R^2)	0,18
Correlation (R)	**0,43**
β_0	24,59
β_1 (slope)	**0,21**
P- value for β_1	0,1321
Y_i	Development of business continuity management for strategic and operational crisis situations $Y_i \in [0,40]$
X_i	Likelihood of strategic and operational crisis situations recurrence $X_i \in [0,5]$
Equation ($\hat{Y}$)	$\hat{Y} = 24,59 + 0,21\,X$

Source: authors.
Variables:
Xi - arithmetic mean of strategic and operational crisis situations recurrence likelihood
Yi - the sum of the ranges from one to five for eight separate units which measured the level of development of business continuity management for strategic and operational crisis situations.

Table 12. H4 hypothesis - unintentional crisis situations

Indicator	Coefficient
Sample (N)	106
Coefficient of determination (R^2)	0,42
Correlation (R)	**0,65**
β_0	23,48
β_1 (slope)	**1,61**
P- value for β_1	0,0297
Y_i	Development of business continuity management for unintentional crisis situations $Y_i \in [0,40]$
X_i	Likelihood of unintentional crisis situations recurrence $X_i \in [0,5]$
Equation ($\hat{Y}$)	$\hat{Y} = 23,48 + 1,61\,X$

Source: authors.
Variables:
Xi - arithmetic mean of unintentional crisis situations recurrence likelihood
Yi - the sum of the ranges from one to five for eight separate units which measured the level of development of business continuity management for unintentional crisis situations.

recurrence. Infrequent appearance of strategic and operational crisis situations is the reason why the appearance of these crises does not affect the development of business continuity management.

With the significance level of 5% the thesis that the likelihood of unintentional crisis situations recurrence is associated with the development of business continuity management can be accepted (Table 12).

Correlation (0,65) is of medium strength and positive. The coefficient of determination is 0,42, which means that 42% of total variation of outcomes can be explained with the equation. β_1 coefficient is 1,61. If the probability of unintentional crisis situations recurrence increases by one, the development of business continuity management will increase on average by 1,61 (slope).

It can be concluded that the likelihood of unintentional crisis situations recurrence

has influence on the development of business continuity management. The reason for that is higher likelihood of unintentional crisis situations recurrence against external crisis situations whose impact has not been proved. Frequent appearance of unintentional crisis situations is the reason why appearance of these crises affects the development of business continuity management.

With the significance level of 5% the thesis that the likelihood of intentional crisis situations recurrence is associated with the development of business continuity management can be accepted (Table 13).

Correlation (0,61) is of medium strength and positive. The coefficient of determination is 0,37, which means that 37% of total variation of outcomes can be explained with the equation. β_1 coefficient is 1,48. If the likelihood of intentional crisis situations recurrence increases by one, the development of business continuity management will

Table 13. H4 hypothesis - intentional crisis situations

Indicator	Coefficient
Sample (N)	106
Coefficient of determination (R^2)	0,37
Correlation (R)	**0,61**
β_0	24,01
β_1 (slope)	**1,48**
P- value for β_1	0,0324
Y_i	Development of business continuity management for intentional crisis situations $Y_i \in [0,40]$
X_i	Likelihood of intentional crisis situations recurrence $X_i \in [0,5]$
Equation ($\hat{Y}$)	$\hat{Y} = 24,01 + 1,48\, X$

Source: authors.
Variables:
Xi - arithmetic mean of intentional crisis situations recurrence likelihood
Yi - the sum of the ranges from one to five for eight separate units which measured the level of development of business continuity management for intentional crisis situations.

increase on average by 1,48 (slope). It can be concluded that the likelihood of intentional crisis situations recurrence has influence on the development of business continuity management. The reason for that is higher likelihood of intentional crisis situations recurrence against external crisis situations whose impact has not been proved.

5. CONCLUSION

The study focused on the influence of crisis situations on development of business continuity management in Croatian companies. Categories whose influences were observed were the external crisis situations versus internal crises, natural disasters versus strategic and operational risks, unintended situations versus intentional situations. With a significance level of 5% H1 hypothesis was accepted which means that the crisis situations are connected with the development of business continuity management. Hypothesis H1a tested the correlation between external crisis situations and business continuity management development. With a significance level of 5% H1a hypothesis was accepted which means that the external crisis situations are connected with the development of business continuity management. Hypothesis H1b tested the correlation between internal crisis situations and business continuity management development. Correlation between external crisis situations and business continuity management development is also positive and of medium strength, meaning that the increase of the risk of a crisis situation will increase the degree of development of business continuity management. Hypothesis H2 tested the influence of strategic and operational risks on business development continuity, versus the impact which natural disasters have on this development. Hypothesis testing was carried out in two steps. The first step was the analysis

of correlation between natural disasters and business continuity management development. There is a positive correlation of medium strength. The second step in testing hypothesis H2 was the analysis of correlation between strategic and operational crisis situations and business continuity management development. Correlation between strategic and operational crisis situations and business continuity management development is positive and strong. Hypothesis H3 tested the influence of unintentional crisis situations on business continuity management development against influence of intentional crisis situations. Influence of unintentional crisis situations on business continuity management development was tested in the first step. Correlation between unintentional crisis situations and business continuity management development was positive and strong. In the second step of testing hypothesis H3, the influence of intentional crisis situations on business continuity management development was tested. Correlation between intentional crisis situations and business continuity management development was, also, positive and strong. Hypothesis H4 tested the impact and relation of the crisis situation recurrence on the development of business continuity management. With a significance level of 5%, the assumption that the likelihood of crisis situation recurrence is associated with the development of business continuity management, was rejected. After the rejection of hypothesis H4, analyses of the relationship between certain groups of crisis situations (natural disasters, operational and strategic risks and unintentional and intentional crisis situations) and the development of business continuity management were conducted.

Scientific contribution of this paper lies in the development of business continuity management model. Theoretical contribution of this paper is related to the advancement of

the existing literature since the analyses of different crises situations are measured as composite variables. Previous research focused on risks and crisis situations in addition to their impact on business continuity management. Due to the incompleteness of previous research, this study may present an important perspective and forward the discussion in the field of business continuity management. This research specifically contributed by analysing the types of crisis situations and likelihood of crises recurrence in addition to their impact on business continuity management development. If companies do not identify risks and threats, there will be no strategy for managing these situations and this can cause business losses.

In conclusion, we would also like to emphasise that prediction of crisis situations is the initial step in business continuity management planning. Active enterprises predict and prevent the crisis situations, while, in passive ones, establishment of business continuity management model is mediated by the intensity of crisis situation recurrence. In this case, the business continuity management develops, when the likelihood of crisis recurrence comes to a critical level. According to the results of empirical research, it can be concluded that Croatian

companies are active, because the relationship between the likelihood of recurrence and development of the business continuity management could not be established.

Limitation of this research is the inability of comparison research results with the results of research in other countries and this is due to the lack of data on crises composite measures in other countries. The study was conducted in companies operating in different industries which also represent important limitation as well as the usage of identical measuring instrument for internal and external crisis situations.

Recommendation for future research would be to analyse only one group of crisis situations, to conduct it by using a measuring instrument adapted to each crisis situation in order to test the impact of crisis situations more accurately and to focus the research on different segments. For example, research of the reputational risk of the crisis situation and its dependence on other crisis situations. Other example of future research includes testing computer breakdown crisis situation, but expanded with the breakdowns on computers with a single user and computers with multiple users as well as the breakdowns of computers used as servers etc.

LITERATURE:

1. Balakrishnan, V. (2003). *Ministry of National Development Speech for Singapore Institute of Surveyors & Valuers (SISV) Annual Dinner*, accessed at http://www.mnd.gov.sg/newsroom/speeches/speeches _snd2003_190703. htm on 10 October 2017.

2. Bhragva, R. (2012). *15 Marketing Trends in 2013 And How Your Business Can Use Them.* Washington: Likeonomics.

3. Blyth, M. (2008). *Risk and Security Management: Protecting People and*

Sites Worldwide. New York: John Wiley & Sons.

4. Blyth, M. (2009). *Business Continuity Management: Building an Effective Incident Management Plan*. New Jersey: Wiley.

5. Castillo, C. (2004). Disaster preparedness and business continuity management planning at Boeing: An integrated model, *Journal of Facilities Management*, *3*(1), 8-26.

6. Cerullo, V., & Cerullo, M. J. (2004). Business Continuity Planning: A Com-

-prehensive Approach. *Information Systems Management*, 21(3), 70-78.

7. Cheval, S. (2012). *Natural Disasters*. South Carolina: Hazard Research Lab.

8. Christensen, S. L., Kohls, J. (2003). Ethical Decision Making in Times of Organizational Crisis, *Business & Society*, *42*(3), 328-358.

9. Elliott, D. (2009) The Failure of Organizational Learning from Crisis - A Matter of Life and Death?, *Journal of Contingencies and Crisis Management,* 17(3), 157-168.

10. Gallagher, M. (2003). *Business continuity management: How to protect your company from danger*. London: FT Prentice Hall.

11. Gilbert, G. A., Gips, M. A. (2000). Supply side contingency planning, *Security Management*, *44*(3), 70-73.

12. Gundel, S. (2005). Towards a new typology of crises, *Journal of Contingencies and Crisis Management*, 13(3), 106-115.

13. Gupta, P., Prakash, S., Jayaraman, U. (2010). *IT Infrastructure and its Management*. New Delhi: Tata McGraw Hill.

14. Herbane, B. (2010). The evolution of business continuity management: A historical review of practices and drivers, *Business History*, 52(6), 978-1002.

15. Herbane, B., Elliott, D., Swartz, E. M. (2004). Business Continuity Management: time for a strategic role?, *Long Range Planning,* 37(5), 425.

16. Hiles, A., & Barnes, P. (2007). *The Definitive Handbook of Business Continuity Management*. Chichester: John Wiley & Sons Ltd.

17. Jennings, M. (2002). The benefits of emergency notification systems, *Disaster Recovery Journal*, *15*(4), 54-55.

18. Jones, T. M. (1991). Ethical decision making by individuals in organizations: An issue contingent model, *Academy of Management Review*, *16*(1), 366-395.

19. Kindleberger, C. P., Aliber, R. Z. (2005). *Najveće svjetske financijske krize: Manije, panike i slomovi*. Zagreb: Masmedia.

20. KPMG (2002). *Business Continuity Study: Benchmark Report A review of the factors influencing Business Continuity in the next millennium*. Benchmark Report. Contingency Planning and Management, accessed at http://www.auditnet.org/docs/BCP/ Business Continuity Report Benchmark Study.pdf on 10 September 2017.

21. Lalonde, C. (2007). Crisis management and organizational development: towards the conception of a learning model in crisis management, *Proceedings of OLKC 2007 – "Learning Fusion"*, 1(1), 507-513.

22. Maitra, S., Shanker, M., Mudholkar, P.K. (2013). *Business Continuity and Disaster Recovery*.

23. Experience in Indian Banks. *International Journal of Latest Trends in Engineering and Technology,* 2(4), 526-534.

24. Mitroff, I. I., Pauchant, T. C., Shrivastava, P. (1988). The structure of manmade organizational crises. Conceptual and empirical issues in the development of a general theory of crisis management, *Technological Forecasting and Social Change*, *33*(2), 83-107.

25. Momani, N. M. (2010). Continuity Planning: Are We Business Prepared for Future Disasters, *American Journal of Economics and Business Administration*, *2*(3), 272-279.

26. Moore, J. W. (2000). Environmental crises and the metabolic rift in world-historical perspective, *Organization & Environment,* 13(2), 123-157.

27. Pauchant, T. C., Mitroff, I. I. (1990). Crisis management: Managing paradox in a chaotic world, *Technological Forecasting and Social Change*, *38*(2), 117-134.

28. Pearson, C. M., Mitroff, I. I. (1993). From Crisis Prone to Crisis Prepared: A Framework for Crisis Management, *Academy of Management Executive,* 7(1), 48-59.

29. Radović, V., Domazet, S. (2016). Konkurentnost privrede Republike Srbije u kontekstu pretnji od postojećih vanrednih situacija. *Ecologica,* 23(82), 211-217.

30. Radović V., Mitić, P., Raspopović, N. (2013). Implementation concept of ''Business crises and continuity management'' a great challenge in the recovery process of Serbian Economy. In: Čaleta, D., Vršec., M. (Eds.) *Management of Corporate Security - New Approaches and Future Challenges*. Institute for Corporative Security Studies - ICS, Ljubljana, Slovenia, 115-128.

31. Reason, J.T. (1997). *Managing the Risks of Organizational Accidents.* Burlington: Ashgate Publishing Company.

32. Rice, J.B., & Caniato, F. (2003). Building a secure and resilient supply network, *Supply Chain Management,* 7(5), 22-30.

33. Savage, M. (2002). Business continuity planning. *Work Study,* 51(5), 254-261.

34. Shaw, G. L., & Harrald, J. R. (2004). Required Competencies for Executive Level Business Crisis and Continuity Managers. *Journal of Homeland Security and Emergency Management,* 3(1), 1-36.

35. Singstat (1999). *Formation and Cessation of Companies and Businesses 1998*, accessed at http://www.singstat.gov.sg/pubn/papers/economy/ssn2q99-pg16-17.pdf on 5 October 2017.

36. Smith, K. (2009). *Environmental Hazards: Assessing Risk and Reducing disaster. London: Routledge.*

37. Spillan, J., Hough, M. (2003). Crisis planning in small businesses: Importance, impetus and indifference, *European Management Journal,* 21(3), 398-407.

38. Sui, P.L., Junying, L., Stephen, S. (2010). Business continuity management management in large construction companies in Singapore, *Disaster Prevention Management,* 19(2), 219-232.

39. Turner, B.A. (1976). The organizational and interorganizational development of disasters, *Administrative Science Quarterly,* 21(3), 378-397.

40. Weick, K., Sutcliffe, K. (2003). Hospitals as cultures of entrapment: A re-analysis of the Bristol Royal Infirmary, *California Management Review,* 45(2), 73-84.

41. Woitschach, M. (1973). *Wahrscheinlichkeit und Zufall Moderne Mathematik programmiert.* Landsberg: Moderne Industrie.

42. Wong, W. N. Z. (2009). The strategic skills of business continuity managers: Putting business continuity management into corporate long-term planning. *Journal of Business Continuity & Emergency Planning,* 4(1), 62-68.

43. Zsidisin, G.A., Melnyk, S.A., Ragatz, G.L. (2005). An institutional theory perspective of business continuity management planning for purchasing supply chain management, *International Journal of Production Research*, 43(16), 3401-3417.

DJELOVANJE KRIZNIH SITUACIJA NA RAZVOJ UPRAVLJANJA POSLOVNIM KONTINUITETOM U HRVATSKOJ

SAŽETAK

Ovaj se rad usredotočuje na utjecaje različitih kriznih situacija na razvoj upravljanja poslovnim kontinuitetom. U tu je svrhu provedena kvantitativno empirijsko istraživanje u hrvatskim poduzećima te testiran pretpostavljeni model upravljanja poslovnim kontinuitetom. Krizna je situacija mjerena korištenjem kompozitne varijable, zasnovane na trima odrednicama: vremenu oporavka, djelovanjem na profite te obuhvatu operacija, na koje kriza djeluje. Korelacija između pojave kriznih situacija i upravljanja poslovnim kontinuitetom ukazuje da povećanje rizika krize povećava i razinu razvoja upravljanja

poslovnim kontinuitetom. Nadalje, strateški i operativni rizici u većoj mjeri djeluju na razvoj upravljanja poslovnim kontinuitetom od prijetnji uslijed prirodnih katastrofa. Isto vrijedi za neočekivane rizike, kada se uspoređuju s očekivanim rizicima. Drugi se dio istraživanja usredotočuje na vjerojatnost utjecaja ponavljanja krizne situacije u odnosu na razvoj upravljanja poslovnim kontinuitetom. Najznačajniji doprinos ove studije temelji se na modeliranju razvoja upravljanja poslovnim kontinuitetom, utemeljenom na razlikovanju različitih kriznih situacija i vjerojatnosti ponovnog razvoja krize.