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Contact to corresponding author: maria.hudakova@fbi.uniza.sk; University of Zilina, Faculty of Security Engineering, Department of Crisis Management, Univerzitna 8215/1, Zilina, Slovakia.

Mária Hudáková
University of Zilina, Slovakia

Ján Dvorský
Tomas Bata University in Zlín, Czech Republic

Assessing the risks and their sources in dependence on the rate of implementing the risk management process in the SMEs

Abstract

Research background: The managers have a key position in process of management risk. The managers are able to implement the risk management process in the companies with an emphasis on preventing the company crises using the appropriate methods and tools for the early identification of the changes if the entrepreneurial environment develops negatively. Does a manager have enough knowledge and awareness about the potential risk sources in company?

Purpose of the article: The essence of this article is to assess the sources of the market, economic, financial, operational, HR, security and legal risk depending on the rate of implementing the risk management process in the small and medium-sized enterprises (SMEs).

Methods: We realized the risk assessment process on the basis of evaluations by 487 managers who gave their opinions to selected risks and their sources in the SMEs in Slovakia. Subsequently, we utilized the methods and tools of the mathematical statistics (descriptive statistics, comparison, Z-score for 2 population proportions, Chi-squared test for 5 x 2 contingency table).

Findings & Value added: The strongest dependence perceived by the SME-entrepreneurs lies between the development of the tax and insurance burdens as the source of the economic risk and the criterion of the "level of the risk management in the company". The overall results of the empirical research underline the significance and importance of dealing with the assessment of the key risks and their sources in the Slovak SMEs. The results having been processed are the basic material for the professional public and other organizations whose effort is to help the companies in an effective implementation of the risk management process in the Slovak enterprises.

Introduction

The current dynamic changes of the entrepreneurial environment, many failures and bankruptcies of the renowned companies, as well as the global financial crisis, have significantly changed the view of the risk management in the companies all over the world. More and more companies, and not only the large ones, begin to realise the need and importance of the risk management (Hudáková & Lusková, 2016; Meluzín *et al*., 2017; 2018a; 2018b). The managers are under an increased pressure and have to make important decisions to ensure prosperity, financial stability, and competitiveness in the conditions of uncertainty and risk (Agarwal & Ansell, 2016). The studies published abroad (*Global risk management survey*, 2018; *The American Institute of CPAs*, 2017; *Enterprise risk management initiative*, 2017) document the *positive influences of the risk management* on making decisions in the environment of the risks, on the quality of the information provided, on increasing the company value, on ensuring its competitiveness, on achieving constant improvements and on the prevention in the framework of ensuring a continuous operation of the enterprise. Significant global investors have a similar opinion, and say they have no aversion against the risk, but they feel aversion towards surprises and, therefore, require a larger transparency of the companies concerning the risk management (Bogodistov & Wohlgemuth, 2017; Cettolin *et al*., 2017). They are sure that the reliable risk management ensures fewer negative surprises, a larger financial stability of the companies and it provides opportunities to achieve profits. According to the aforementioned investigations, the companies worldwide attempt (*Global risk management survey*, 2018; *The American Institute of CPAs*, 2017; *Global Management Accountant - Global State of Enterprise Risk Oversight*, 2017) to implement the risk management to the planning and decision-making process, i.e. they systematically consider the possible risks when making decisions. They link the risk strategy with the company strategic planning and inform the top management about the most serious risks.

Due to implementing the risk management in the companies mentioned in this *article this problem area is very acute and highly necessary.* Its solution will bring a significant benefit in the area of increasing the performance efficiency and competitiveness of the enterprises in the framework of the dynamic changes of the external and internal environment. The knowledge of the key risks and implementation of the risk management in the companies is also an opportunity to increase the performance efficiency or to achieve costs savings. Investments in prevention will bring savings of the financial costs compared with the expenses for solving the subsequences of the negative events. Therefore, it is necessary to improve the awareness and to inform the managers about managing risks in the enterprises worldwide, and in Slovakia as well (Sira *et al.*, 2016; Hudáková *et al.*, 2017). It is important for company managers to be able to identify the most serious risks, to create a space for discussions and to implement the whole risk management system in the companies with an emphasis on preventing the company crises (Brachert *et al.*, 2017).

The aim of this article is to assess the sources of the market, economic, financial, operational, HR, security and legal risk in dependence on the rate of implementing the risk management process in the SMEs.

Empirical research was realized through questionnaire at base 487 of managers in the business environment of Slovakia. The data set was collected in the year 2018. The statistical hypotheses were verified using Chi-square tests and Z-score.

The paper is structured as follows. Section 2 briefly introduces the risk management process, the importance managers of companies. Section 3 introduces literature review of the key risks and their sources in business environment. Section 4 describes the empirical background, i.e. aim of the article, methodology of data collection, formulate statistical hypotheses and methods. Section 5 presents and discusses the main and important empirical results. Section 6 compares the findings of the paper with the findings of other authors. Section 7 proposes a new methodology (nine steps) of management risk process. In the concussion, the limits of research and the future research of authors are presented.

Literature review

An integrated approach to risk management across all company departments (processes) is becoming a global trend in the area of the risk management implementation (Fraser & Simkins, 2016; Gates *et al.*, 2012). It increases the successfulness of the risk management in the enterprise, the

number of correct decisions, but it also increases the probability of achieving the company goals. The research results of various global organisations, e.g. the US institution ERM (Enterprise Risk Management) Initiative NC in collaboration with the Chartered Global Management Accountant publish a report about the global situation and control of the risk management from the point of view of the trends and opportunities for improvements (Enterprise risk management initiative, 2017). The report of the Global State of Enterprise Risk Oversight declares the results about the current state of implementing the risk management in the SMEs globally. The results confirm an increased interest in the risk management in the SMEs and a positive perception of the risk management as a way of influencing the strategic success of the enterprise. The companies worldwide face similar risks, however, the perception of the risk on individual continents is different, e.g. (*Global Management Accountant – Global State of Enterprise Risk Oversight*, 2017; *Enterprise risk management initiative*, 2017):

− Approximately one-third of the companies in Europe, Asia, Australia, Africa and the Middle East believe their company risk management is implemented appropriately, compared to America with 24%.
− Approximately 60% of the companies in Europe, Asia, Australia, Africa and the Middle East are able to describe their company risk management from the point of view of the process, compared to America with only 29%.
− Less than 30% of the enterprises worldwide think they will acquire a competitive advantage through implementing the risk management process.
− In 70% of the companies in Europe, Asia, Australia, Africa and the Middle East the top management has the duty to check the risks, compared to America with only 46%.
− Only 20% of the enterprises have implemented the integrated approach to the company risk management.
− 80% of the companies do not invest in training of their managers in the area of the risk management.

Another global trend in the area of the risk management (Global risk management survey, 2018) is the fact that the companies centralise the tasks and processes of the risk management into one department and create special teams of managers from individual departments whose goal is to manage the risks. The research of The American Institute of CPAs shows the companies consider the centralised departments and the main risk managers to be a value added for the strategic decisions (The American Institute of CPAs, 2017).

In spite of the fact that the interest of the companies in implementing the risk management increases and the benefit of the risk management is visible, there are still shortages in introducing the risk management processes. This can be proved by the results of international studies, e.g. Report on the Current State of Enterprise Risk Oversight: Update on Trends and Opportunities (2015) worked out by the US institution ERM (Enterprise Risk Management) Initiative NC, in collaboration with the American institution CPAs (Certified Public Accountants). The key findings of this study are as follows (*Enterprise risk management initiative*, 2017; *Global risk management survey*, 2018). The state of the company risk management:

− 59% of the companies think the extent and complicatedness of the risks have changed significantly during last five years. This is valid for companies of all sizes and types.
− Only 25% of the companies believe they have implemented the risk management system. This result does not differ from the last year result, and it indicates that no significant changes regarding the system functionality were realised.
− Only 23% of the enterprise say their risk management implementation is effective and at a sufficient level.
− 58% of the companies claim the risk management process is not considered a strategic tool which provides any competitive advantage.
− 45% of the enterprises have created a special management team that deals with the risk management in the whole company and meets once per quarter.
− 42% of the companies believe that the implementation of the risk management is an important competitive tool in further progress of the enterprise.
− 42% of the companies believe there are not sufficient resources of the enterprise determined for the company risk management system.
− 60% of the companies do not provide any training and consultancy in the risk management area.

Other global investigations realised e.g. by the FERMA organisation (European Risk and Insurance Report) confirm that, in spite of the fact the company risk management is not a new discipline, the current risk management models are not flexible enough to take into account the dynamics of the market (FERMA, 2017). The barriers that hamper the companies to manage the risks effectively concern the problems of the information availability necessary for assessing and managing the risks. They are missing support in the process of the early risk identification and the company top management do not provide sufficient training or consultancy in the area of the risk management.

There are various institutions for supporting the implementation of the risk management in practice in many countries. Their objective is to disseminate the information about the risk management and to improve the risk management's position in the enterprises, to provide support during educational and research projects, to support the position of the risk manager and to enforce this position in the companies. The most important organisation of this kind is the Federation of European Risk Management Associations — FERMA with the seat in Brussels. FERMA associates 20 European countries; however, Slovakia has not entered this organisation yet. Other institutions are, e.g. Institute of Risk Management (IRM), Enterprise Risk Management Academy, Enterprise Risk Management Imitative NC State University, The Risk Management Association, Philadelphia, etc. (FERMA, 2017).

Based on the information acquired from the global investigations, we can say the situation in the field of the risk management implementation in the area of Eastern Europe, in the Czech Republic and Slovakia, is not positive.

According to several authors, dealing with this area the companies are missing an overall framework of the risk management which is not sufficiently linked and works without any connection with the company strategy. It faces problems of defining the contents, taking responsibilities for the risks, and the stating of the criteria are also missing — i.e. the tolerance of the risk, the insufficient orientation on identifying the root causes of the risks, etc. The financial crisis of 2008–2009 aroused great interest in the risk management in the Slovak enterprises, and strengthened the position and tasks of managing the risks by the financial managers, however, not to such an extent as in other European countries (Hudáková & Lusková, 2016).

The companies in the Czech Republic and Slovakia neither recognise exactly the risks and opportunities of the processes nor their real target key risk indicators. According to several experts who are dealing with this area (Hudáková *et al*., 2017; Havko *et al*., 2016; Sira *et al*., 2016; Cepel *et al*., 2018), the managers implement a dangerous tendency of an exaggerated confidence that all problems, when they appear, will be solved on time and without any big losses. In some enterprises, the risk management is only part of emergencies and unexpected events. A possible reason for this can be the fact the companies utilise the risk management too late, at the moment when the problems arise and then they solve the consequences and not the prevention. This situation is caused especially by the approach of the managers to the risks, underestimating the company risks, missing knowledge and practical experience with implementing the risk manage-

ment process. We can find various methodological procedures for assessing and managing the risks for the key company areas e.g. for hazardous operations or the financial risk management, etc. in Slovakia (Hudáková *et al.*, 2017). However, the managers are missing practical instructions on how to implement the risk management process effectively. As it has been already mentioned, there is no organisation or association which would directly help the companies with implementing the risk management in Slovakia. In Slovakia, we have recently not realised any research which would cover the whole country and provide relevant data about the current state of the risk management in the enterprises.

Research methodology

The objective of this article is to identify the most serious risks and their sources based on the realised research in the SMEs in Slovakia. To analyse and evaluate the risks based on the criteria "level of the risk management in the company" and "the level of providing space for discussions about the key company risks" using selected methods and tools of the mathematical statistics. The processed results will show the importance and needs of the managers to identify the most serious risks and to implement the risk management process in the SMEs with an emphasis on the company crises.

The authors consider the market (Zimon, 2017; Kristoufek, 2018), economic (Carr *et al.*, 2017), financial (Ključnikov *et al.*, 2017), operational (McNulty & Akhigbe, 2017), personnel (Kozlova *et al.*, 2016), security (Mayadunne & Park, 2016) and legal risks (Li & Moosa, 2015; Jones & Lubinski, 2012) to be the most important risks which negatively affect the entrepreneurial environment. The authors think there are differences between entrepreneurs in perceiving the intensity of the selected risk sources.

The authors selected research criteria (K):
− *K1:* our company deals with the risk management — yes (K11), no (K12);
− *K2:* our company creates a space for discussing the key risks — yes (K21), no (K22).

The research criterion K1 was created for detecting the implementation state of the risk management in the company. The research criterion K2 was created for detecting whether the company provides any space for discussing the key risks.

The entrepreneurs could give their opinion to the risk sources which affect the company intensively — a very low intensity of the risk source (V1 — Likert scale); a low intensity of the risk source (V2); a medium intensity

of the risk source (V3); a high intensity of the risk source (V4) and a very high intensity of the risk source (V5). The sources (causes) of the selected risks are for:

− *The market risk (R1):* losing the customers (11); strong competition in the line of business (R12); stagnation of the market (R13); unreliability of the suppliers (R14);
− *The economic risk (R2):* development of the tax and insurance burden (R21); weak availability of the financial resources (loans, foundations) (R22), development of the interest rates (R23); growing prices of all types of energy (R24);
− *The financial risk (R3):* insufficient company profit (R31); indebtedness of the company (high share of the foreign capital) (R32); unpaid receivables (R33); inability to pay obligations (insolvency) (R34);
− *The operational risks (R4):* insufficient utilisation of the production capacities (R41); obsolete production facilities (R42); low rate of innovations (R43); increasing amount of claims (R44);
− *The HR risks (R5):* high fluctuation rate of the employees (R51); insufficient qualification of the employees (R52); errors of the employees (industrial injuries) (R53); decrease of the working morale and discipline (R54);
− *The safety risks (R6):* accidents and external threats (floods, fire, ...) (R61); misusing information (R62); low protection (occupational health and safety at work) (R63); criminal offences against property laws (R64);
− *The legal risks (R7):* low enforcement of the law (R71); frequent changes of the legal regulations (R72); low independence of the courts (R73); a long time period until the lawsuit is solved (R74).

To fulfill the main task of the article, we formulated the following statistical hypotheses:

H1_A: *The unreliability of the suppliers is the most important source of the market risk. H1_B: There are statistically significant differences in evaluating the market risk sources between selected groups of entrepreneurs according to the criteria.*

H2_A: *The development of the interest rates is the most important source of the economic risk. H2_B: There are statistically significant differences in evaluating the economic risk sources between selected groups of entrepreneurs according to the criteria.*

H3_A: *The insufficient company profit is the most important source of the financial risk. H3_B: There are statistically significant differences in evaluating the financial risk sources between selected groups of entrepreneurs according to the criteria.*

H4_A: *The low rate of innovations is the most important source of the operational risk. H4_B: There are statistically significant differences in evaluating the operational risk sources between selected groups of entrepreneurs according to the criteria.*

H5_A: *The insufficient qualification of the employees is the most important source of the HR risk. H5_B: There are statistically significant differences in evaluating the HR risk sources between selected groups of entrepreneurs according to the criteria.*

H6_A: *The criminal offences against property laws is the most important source of the safety risk. H6_B: There are statistically significant differences in evaluating the safety risk sources between selected groups of entrepreneurs according to the criteria.*

H7_A: *The low enforcement of the law is the most important source of the legal risk. H7_B: There are statistically significant differences in evaluating the legal risk sources between selected groups of entrepreneurs according to the criteria.*

Through the method of random selection (using the mathematical function "Randbetween"), we chose 1,500 companies from the CRIBIS database (database of companies, organisations, and self-employed persons) of the Slovak Republic. In the framework of the VEGA project, we addressed SMEs through an e-mail. Subsequently, the entrepreneurs were contacted by phone and asked to fill in a questionnaire. The questionnaire was created and made available to the respondents in an electronic form to the following line: https://docs.google.com/forms/d/e/1FAIpQLScj2PF20p0a522vR ww20Tya_6JMx71nHF8lj4-fBVH4M87FuA/viewform?usp=sf_link. The questionnaire included 26 questions aimed at evaluating the selected risks and their sources by the entrepreneurs. The questions were to be considered to be of key importance. The data collection was carried out from September 2017 to January 2018. The successfulness reached the level of 32.4% (487/1,500). Altogether 13 questions (50% of the questionnaire) were assessed for creating this article.

To fulfill the main goal of this article and to evaluate the statistical hypotheses in the first step we utilised the tools of the descriptive statistics (tables, description characteristics — absolute and relative frequency). Descriptive characteristics are needed to calculate Z-score. To determine the descriptive statistics of the selected risk sources according to the selected criteria we utilized the simple classification method (Belas *et al*., 2018), the classification method according to the statistical signs. During assessing the basic respondent structure, we aimed at the relative frequency. Another utilised method was the dependence between the qualitatively possible statistical signs (contingency table, contingency intensity). The intensity of contingency was measured by using the Pearson´s Contingency Coefficient — its basis is the quadratic contingency. The Pearson´s Contingency Coefficient (p-value) achieves the value of 0 when both signs are independent (Mirkin, 2001; Tsai *et al*., 2008). When the dependence is complete, it is close to 1 (Lancaster & Hamdan, 1964). The aforementioned Pearson´s Contingency Coefficient was utilised for making decisions about the statistical significance of the respondents according to the criterion selected. The boundary between accepting and rejecting the statistical hypothesis was stated by the level of significance a p-value of 0.05 (Godfrey, 2005). When the calculated p-value was lower than the level of significance 0.05, then the structure of the entrepreneurs´ evaluations was significant. For assessing the Z-score parameters we utilised the p-value of the standardised normal classification (Balcaen & Ooghe, 2006; Altman *et al*., 2017). The conditions for realising the Z-test (normal distribution of the statistical sign and a large extent of the selection file) were fulfilled. The calculations were carried out by the freely available software SPSS Statistics (Lazányi *et al*., 2017).

The entrepreneurs from the Slovak business environment were chosen on the basis of demographic characteristics (gender, age, education) and the companies on the basis of selected criteria (region, number of employees, a line of business, how many years they have been doing business).

The structure of the entrepreneurs´ characteristics who filled in the questionnaire was as follows: male businessmen — 325 (66.8%); female entrepreneurs — 162 (33.2%); the age up to 30 years — 99 (20.3%); from 31 to 50 years — 269 (55.2%); over 50 years — 119 (24.5%); the achieved education — secondary school without the school-leaving exam — 58 (11.9%); secondary school with the school-leaving exam — 257 (52.8%); university graduates — 172 (35.3%).

The selected characteristics of the companies:
− the region where the entrepreneur is doing business: the Žilina region — 315 (64.7%); another region in Slovakia — 142 (35.3%);
− the number of employees: a micro-company (to 10 employees) — 315 (64.5%); a small company (to 50 employees) — 115 (23.6%); a medium-sized company (to 250 employees) — 58 (11.9%);
− the line of business: trade — 118 (24.2%); services — 86 (17.7%); industry — 72 (14.8%), building industry — 59 (12.1%), catering — lodging 42 (8.6%), transport — providing information — 31 (6.4%) and lines of business — 79 (16.2%);
− how long the entrepreneurs have been doing business: more than 10 years — 250 (51.3%), from 5 to 10 years — 126 (25.9%), from 1 to 5 years — 93 (19.1%) and shorter than 1 year — 18 (3.7%).

Results

The entrepreneurs were to choose three key risks they consider to be the key ones for their business. The following figure (see Fig. 1) shows the absolute frequency of entrepreneurs who chose one risk as one of three key risks.

The achieved results (see Fig. 1) of the empirical research for determining the importance of the significance for the SMEs (beginning with the most important risk): the market risk 69.8% (340/487 — the total number of respondents), the financial risk 58.1% (283/487), the economic risk 53.0% (258/487), the HR risk 30.6% (149/487), the operational risk 25.1% (122/487), the legal risk 20% (97/487) and the security and safety risk 16.1% (78/487).

The criteria assessment by the entrepreneurs: K1 — our company deals with the risk management: yes — (K11) 254 businessmen (52.2%), no (K12) 233 businessmen (47.8); K2 — our company creates a space for discussing the key risks — yes (K21) 274 businessmen (56.3%), no (K22) 213 businessmen (43.7%).

The following tables 1, 2, 3, 4, 5, 6 and 7 summarize the results of the analysis´ and the assessment of the key risks´ sources (the market, economic, financial, operational, HR, security and safety and legal ones) according to the selected criteria. The authors consider it important to investigate the differences in the values of the risk sources — the answers bring a high intensity of the risk source (V4) and a very high intensity of the risk source (V5).

The most significant source of the market risk (see Table 1) is strong competition in the line of business (the answers V4 + V5) (233 entrepreneurs).

The next items of the market risk source are: losing the customers (228); unreliability of the suppliers (94) and stagnation of the market (91). We reject the hypothesis H1_A. There are no statistically significant differences in evaluating the market risk sources according to the criteria (company deals with the risk management and creates a space for discussing the key risks) (see also Table 8_R1). We reject the hypothesis H1_B.

The most significant source of the economic risk (see Table 2) is development of the tax and insurance burden (the answers V4 + V5) (232 entrepreneurs). The next items of the economic risk source are: growing prices of all types of energy (183); weak availability of the financial resources (loans, foundations) (106) and development of the interest rates (95). We reject the hypothesis H2_A. There are no statistically significant differences in evaluating the economic risk sources according to the criteria (company deals with the risk management and creates a space for discussing the key risks) (see also Table 8_R2). We reject the hypothesis H2_B.

The most significant source of the financial risk (see Table 3) is insufficient company profit (the answers V4 + V5) (162 entrepreneurs). The next items of the financial risk source are: unpaid receivables (122); inability to pay obligations (insolvency) (89) and indebtedness of the company (high share of the foreign capital) (78). We accept the hypothesis H3_A. There are statistically significant differences in evaluating the unpaid receivables according to the criteria (company deals with the risk management and creates a space for discussing the key risks) (see also Table 8_R3). We partially accept the hypothesis H3_B.

The most significant source of operational risk (see Table 4) is low rate of innovations (the answers V4 + V5) (64 entrepreneurs). The next items of the operational risk source are: obsolete production facilities (57); increasing amount of claims (55) and insufficient utilization of the production capacities (41). We accept the hypothesis H4_A. There are no statistically significant differences in evaluating the operational risk sources according to the criteria (company deals with the risk management and creates a space for discussing the key risks) (see also Table 8_R4). We reject the hypothesis H4_B.

The most significant source of the HR risk (see Table 5) is insufficient qualification of the employees (the answers V4 + V5) (102 entrepreneurs). The next items of the HR risk source are: high fluctuation rate of the employees (99); decrease of the working morale and discipline (81) and errors of the employees (industrial injuries) (65). We accept the hypothesis H5_A.

There are no statistically significant differences in evaluating the HR risk sources according to the criteria (company deals with the risk management and creates a space for discussing the key risks) (see also Table 8_R5). We reject the hypothesis H5_B.

The most significant source of the safety risk (see table 6) is misusing information (the answers V4 + V5) (70 entrepreneurs). The next items of the safety risk source are: criminal offences against property laws (68); accidents and external threats (floods, fire, ...) (61) and low protection (occupation-al health and safety at work) (50). We reject the hypothesis H6_A. There are statistically significant differences in evaluating the misusing information according to the criteria (company deals with the risk management and creates a space for discussing the key risks) (see also Table 8_R6). We partially accept the hypothesis H6_B.

The most significant source of the legal risk (see Table 7) is a long time period until the lawsuit is solved (the answers V4 + V5) (191 entrepreneurs). The next items of the legal risk source are: frequent changes of the legal regulations (153); low enforcement of the law (141) and low independence of the courts (129). We reject the hypothesis H7_A. There are statistically significant differences in evaluating the low enforcement of the law and a long time period until the lawsuit is solved according to the criteria (company deals with the risk management and creates a space for discussing the key risks) (see also Table 8_R7). We partially accept the hypothesis H2_B.

The following table (see table 8) summarizes the overall results of the tests comparing the evaluations of the company managers who denoted very high or high intensity of performing the source of the key risk (R1, ..., R7).

Discussion

The results of the empirical research showed that the market, financial, and economic risks are three most important risks that negatively perform in SMEs´ business environment. The most significant source of the market risk is the strong competition in the line of business where the company works. The unpaid receivables are the most significant source for the financial risk. The development of the tax and insurance burden is the most significant source for the financial risk. The strongest dependence the SME entrepreneurs perceive was found between the development of the tax and insurance burden as a source of the economic risk and the criterion the "levels of the risk management in the company". Further dependences were

detected also in connection with another criterion assessed, i.e. the space in the company for discussing the key risks — the same source of the economic risk. The results also show discrepancies for the source of the legal risk: the low enforcement of law and a long time period of solving the lawsuits. The company managers whose companies implemented the risk management process perceive these aforementioned sources more intensively.

Further results of the realised research show that 52.2% of all addressed companies are currently trying to implement the risk management process. These results are in contradiction with the global results of investigations (*Global Management Accountant — Global State of Enterprise Risk Oversight*, 2017; *Enterprise risk management initiative*, 2017) which say that only 25 % of the companies have implemented the risk management. 56.3% of the SME managers say they create a space for discussing the key risks in the companies. The results of our research are two-times higher than the results of the investigation (*Global Management Accountant — Global State of Enterprise Risk Oversight,* 2017; *Enterprise risk management initiative*, 2017) — they say that only 27% of companies provide time and create a space for discussing the key risks at regular meetings. The possible explanation of these results may lie in the fact that the managers or owners of the SMEs in Slovakia consider the risk management to be already the management of the market and financial risks. However, the companies abroad consider the implementation of the risk management process to be only the complex management of all the key risks in the enterprise. Another reason can be the missing knowledge and real practical experience of the managers in implementing the risk management process. This leads to a situation the SME managers in Slovakia incline not to admit a negative situation than to prepare for it and they delude that their company is working according to the stated rules.

Application

Based on the obtained results, the authors propose the following methodology, which is formed by the risk management standard ISO 31000:2009 Risk Management — Principles and guidelines which provides only a general and universal character. The proposed application of the risk management methodology in the Slovak enterprises provides more specific guidance for the implementation of the risk management in the enterprises. The methodology consists of the following nine steps (Hudáková *et al*., 2017):

1. *Establish strategy, policies, and responsibility for the risk management.* The prerequisite for an implementing the enterprise risk management is

to have sufficient support from the top management. It is very important that the management of the enterprises are interested in prevention. The enterprise strategy has to be clear even before the implementation of the enterprise risk management.

2. *Analyze the environment and establish risk criteria.* It is necessary to elaborate on the analysis of the internal and external business environment so that the managers can define strategic and organizational connections with the risk management. The managers should define risk criteria (e.g. determine risk capacity and risk appetite).

3. *Identify risks and risk resources.* It is necessary to identify the risks and risk resources. The risks should be recognized and described. The managers should ensure regular monitoring of all ongoing external and internal events affecting the achievement of objectives. It is necessary to distinguish the positive impact (opportunities) or negative effects (threats).

4. *Risk analysis*. It is necessary to elaborate on the analysis of the identified risks based on the probability of the occurrence together with the impact. The conjunction of the probability of the occurrence and the impact form the risk level which determines the risk priority i.e. to which extent risks may affect the aims of the company.

5. *Risk assessment and establishing risk catalogue.* It is necessary to compare the probability of occurrence and the consequences with defined criteria mentioned in the second step. The responsible managers should decide what the priorities are for dealing with the risks and which actions should be carried out.

6. *Develop and implement a plan for preventive measures.* It is necessary to propose preventive measures to the reduce risks. This is to ensure unacceptable risks by the intended tactics. The acceptable risk should be monitored, because of the eventual future changes in the level of the identified risks.

7. *Evaluate the effectiveness of the preventive measures and risk management.* It is necessary to make a review of the whole risk management process. It should be provided with communication, advice, and reporting. The managers should ensure the control of the identified risks and the proposed measures from the perspective of continuous improvement.

8. *Ensure monitoring of risks.* The next step in the application of the enterprise risk management is providing an early warning system for continuous monitoring of key processes in the enterprise.

9. *Take a positive attitude to risks.* The final step in the application of the enterprise risk management is that top management will create values

within a business culture that will lead the managers to a positive attitude to the risk and the prevention in the enterprise.

The appropriate risk management is a continuous and never-ending enterprise activity. All above-introduced steps of the risk management could be modified during the time because of the external and internal environmental changes. The approach to the enterprise risk management has to be systematic. The methodology can be used for different types of businesses and it assumes rational application and adaptation of the risk management to specific conditions in the enterprises.

Conclusions

The most important (key) risks are: the market risk (68.9%), the financial risk (58.1%) and the economic risk (53%). The structure of managers´ answers is statistically significant for all sources of the market, economic, financial, operational, HR, safety and legal risk. The research criteria (company deals with the risk management and creates a space for discussing the key risks) have an influence on evaluating of sources of the financial, safety and legal risk.

The effort of the authors is to make gradual steps to enforce the implementation of the risk management process in the Slovak enterprises for the managers to be able to manage the risks and for them to get closer to the global trends. The results achieved will be compared with similar investigations on the international level, e.g. with the universities in the Czech Republic, Finland, Poland, Serbia and other international organisations, e.g. ISO/TC 262.

Despite of our awareness of the certain limits to our research (e. g. regional character of the study, only two statistical methods as Chi-square test and Z-score), we believe that our article has brought several interesting findings and new incentives for the further research and discussion regarding assessing the selected risks in the SMEs, their sources and possibilities for the improvement the risk management process.

It is worth to concentrate our future research on the comparison of evaluation of the risks and their sources with other countries the Visegrad groups. The authors would like to cooperate with researchers these countries because the authors believe that the risks and their sources differently influencing the quality of the business environment in this countries.

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Acknowledgements

Annex

Table 1. The evaluation of sources of market risk by entrepreneurs

R11	K11	K12	K21	K22	R12	K11	K12	K21	K22
V1	27	26	28	25	V1	16	8	15	9
V2	42	47	45	44	V2	28	39	34	33
V3	71	56	76	51	V3	86	77	95	68
V4	64	56	68	52	V4	96	67	98	65
V5	50	48	57	41	V5	28	42	32	38
V4+V5	114	104	125	93	V4+V5	124	109	130	103
[%]	44.9	44.6	45.6	43.7	[%]	48.8	46.8	47.4	48.4
Sum	254	233	274	213	Sum	254	233	274	213
Chi-square	1.743		2.242		Chi-square	12.046		5.630	
P- value	0.782		0.691		P- value	0.017		0.228	
R13	K11	K12	K21	K22	R14	K11	K12	K21	K22
V1	35	33	37	31	V1	66	61	74	53
V2	58	52	64	46	V2	80	79	88	71
V3	111	107	124	94	V3	58	49	60	47
V4	33	28	30	31	V4	37	33	38	32
V5	17	13	19	11	V5	13	11	14	10
V4+V5	50	41	49	42	V4+V5	50	44	52	42
[%]	19.7	17.6	17.9	19.7	[%]	19.7	18.8	19.0	19.7
Sum	254	233	274	213	Sum	254	233	274	213
Chi-square	0.498		2.146		Chi-square	0.451		0.416	
P- value	0.973		0.708		P- value	0.978		0.981	

Notes: R11, R12, R13, R14 – sources of market risk, V1, V2, V3, V4, V5 – evaluation of source of risk, K11, K12, K13, K14 – criteria.

Table 2. The evaluation of sources of economic risk by entrepreneurs

R21	K11	K12	K21	K22	R22	K11	K12	K21	K22
V1	7	25	10	22	V1	37	31	42	26
V2	36	36	44	28	V2	80	62	84	58
V3	85	66	92	59	V3	87	84	89	82
V4	75	55	88	42	V4	28	40	36	32
V5	51	51	40	62	V5	22	16	23	15
V4+V5	126	106	128	104	V4+V5	50	56	59	47
[%]	49.6	45.5	46.7	48.8	[%]	19.7	24.0	21.5	22.1
Sum	254	233	274	213	Sum	254	233	274	213
Chi-square	14.714		29.105		Chi-square	5.032		3.139	
P- value	0.005		<0.001		P- value	0.284		0.535	
R23	K11	K12	K21	K22	R24	K11	K12	K21	K22
V1	44	38	44	38	V1	21	19	19	21
V2	85	74	88	71	V2	51	50	56	45
V3	74	77	90	61	V3	81	82	91	72
V4	41	34	41	34	V4	76	56	85	47

Table 2. Continued

R23	K11	K12	K21	K22	R24	K11	K12	K21	K22
V5	10	10	11	9	V5	25	26	23	28
V4+V5	51	44	52	43	V4+V5	101	82	108	75
[%]	20.1	18.9	19.0	20.2	[%]	39.8	35.1	39.4	35.2
Sum	254	233	274	213	Sum	254	233	274	213
Chi-square	1.010		1.055		Chi-square	2.264		7.418	
P- value	0.908		0.901		P- value	0.687		0.115	

Notes: R21, R22, R23, R24 – sources of economic risk, V1, V2, V3, V4, V5 – evaluation of source of risk, K11, K12, K13, K14 – criteria.

Table 3. The evaluation of sources of financial risk by entrepreneurs

R31	K11	K12	K21	K22	R32	K11	K12	K21	K22
V1	35	21	35	21	V1	83	77	88	72
V2	58	57	64	51	V2	84	67	81	70
V3	83	71	90	64	V3	50	48	56	42
V4	54	54	57	51	V4	24	32	31	25
V5	24	30	28	26	V5	13	9	18	4
V4+V5	78	84	85	77	V4+V5	37	41	49	29
[%]	30.7	36.1	31.0	36.2	[%]	14.6	17.6	17.9	13.6
Sum	254	233	274	213	Sum	254	233	274	213
Chi-square	4.212		2.159		Chi-square	3.150		6.413	
P- value	0.378		0.706		P- value	0.533		0.170	
R33	**K11**	**K12**	**K21**	**K22**	**R34**	**K11**	**K12**	**K21**	**K22**
V1	77	72	79	70	V1	99	80	100	79
V2	54	59	61	52	V2	56	66	59	63
V3	52	51	51	52	V3	48	49	57	40
V4	41	34	47	28	V4	27	20	26	21
V5	30	17	36	11	V5	24	18	32	10
V4+V5	71	51	83	39	V4+V5	51	38	58	31
[%]	28.0	21.9	30.3	18.3	[%]	20.1	16.3	21.2	14.6
Sum	254	233	274	213	Sum	254	233	274	213
Chi-square	3.749		11.928		Chi-square	3.848		10.148	
P- value	0.441		0.018		P- value	0.427		0.037	

Notes: R31, R32, R33, R34 – sources of financial risk, V1, V2, V3, V4, V5 – evaluation of source of risk, K11, K12, K13, K14 – criteria.

Table 4. The evaluation of sources of operational risk by entrepreneurs

R41	K11	K12	K21	K22	R42	K11	K12	K21	K22
V1	78	75	81	72	V1	82	93	93	82
V2	92	79	106	65	V2	72	58	70	60
V3	64	58	67	55	V3	71	54	74	51
V4	16	18	16	18	V4	19	22	24	17
V5	4	3	4	3	V5	10	6	13	3
V4+V5	20	21	20	21	V4+V5	29	28	37	20
[%]	7.9	9.0	7.3	9.9	[%]	11.4	12.0	13.5	9.4

Table 4. Continued

R41	K11	K12	K21	K22	R42	K11	K12	K21	K22
Sum	254	233	274	213	Sum	254	233	274	213
Chi-square	0.698		4.226		Chi-square	4.834		5.585	
P- value	0.951		0.376		P- value	0.308		0.232	
R43	**K11**	**K12**	**K21**	**K22**	**R44**	**K11**	**K12**	**K21**	**K22**
V1	67	71	74	64	V1	108	104	115	97
V2	79	71	80	70	V2	61	58	66	53
V3	78	57	80	55	V3	56	45	58	43
V4	23	25	30	18	V4	19	20	23	16
V5	7	9	10	6	V5	10	6	12	4
V4+V5	30	34	40	24	V4+V5	29	26	35	20
[%]	11.8	14.6	14.6	11.3	[%]	11.4	11.2	12.8	9.4
Sum	254	233	274	213	Sum	254	233	274	213
Chi-square	3.243		2.418		Chi-square	1.472		2.836	
P- value	0.518		0.659		P- value	0.832		0.585	

Notes: R31, R32, R33, R34 – sources of operational risk, V1, V2, V3, V4, V5 – evaluation of source of risk, K11, K12, K13, K14 – criteria.

Table 5. The evaluation of sources of HR risk by entrepreneurs

R51	K11	K12	K21	K22	R52	K11	K12	K21	K22
V1	71	81	76	76	V1	57	69	61	65
V2	60	57	66	51	V2	74	69	75	68
V3	67	52	68	51	V3	64	52	71	45
V4	43	31	47	27	V4	38	30	41	27
V5	13	12	17	8	V5	21	13	26	8
V4+V5	56	43	64	35	V4+V5	59	43	67	35
[%]	22.0	18.5	23.4	16.4	[%]	23.2	18.5	24.5	16.4
Sum	254	233	274	213	Sum	254	233	274	213
Chi-square	3.713		5.441		Chi-square	4.485		11.245	
P- value	0.446		0.245		P- value	0.344		0.024	
R53	**K11**	**K12**	**K21**	**K22**	**R54**	**K11**	**K12**	**K21**	**K22**
V1	76	80	85	71	V1	80	83	86	77
V2	83	71	86	68	V2	73	66	78	61
V3	62	50	61	51	V3	61	43	60	44
V4	23	24	29	18	V4	28	32	35	25
V5	10	8	13	5	V5	12	9	15	6
V4+V5	33	32	42	23	V4+V5	40	41	50	31
[%]	13.0	13.7	15.3	10.8	[%]	15.7	17.6	18.2	14.6
Sum	254	233	274	213	Sum	254	233	274	213
Chi-square	1.664		2.786		Chi-square	3.319		2.967	
P- value	0.797		0.594		P- value	0.506		0.563	

Notes: R31, R32, R33, R34 – sources of HR risk, V1, V2, V3, V4, V5 – evaluation of source of risk, K11, K12, K13, K14 – criteria.

Table 6. The evaluation of sources of safety risk by entrepreneurs

R61	K11	K12	K21	K22	R62	K11	K12	K21	K22
V1	88	88	99	77	V1	77	92	77	92
V2	66	65	64	67	V2	77	74	85	66
V3	63	56	71	48	V3	55	42	59	38
V4	21	9	20	10	V4	34	17	39	12
V5	16	15	20	11	V5	11	8	14	5
V4+V5	37	24	40	21	V4+V5	45	25	53	17
[%]	14.6	10.3	14.6	9.9	[%]	17.7	10.7	19.3	8.0
Sum	254	233	274	213	Sum	254	233	274	213
Chi-square	4.354		5.658		Chi-square	9.884		19.491	
P- value	0.360		0.226		P- value	0.047		<0.001	
R63	K11	K12	K21	K22	R64	K11	K12	K21	K22
V1	112	88	114	86	V1	104	97	113	88
V2	75	79	82	72	V2	64	58	63	59
V3	46	37	50	33	V3	48	48	53	43
V4	15	23	22	16	V4	26	22	30	18
V5	6	6	6	6	V5	12	8	15	5
V4+V5	21	29	28	22	V4+V5	38	30	45	23
[%]	8.3	12.4	10.2	10.3	[%]	15.0	12.9	16.4	10.8
Sum	254	233	274	213	Sum	254	233	274	213
Chi-square	4.747		1.379		Chi-square	0.768		4.715	
P- value	0.314		0.847		P- value	0.943		0.317	

Notes: R31, R32, R33, R34 – sources of safety risk, V1, V2, V3, V4, V5 – evaluation of source of risk, K11, K12, K13, K14 – criteria.

Table 7. The evaluation of sources of legal risk by entrepreneurs

R71	K11	K12	K21	K22	R72	K11	K12	K21	K22
V1	45	52	52	45	V1	37	41	45	33
V2	56	73	55	74	V2	50	64	53	61
V3	65	55	72	48	V3	79	63	89	53
V4	46	33	53	26	V4	43	42	48	37
V5	42	20	42	20	V5	45	23	39	29
V4+V5	88	53	95	46	V4+V5	88	65	87	66
[%]	34.6	22.7	34.7	21.6	[%]	34.6	27.9	31.8	31.0
Sum	254	233	274	213	Sum	254	233	274	213
Chi-square	12.642		17.776		Chi-square	9.969		6.896	
P- value	0.0131		0.001		P- value	0.0409		0.141	
R73	K11	K12	K21	K22	R74	K11	K12	K21	K22
V1	57	58	65	50	V1	52	64	60	56
V2	51	67	56	62	V2	34	48	38	44
V3	68	57	75	50	V3	55	43	58	40
V4	46	35	46	35	V4	57	49	67	39
V5	32	16	32	16	V5	56	29	51	34

Table 7. Continued

R73	K11	K12	K21	K22	R74	K11	K12	K21	K22
V4+V5	78	51	78	51	V4+V5	113	78	118	73
[%]	30.7	21.9	28.5	23.9	[%]	44.5	33.5	43.1	34.3
Sum	254	233	274	213	Sum	254	233	274	213
Chi-square	9.485		6.550		Chi-square	13.400		7.151	
P- value	0.049		0.162		P- value	0.009		0.128	

Notes: R31, R32, R33, R34 – sources of legal risk, V1, V2, V3, V4, V5 – evaluation of source of risk, K11, K12, K13, K14 – criteria.

Table 8. Comparison of risk assessment by selected criteria

	K1	K2		K1	K2		K1	K2
Table 8_R1	Z-score	Z-score	**Table 8_R2**	Z-score	Z-score	**Table 8_R3**	Z-score	Z-score
	P-value	P-value		P-value	P-value		P-value	P-value
R11	0.055	0.431	R21	0.908	-0.462	R31	-1.250	-1.191
	0.960	0.667		0.362	0.645		0.211	0.234
R12	0.449	-0.199	R22	-1.162	-0.141	R32	-0.911	1.274
	0.652	0.841		0.246	0.888		0.363	0.204
R13	0.591	-0.515	R23	0.332	-0.332	R33	1.542	3.027
	0.555	0.603		0.741	0.741		0.123	0.002
R14	0.223	-0.205	R24	1.040	0.950	R34	1.075	1.873
	0.826	0.834		0.298	0.342		0.280	0.061
	K1	K2		K1	K2		K1	K2
Table 8_R4	Z-score	Z-score	**Table 8_R5**	Z-score	Z-score	**Table 8_R6**	Z-score	Z-score
	P-value	P-value		P-value	P-value		P-value	P-value
R41	-0.452	-1.001	R51	0.984	1.889	R61	1.421	1.567
	0.653	0.312		0.327	0.049		0.155	0.116
R42	-0.205	1.401	R52	1.293	2.158	R62	2.195	3.545
	0.833	0.161		0.197	0.031		0.028	< 0.001
R43	-0.907	1.079	R53	-0.240	1.458	R63	-1.517	-0.039
	0.362	0.281		0.810	0.144		0.128	0.968
R44	0.09	1.170	R54	-0.547	1.086	R64	0.663	1.776
	0.928	0.242		0.582	0.276		0.509	0.075

Table 8. Continued

	Table 8_R7							
	R71		R72		R73		R74	
	K1	K2	K1	K2	K1	K2	K1	K2
Table 8_R7	Z-score	Z-score	Z-score	Z-score	Z-score	Z-score	Z-score	Z-score
	P-value	P-value	P-value	P-value	P-value	P-value	P-value	P-value
	2.892	3.156	1.603	0.180	2.203	1.122	2.486	1.972
	0.004	0.002	0.110	0.857	0.028	0.263	0.013	0.049

Notes: Black color of Z-score (P- value) – there are statistically significant differences between entrepreneurs (differences between entrepreneurs K11 and K12 or differences between entrepreneurs K21 and K22), K1: our company deals with the risk management – yes (K11), no (K12); K2: our company creates a space for discussing the key risks – yes (K21), no (K22).

Figure 1. The key risks of the business environment