

Article

Management of operational risk in the context of financial performance of SMEs

Mária Hudáková ^{1,*}, Peter Kardoš ¹, Ján Dvorský ², Charles Randy Afful ³ and Jitka Kloudova ⁴

¹ Department of Crisis management Faculty of Security Engineering, University of Zilina, Univerzitna 1, 010 26 Zilina, Slovakia; maria.hudakova@uniza.sk; peter.kardos@prims.sk

² Department of Economics, Faculty of Operational and Economics of Transport and Communications, University of Zilina, Univerzitna 1, 010 26 Zilina, Slovakia; jan.dvorsky@uniza.sk;

³ Department of Business Administration, Faculty of Management and Economics, Tomas Bata University in Zlin, Mostní 5139, 760 01 Zlin, Czech Republic; afful@utb.cz;

⁴ Faculty of Business, Pan-European University, Spálená 76/14, 110 00, Prague, Czech Republic; jitka.kloudova@peuni.cz

* Correspondence: maria.hudakova@uniza.sk; Tel.: +421 415 136 712

Abstract: Owners and managers of small and medium-sized enterprises (SMEs) have changed their perspective on risk management due to the current global negative threats in the business environment. If they want to be successful and ensure the financial performance of their business, they must accept a proactive approach to reducing strategic risks in connection with operational risks. The aim of the article is to identify and quantify the differences in operational risk management and its effect on the financial management of SMEs between four Central European countries. The statistical sample of SMEs consisted of 1,090 owners and top managers. Data collection was carried out through a questionnaire in the period December 2022-January 2023. Statistical hypotheses were evaluated with the application of correlation analysis and linear regression modelling. Empirical findings have confirmed that operational risk management has a significant positive impact on improving the profitability of the enterprise; on reducing the enterprise's indebtedness as well as in the context of reducing the enterprise's inability to pay its obligations. However, there are disparities in the perception of this influence between owners/managers with regard to the country in which they carry out their business activities. The findings are important for both national and multinational organizations and entities dealing with risk management in the business environment of small and medium-sized enterprises.

Keywords: financial performance; management; operational risk; SMEs; Visegrad group countries

1. Introduction

In the conditions of the Vysegrad Four (V4) countries, i.e. in Slovakia, the Czech Republic, Poland and Hungary, small and medium-sized enterprises (SMEs) are a necessary and logical part of the economic organism of each country. SMEs have an irreplaceable role, especially in the area of job creation and regional development [1,2]. According to Khan et al. [3], a quality business environment that creates conditions for achieving long-term sustainable economic growth is a basic prerequisite for business development and increasing competitiveness in the V4 countries on an international scale. Business in the V4 countries since 2020 represents a period full of changes and uncertainty [4-6]. Waiho et al. [7] state that the pandemic of the COVID-19 virus brought with it a number of negative impacts that affected not only the business environment, but also the entire society. SMEs had to deal with the implementation of a number of anti-pandemic measures that limited business activity to varying degrees [8]. Subsequently, the war in Ukraine continues to exacerbate ongoing adverse effects and slow growth. In both the world economy and the EU economy, the prices of energy

commodities are the most affected [9]. Inflation reaches record high values as a result of energy prices. Inflation reaches record high values as a result of energy prices. According to an EU study [10] even though the whole world is facing high inflation at record levels for the last several decades, the eurozone is objectively the worst in international comparison. The consequences of the pandemic intensified by Russian aggression in Ukraine have combined on the European continent. The combination of these two factors, when the post-pandemic recovery brought rising prices and was followed by a sharp spike in energy prices, caused major problems for Europe. According to Dvorský et. al. [11] unpredictability and uncertainty in the business environment are considered the most fundamental problems also by investors, which decreases the competitiveness of countries in the long term perspective.

The size of individual negative impacts on SMEs depends on the socioeconomic conditions of individual countries, but also on the ability and readiness of the enterprise to face these negative events [12]. The authors of the study, draw attention to the vulnerability of European countries to the effects of negative threats and recommend applying innovative strategies to reduce their impacts [13]. Currently, industries have started to implement the concept of risk management more in their management strategy and adapt it to the newly created conditions [14]. According to Ciocoiu et al. [15], it is important to assess the extent to which individual elements of risk resistance are created and implemented. It is also necessary to clearly establish the responsibility of owners and managers of SMEs for the implementation of the risk management system, which is one of the key aspects of resilience, sustainability and financial performance of enterprises [16].

An innovative view of risk management, influenced by the current negative threats from the business environment in the V4 countries, influences the formation of new attitudes of owners and managers of SMEs, placing more emphasis on the prevention of business crises [17]. Ferreira de Araújo Lima et. al. [18] state, that it is very important and necessary to set up a risk management strategy so that, under the influence of external threats, it manages to reduce strategic risks, which have a strong impact on operational risks. New and proactive management of SMEs with a focus on risk management contributes to greater sustainability and increasing the financial performance of SMEs [19]. These facts motivated the team of authors to conduct this study, the aim of which is to examine changes (differences) in operational risk management and its impact on the financial management of SMEs between four Central European countries.

Conducting an in-depth statistical analysis focused on evaluation of the impact of operational risks on the enterprise financial management in the SMEs segment among the countries of the Visegrad group is a unique and original way to demonstrate causal links in the context of business sustainability with respect to the country of business.

The subject of the examination is the search for an answer to the following question:

RQ: Is the country of SME business a significant factor in the perception of operational risk in the context of financial management of the enterprise among owners/top managers in Central European countries?

The article is conceived as follows. Critical literature research in the field of operational risk and financial management of enterprise performance forms the basis for conducting quantitative research in the business environment of Central European countries. Another part of the article consists of the methodology of collecting empirical data; questionnaire structure and defining variables; formulation of statistical methods and tools for their verification and structure of the sample of respondents. Subsequently, the empirical results are presented in tables and regression equations. The discussion includes comparison and dissemination of empirical findings from the business environment in the SMEs segment with other studies and results. In conclusion, the authors indicate the further direction of the scientific research focus and their activities. Also, in the conclusion, they formulate the main findings, the limits of empirical research and define the user of the achieved findings.

2. Theoretical background

The ability to maintain the financial performance of the enterprise and the ability to effectively manage business risks are closely related [20]. Enterprise risk management is an important element of effective strategic management, which through its activities try to reduce the negative impact of various types of risks - strategic, financial, operational, personnel... on planned objectives [21]. The financial performance of SMEs is sensitive to changes in the business environment. The presence of threats in business (e.g. the COVID-19 pandemic; Russia-Ukraine conflict) manifests itself in negative contexts in connection with operational risk management. The growth of SMEs costs in countries close to military conflict (countries of the Vysegrad Group) are affected to the greatest extent. Many research studies examine the importance and benefit of risk management in the enterprise and currently also assess various negative influences and impacts on the financial performance of enterprises [4,22-24]. The mentioned research studies and empirical researches declare the growing interest of research teams in examining the issue of risk management in the enterprise, which is also testified by the following processed analysis.

2.1. Operational risk

Operational risk exists in every organization regardless of its size. Lopez [25] defines operational risk as "the risk of loss arising from inadequate or failed internal processes, people and systems or from external events". This definition includes human error, fraud and malice, information systems failures, personnel management problems, commercial disputes, accidents, fires, floods. From a narrower perspective, risk is limited exclusively to events occurring within the organization or, more specifically, to those caused solely by human error [21].

According to Agarwal and Ansell [26], operational risks include process or system failures, legality and compliance, illegal or criminal activity and human factors. Bai et al. [27] defines operational risk as the risk resulting from the execution of the enterprise's business activities. The risk that the enterprise's internal procedures, policies and systems are not adequate to prevent a loss, whether due to market conditions or operational difficulties [28]. Such deficiencies may arise from improper measurement or reporting of risk or from a lack of control over key managers.

Dumitrescu and Deselnicu [29] and Holla et al. [30] define operational risks mainly with the failure of production processes, systems and services, i.e. these are risks resulting from business interruption. This mainly concerns limitations of the production process, technical breakdowns, accidents, failure to master the technological process, insufficient utilization of the production capacities, low rate of innovations, obsolete production equipment, non-compliance with the quality of the production process, product failure, as well as external sources of risk, e.g. loss of suppliers, lack of resources and raw materials, etc.

Several authors (e.g. [27,31]) state that among the most serious sources of operational risks that significantly affect the development of SME business are: outdated production equipment, missing technologies, inability to innovate. Obsolete production equipment or missing new technologies greatly affect the sustainability of SMEs. Tucek, Hrbáčková, [32] state that new trends, technological development, but also the interconnectedness of economies and markets force enterprises to constantly deal with innovating production equipment, technologies and procedures. Currently, terms such as intelligent enterprise, intelligent logistics and transport systems, as well as the very concept of Industry 4.0 are increasingly coming to the fore.

According to Avilov et al. [33] it is necessary for SMEs to adapt to current trends in the field of production technologies, as well as the introduction of intelligent and self-learning systems into the production process. Enterprises often lack technology, which they then have to rent, which causes additional production costs [31]. Due to the influence of personnel, as well as financial and economic risks, companies have significant problems in the field of innovation in the current environment and that is the lack of interest of SMEs to innovate. They perceive the costs spent on research and development of new products as unnecessary costs, similarly, due to the significant conservative

approach of the owners, there is no willingness to provide new services, thus lagging behind the competition [34]. This is subsequently reflected in the financial stability and competitiveness of the enterprise.

According to Allahar [35], SMEs are afraid to invest, because the costs will be reflected in a higher price of products or services, as a result of which enterprises significantly lose their competitive advantage. Innovation has a profound and significant impact on a enterprise's competitiveness through increasing productivity. For enterprises, it is necessary that the product always complies with the standards, which determine its quality. Product quality affects the prosperity, efficiency and competitiveness of SMEs as well [36]. The manufacturer obtains higher sales for quality products even with an unlimited amount of sales, as a result of a higher price than the competition can achieve [37]. With quality, the enterprise can not only establish itself in existing markets, but can also create new markets with its original products.

According to Gok et al. [38] quality makes it possible to increase exports compared to the competition, thereby obtaining foreign exchange, which enables the purchase of modern equipment and technologies abroad and consequently the enterprise creates a lead over the existing competition.

2.2. Financial performance of SMEs

Financial management is a key part of every SME, as the main goal of business is to increase the market value of the enterprise and maximize profit [39]. An enterprise must make a profit in order to provide a return to all investors and to grow and invest. According to Chang and Wu [40], financial management represents the main function of management and affects all parts of the enterprise. When choosing an appropriate financial policy, it is very important to monitor the enterprise's performance with regard to predefined goals that are aligned with the interests of all entities. Ślusarczyk and Grondys [19] state that the measurement and evaluation of performance becomes not only an important process in assessing the success of the enterprise, but also a process which, based on the analysis of the effectiveness of the enterprise's financial operations, supports the development and increase of the long-term competitiveness of the enterprise.

According to Udoh [41], the basic tool for evaluating financial performance is the application of financial analysis. The financial analysis of SMEs enables a comprehensive assessment of the quality of business activities and the economic level of business entities. Zhao and Zeng [42] define financial analysis as an analytical activity that interprets financial information in assessing a enterprise's performance and prospects, as well as in comparison with other enterprises and industry results. Financial analysis acts primarily as feedback on what the enterprise has achieved and what assumptions it has managed to fulfil, therefore it is obvious that it forms an integral part of the financial management of the entire enterprise [43]. The main purpose of financial analysis is to provide a methodical apparatus which, through available resources, enables a comprehensive evaluation of the financial situation and assessment of the financial health of the enterprise [44]. Kotaskova et al. [45] define the financial situation as financial performance, which is measured mainly by profitability, and the financial position of the enterprise, which reflects the risks associated with the way the enterprise is financed. The concept of financial health expresses a satisfactory financial situation in which the enterprise is able to consistently achieve the level of appreciation of invested capital, which is required by investors in view of the risk of the given type of business. Olah et al. [46] perceive financial analysis as a tool for measuring performance from a time point of view, on two levels. The first of them is the fact that financial analysis provides us with a certain insight into the past, thanks to which it offers the possibility to evaluate the development of the enterprise based on a whole range of criteria. The second level is represented by the fact that financial analysis serves as a basis for financial planning in all time planes. In addition to evaluating the current financial situation, it also enables short-term planning associated with the normal operation of the enterprise, as well as strategic planning associated with the long-term development of the enterprise.

As part of financial management, SMEs should, among other things, monitor and evaluate internal and external factors that influence financial analysis and thus affect the performance of the

enterprise [47]. The enterprise cannot be analyzed as an isolated entity, because its success is influenced not only by the influences of the external environment but also by its connection to the activities of the internal environment [17]. According to Christensen et al. [48] by analysing the financial situation of the enterprise, it is possible to reveal the strong and weak points of the enterprise's activities and, based on the prediction of development, to reveal potential risks that could cause or will cause financial difficulties in the future, or financial crisis of the enterprise. In general, the main task of financial analysis is considered to be the identification of the causes that condition the financial situation of the enterprise and actively contribute to its improvement and stabilization [49].

Financial analysis indicators are used to monitor revenues and costs and overall financial management in enterprise [50]. They focus on the information available in the profit and loss statement and balance sheet of the enterprise. In every enterprise, it is also important to solve the procedure for optimally solving the relationship between fixed and variable costs. If a large part of the operating costs are fixed, then the operating profit will decrease significantly with a decrease in sales. According to Bogodistov and Wohlgemuth, [51], this phenomenon refers to operating leverage (OL - Operating leverage) expresses the sensitivity of the reaction of operating profit (EBIT - profit excluding tax and interest) to a change in the enterprise's total revenues (TR - Total revenues). Knowing this relationship is an important prerequisite for ensuring the enterprise's liquidity and long-term profitability, as well as managing production (operational) risk. According to Zhao, and Zeng [42], operational risk is primarily influenced by the share of fixed costs in total costs. Rate, or the degree of operational risk is determined by the degree of operational leverage [52]. Operational risk is mainly related to the reduction of demand for products, the quality of management, the intensity of competition on the relevant market, the degree of diversification of the enterprise's product portfolio, the quality of products, the use of technology, the qualifications of employees, etc.

3. Research methodology

The aim of the article is to identify and quantify the differences in operational risk management and its effect on the financial management of small and medium-sized enterprises (SMEs) between four Central European countries.

3.1. Data collection

Data collection was carried out in the following steps. In the first step, research workplaces in V4 countries were approached in order to analyse the factors determining the sustainability and financial performance of SMEs in the business environment of Central Europe. The research team consists of the following research departments: i. Department of Economics, University of Zilina, Slovakia; ii. Department of Crisis Management, University of Zilina, Slovakia; iii. John von Neumann University, Hungary; iv. Department of International Business, University of Gdańsk, Poland; v. Department of Microeconomics, University of Gdańsk, Poland; vi. Department of Business Administration, Tomas Bata University in Zlín, Czech Republic. In the second step, the final version of the questionnaire (English version) was created, named „Effect of selected factors on the sustainability in the segment of small and medium-sized enterprises“. The questionnaire was subsequently translated into the national language of the partner countries. The respondent was defined as the owner or top owner of a small and medium-sized enterprise (SME) that operates in the business environment in the selected country of the Vysegrad Group (V4; CR – Czech Republic, SR – Slovakia; PL – Poland; HU – Hungary). In the third step, the renowned external agency MNFORCE was contacted in order to create a sample of respondents using Computer-Assisted Web Interviewing (CAWI Research Method). The minimum number of respondents in the selected research countries was the result of the sample size analysis. The main criterion for data collection was the proportional percentage expression of MPS according to demographic characteristics, which

can be found from public sources at the national level (e.g. Statistical Office of the Slovak Republic, etc.). The data collection itself was carried out between December 2022 and January 2023.

3.2. Questionnaire and variables

The questionnaire was created in electronic form. The questionnaire included a control question to verify the consistency of the respondent's answers. The respondent was excluded from the sample set in case of different attitudes of the respondent to the control question. The online questionnaire was secured against automatic computer filling. At the beginning of the questionnaire, the respondents had to answer the question whether they consent to the publication of their positions on the statements in the questionnaire for scientific purposes. 26 respondents did not give their consent. Their attitudes were immediately excluded from the statistical survey. The respondent did not publish any sensitive information about himself - complete anonymity of the respondent.

The questionnaire was constructed from several separate parts: demographic characteristics of the SME (e.g. size of the enterprise; legal form of enterprise; industry of enterprise; period of operation of the enterprise in the business environment; location of operation of the enterprise; country of enterprise); demographic characteristics of the respondent (e.g. gender; age; highest level of education; correlation of the level of education with the business sector; the position of the respondent in an SME) and formulated statements on selected sources of business risks (personnel risk, financial risk, market risk, enterprise reputation, legal risk, crisis phenomena in business, operational risk). To evaluate the scientific questions of the article, the following variables were analysed:

- Independent variables (operational risk statements; ORS): Our enterprise has a sufficient utilisation of the production capacities (ORS1). The enterprise suppliers' prices for products and services are adequate (ORS2). Our enterprise has no problem with distribution of our products/services (ORS3). Our enterprise has no problem with the suppliers (e.g. cooperation, numbers of suppliers, relationships; ORS4).
- Dependent variables (financial performance of SMEs; FPS): Our enterprise has a sufficient profit (FPS1). The indebtedness of the enterprise is adequate (not a high share of debt; FPS2). Our enterprise has no problem with an ability to pay obligations (insolvency; FPS3).

The respondent had to answer the selected statements with one of the following types of answers (processed according to a 5-point Likert scale): I completely agree with the statement (1); ...; I completely disagree with statement (5). The questionnaire was designed so that positive responses to the independent variables linearly converged to positive responses to the dependent variables.

3.3. Statistical hypothesis and statistical methods

To evaluate the main goal of the article, the following statistical hypotheses (SH) were formulated:

SH: There is a statistically significant influence of selected operational risk indicators (SH1: ORS1; ...; SH4: ORS4) on financial management (SH1_1: FPS1; ...; SH1_3: FPS3) among owners/top managers of SMEs with regard to the country in which do business (CR, PL, HU, SR, V4).

Descriptive statistics and their characteristics (mean, standard deviation; skewness; kurtosis) were used for the initial analysis of variables with the partial aim of verifying the multiple normal distribution of the formulated variables (see more in table 1). The subject of further statistical investigation was the application of correlation analysis. The aim of the correlation analysis was the calculation and verification of the statistical significance of the pairwise coefficients of dependence between independent and dependent variables (see more in Table 2). Verification of statistical significance was carried out with the application of t-stat. Due to the nature of the variables, linear regression modelling (LRM) can be considered a suitable mathematical-statistical method. In this context, it is important to emphasize that the goal of applying LRM to data evaluation is not to predict

the dependent variable in the future, but only to verify the statistical significance of the selected independent variables (or their influence) on the selected independent variable. LRMs and their statistical significance were verified using the F-test. Regression coefficients were calculated by the method of least squares and their statistical significance was verified by t-Stat. Due to the fact that the data are not time series data, autocorrelation is not the subject of the analysis. Verification of the negative phenomenon of multicollinearity in LRM was verified using the Variance Inflation Factor (VIF).

3.4. Structure of respondents in V4 countries

Out of the total number of 1,129 questionnaires, 2.3% (n = 26) of respondents did not consent to the publication of their positions for scientific purposes. Structure of the sample set of respondents (n = 1,090) according to: country of operation of the SME: 301 (27.6%) – PL; 362 (33.2%) – CR; 162 (14.9%) - SR; 265 (24.3%) HU. 64.6% of micro-enterprises filled out the questionnaire. The largest representation of enterprises according to the legal form of business are sole trader (54%) and limited liability company (37.2%). Up to 33.5% of enterprises that have been operating in the business environment for more than 10 years participated in the research. 39% of enterprises have their headquarters in the capital of the country. 44.9% of women completed the questionnaire; 41.2% of respondents with a bachelor's degree as their highest education; 78.8% of SME owners. More than 35% of the respondents said that some activities in the enterprises they perform are correlated with their highest level of education. Most respondents indicated that their motivation to start a business was mainly money (64.6%) and mission (25.5%). The sample of respondents considers the most important characteristic of an entrepreneur to be flexibility (29.5%) and creativity (28.7%) in business.

4. Empirical results

Descriptive characteristics of selected variables (dependent; independent) are the subject of table

Table 1. Descriptive characteristics of defined variables.

V4	FPS1	FPS2	FPS3	ORS1	ORS2	ORS3	ORS4
M	2.390	2.244	1.981	2.172	2.599	2.212	2.272
SD	1.092	1.029	0.944	0.934	1.141	0.980	1.042
V	1.193	1.059	0.891	0.872	1.302	0.961	1.085
S	-0.394	0.210	1.063	0.029	-0.755	0.267	0.014
K	0.605	0.750	1.042	0.614	0.353	0.744	0.719
SR	FPS1	FPS2	FPS3	ORS1	ORS2	ORS3	ORS4
M	2.720	2.476	2.110	2.445	2.854	2.439	2.390
SD	1.180	1.088	0.940	0.955	1.259	1.046	1.006
V	1.393	1.183	0.884	0.911	1.586	1.094	1.012
S	-1.031	-0.258	1.119	-0.114	-1.139	-0.002	0.108
K	0.222	0.497	0.945	0.330	0.131	0.701	0.726
CR	FPS1	FPS2	FPS3	ORS1	ORS2	ORS3	ORS4
M	2.285	2.202	1.677	2.215	2.859	2.047	2.218
SD	0.908	0.999	0.743	0.827	1.091	0.849	0.990
V	0.825	0.998	0.552	0.685	1.191	0.721	0.980
S	0.973	0.503	2.219	0.082	-1.034	1.152	-0.025
K	1.081	0.827	1.212	0.553	0.154	0.948	0.757
PL	FPS1	FPS2	FPS3	ORS1	ORS2	ORS3	ORS4
M	2.442	2.327	2.218	2.026	2.271	2.231	2.281
SD	1.194	1.065	1.042	0.938	1.013	0.963	1.041
V	1.426	1.135	1.085	0.880	1.026	0.927	1.083
S	-0.818	-0.006	0.139	0.130	-0.061	0.148	-0.142

K	0.408	0.675	0.757	0.771	0.573	0.622	0.588
HU	FPS1	FPS2	FPS3	ORS1	ORS2	ORS3	ORS4
M	2.305	2.097	2.068	2.111	2.462	2.287	2.258
SD	1.111	0.960	0.978	1.003	1.159	1.081	1.131
V	1.234	0.922	0.956	1.006	1.343	1.169	1.278
S	-0.440	0.441	0.783	0.159	-0.562	-0.344	0.022
K	0.548	0.811	0.956	0.745	0.469	0.544	0.787

Note: M – Mean; SD – Standard Deviation; V – Variance; S – Skewness; K – Kurtosis. Source: own statistical processing.

The highest rate of agreement in the evaluation of dependent variables (FPS) is among Czech respondents for the statement FPS3 (CR: M = 1.677). On the other hand, the lowest rate of agreement in the evaluation of dependent variables (FPS) is among Slovak respondents for the statement FPS1 (SR: M = 2.720). The highest rate of agreement in the evaluation of independent variables (ORS) is among Polish respondents for the statement ORS1 (PL: M = 2.026). On the other hand, the lowest rate of agreement in the evaluation of dependent variables (FPS) is among Czech respondents for the statement FPS1 (CR: M = 2.859). Skewness and Kurtosis for each variable is in the interval of values from -2 to 2. The assumption of multiple normal distribution of the defined variables is accepted due to the stated values.

Table 2. Correlation matrices according to the country of operation of SMEs in the business environment.

V4	FPS 1	FPS 2	FPS 3	ORS 1	ORS 2	ORS 3	ORS 4	SR	FPS 1	FPS 2	FPS 3	ORS 1	ORS 2	ORS 3	ORS 4
FPS 1	1							FPS 1	1						
FPS 2	0.47	1						FPS 2	0.52	1					
FPS 3	0.38	0.49	1					FPS 3	0.40	0.55	1				
ORS 1	0.48	0.32	0.31	1				ORS 1	0.46	0.46	0.42	1			
ORS 2	0.44	0.32	0.24	0.47	1			ORS 2	0.52	0.49	0.39	0.45	1		
ORS 3	0.48	0.34	0.38	0.47	0.50	1		ORS 3	0.47	0.44	0.40	0.40	0.56	1	
ORS 4	0.41	0.35	0.40	0.37	0.49	0.61	1	ORS 4	0.45	0.48	0.51	0.37	0.54	0.73	1
CR	FPS 1	FPS 2	FPS 3	ORS 1	ORS 2	ORS 3	ORS 4	PL	FPS 1	FPS 2	FPS 3	ORS 1	ORS 2	ORS 3	ORS 4
FPS 1	1							FPS 1	1						
FPS 2	0.21	1						FPS 2	0.63	1					
FPS 3	0.24	0.29	1					FPS 3	0.45	0.57	1				
ORS 1	0.29	0.09	0.19	1				ORS 1	0.58	0.44	0.43	1			
ORS 2	0.28	0.07	0.08	0.18	1			ORS 2	0.57	0.55	0.50	0.65	1		

ORS ₃	0.30	0.03	0.16	0.24	0.23	1	ORS ₃	0.62	0.55	0.53	0.63	0.70	1		
ORS ₄	0.29	0.09	0.23	0.17	0.33	0.37	1	ORS ₄	0.54	0.59	0.53	0.45	0.61	0.72	1
HU	FPS1	FPS2	FPS3	ORS1	ORS2	ORS3	ORS4								
FPS1	1														
FPS2	0.51	1													
FPS3	0.40	0.60	1												
ORS1	0.56	0.35	0.31	1											
ORS2	0.51	0.34	0.28	0.60	1										
ORS3	0.48	0.40	0.36	0.56	0.65	1									
ORS4	0.37	0.36	0.38	0.48	0.60	0.65	1								

Note: All pairwise dependence coefficients are statistically significant at the 0.05 significance level.

Source: own statistical processing.

The results of the correlation analysis showed moderate to strong positive dependencies between selected FPS and ORS indicators in SR, PL, HU (pairwise correlation coefficients range from 0.4 to 0.63). According to the Czech respondents, the dependencies between FPS and ORS indicators show very weak to weak dependencies.

ORS the highest rate of agreement in the evaluation of dependent variables (FPS) is among Czech respondents for the statement FPS3 (CR: M = 1.677). On the other hand, the lowest rate of agreement in the evaluation of dependent variables (FPS) is among Slovak respondents for the statement FPS1 (SR: M = 2.720).

The highest rate of agreement in the evaluation of independent variables (ORS) is among Polish respondents for the statement ORS1 (PL: M = 2.026). On the other hand, the lowest rate of agreement in the evaluation of dependent variables (FPS) is among Czech respondents for the statement FPS1 (CR: M = 2.859). Skewness and Kurtosis for each variable is in the range of values from -2 to 2. The assumption of a multiple normal distribution of the defined variables is accepted due to the stated values.

4.1. Effect of operational risk indicators on FPS1

By applying linear regression modelling, the statistical significance of LRM1 for V4 countries was verified in the joint model and separately for each country (see table 3).

Table 3. Verification of the influence of ORS indicators on FPS1.

RA	LRM1					
	CR	SR	PL	HU	V4	
R	0.440	0.606	0.683	0.612	0.586	
R ²	0.193	0.367	0.467	0.374	0.343	
Adj. R ²	0.184	0.351	0.460	0.365	0.341	
SE	0.820	0.951	0.879	0.885	0.887	
N	362	162	301	265	1,090	
ANOVA						
F- test	21.374	23.026	64.995	40.980	141.801	
Sig.	0.000***	0.000***	0.000**	0.000***	0.000**	
Verification of the statistical significance of RC with the application of t-Stat.						
Constant	4.550***	2.361*	2.180*	4.600***	6.542***	
ORS1	3.992***	3.314***	4.647***	5.830***	9.281***	
ORS2	3.051**	3.276***	1.882	2.775**	5.093***	
ORS3	3.161**	1.407	3.135**	2.529*	6.134***	

ORS4	2.722**	1.265	2.726**	-0.603	3.425**
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Note: RA – Regression Analysis; RC – Regression Coefficient; SE – Standard error; R² - Coefficient of determination; Adj. R² - Adjusted Coefficient of determination; N – number of respondents; LRM – Linear regression model. Source: own statistical processing.

Table 3 shows that LRM1 separately in selected research countries that investigated the causal relationship between FPS1 and ORS indicators are statistically significant at the 0.1% significance level. Linear regression models explain from 18.5% (CR) to 46.0% (PL) of the variability of the dependent variable FPS1. Linear regression functions with regression coefficients take the following forms:

- CR: $LRM1: FPS_1 = 0.775 + 0.217 \times ORS_1 + 0.130 \times ORS_2 + 0.177 \times ORS_3 + 0.133 \times ORS_4$
- SR: $LRM1: FPS_1 = 0.568 + 0.297 \times ORS_1 + 0.251 \times ORS_2 + 0.153 \times ORS_3 + 0.141 \times ORS_4$
- PL: $LRM1: FPS_1 = 0.310 + 0.351 \times ORS_1 + 0.146 \times ORS_2 + 0.288 \times ORS_3 + 0.198 \times ORS_4$
- HU: $LRM1: FPS_1 = 0.661 + 0.401 \times ORS_1 + 0.187 \times ORS_2 + 0.186 \times ORS_3 - 0.039 \times ORS_4$
- V4: $LRM1: FPS_1 = 0.540 + 0.318 \times ORS_1 + 0.150 \times ORS_2 + 0.228 \times ORS_3 + 0.116 \times ORS_4$

The results of the verification of a negative phenomenon such as the presence of multicollinearity in regression models (LRM1; ...; LRM3) are as follows:

CR: ORS₁: VIF = 1.085; ORS₂: VIF = 1.157; ORS₃: VIF = 1.216; ORS₄: VIF = 1.258

SR: ORS₁: VIF = 1.315; ORS₂: VIF = 1.673; ORS₃: VIF = 2.342; ORS₄: VIF = 2.271

PL: ORS₁: VIF = 1.950; ORS₂: VIF = 2.405; ORS₃: VIF = 3.054; ORS₄: VIF = 2.219

HU: ORS₁: VIF = 1.691; ORS₂: VIF = 2.156; ORS₃: VIF = 2.245; ORS₄: VIF = 1.921

V4: ORS₁: VIF = 1.421; ORS₂: VIF = 1.573; ORS₃: VIF = 1.838; ORS₄: VIF = 1.709

The presence of multicollinearity was not confirmed in any LRM. Dependencies between independent variables in LRMs are not statistically significant.

4.2. Effect of operational risk indicators on FPS2

The results of the verification of the statistical significance of the independent variables (ORS₁, , ORS₄) on the dependent variable FPS2 are the subject of table 4. In order to achieve the highest possible consistency of the models, stepwise linear regression analysis was used.

Table 4. Verification of the influence of ORS indicators on FPS2.

RA	LRM2				
	CR	SR	PL	HU	V4
R	0.117	0.597	0.642	0.439	0.428
R ²	0.014	0.357	0.412	0.193	0.183
Adj. R ²	0.008	0.340	0.404	0.181	0.180
SE	0820	0.884	0.823	0.869	0.932
N	362	162	301	265	1,090
ANOVA					
F- test	2.470	22.023	52.007	16.360	60.726
Sig.	0.086	0.000**	0.000**	0.000**	0.000**
Verification of the statistical significance of RC with the application of t-Stat.					
Constant	10.256***	2.248*	4.299***	7.427***	11.274***
ORS1	1.415	3.554***	1.346	2.149*	4.598***
ORS2	-	2.620**	3.269**	0.649	3.191**
ORS3	-	0.526	1.092	2.428*	2.761**
ORS4	1.456	2.379*	5.245***	1.634	5.116***

Note: RA – Regression Analysis; RC – Regression Coefficient; SE – Standard error; R² - Coefficient of determination; Adj. R² - Adjusted Coefficient of determination; N – number of respondents; LRM – Linear regression model. Source: own statistical processing.

Table 4 shows that LRM2 separately in selected research countries that investigated the causal relationship between FPS2 and ORS indicators are statistically significant at the significance level of 0.1% except for LRM2 in the Czech Republic (p-value of F-test = 0.086). In the Czech Republic, the causal relationship of ORS indicators on FPS2 has not been proven. Other linear regression models explain from 18.1% (HU) to 40.4% (PL) of the variability of the dependent variable FPS2. Linear regression functions with regression coefficients take the following forms:

- SR: $LRM2: FPS_2 = 0.502 + 0.295 \times ORS_1 + 0.186 \times ORS_2 + 0.053 \times ORS_3 + 0.247 \times ORS_4$
- PL: $LRM2: FPS_2 = 0.573 + 0.095 \times ORS_1 + 0.237 \times ORS_2 + 0.094 \times ORS_3 + 0.356 \times ORS_4$
- HU: $LRM2: FPS_2 = 1.048 + 0.145 \times ORS_1 + 0.043 \times ORS_2 + 0.175 \times ORS_3 + 0.104 \times ORS_4$
- V4: $LRM2: FPS_2 = 0.976 + 0.166 \times ORS_1 + 0.099 \times ORS_2 + 0.109 \times ORS_3 + 0.181 \times ORS_4$

4.3. Effect of operational risk indicators on FPS3

The results of the verification of the statistical significance of the independent variables (ORS1, ..., ORS4) on the dependent variable FPS3 are the subject of table 5. In order to achieve the highest possible consistency of the models, stepwise linear regression analysis was used.

Table 5. Verification of the influence of ORS indicators on FPS3.

RA	LRM3				
	CR	SR	PL	HU	V4
R	0.276	0.574	0.592	0.419	0.457
R ²	0.076	0.329	0.350	0.176	0.208
Adj. R ²	0.071	0.312	0.342	0.1667	0.206
SE	0.716	0.780	0.846	0.892	0.841
N	362	162	301	265	1,090
ANOVA					
F- test	14.775	19.504	40.046	19.563	71.430
Sig.	0.000***	0.000***	0.000***	0.000***	0.000***
Verification of the statistical significance of RC with the application of t-Stat.					
Constant	8.076***	2.621*	4.510***	7.555***	10.572***
ORS1	2.945**	3.391**	1.612	1.761	4.698***
ORS2	-	0.955	2.120*	-	-1.242
ORS3	-	-0.385	1.996*	1.828	4.692***
ORS4	4.018***	4.108***	3.840***	3.169***	7.487***

Note: RA – Regression Analysis; RC – Regression Coefficient; SE – Standard error; R² – Coefficient of determination; Adj. R² – Adjusted Coefficient of determination; N – number of respondents; LRM – Linear regression model. Source: own statistical processing.

Table 5 shows that LRM3 separately in selected research countries that investigated the causal relationship between FPS3 and ORS indicators are statistically significant at the significance level of 0.1%. Linear regression models explain from 7.1% (CR) to 34.2% (PL) of the variability of the dependent variable FPS3. Linear regression functions with regression coefficients take the following forms:

- CR: $LRM3: FPS_3 = 1.031 + 0.136 \times ORS_1 + 0.155 \times ORS_4$
- SR: $LRM3: FPS_3 = 0.517 + 0.249 \times ORS_1 + 0.060 \times ORS_2 - 0.034 \times ORS_3 + 0.376 \times ORS_4$
- PL: $LRM3: FPS_3 = 0.618 + 0.117 \times ORS_1 + 0.158 \times ORS_2 + 0.177 \times ORS_3 + 0.268 \times ORS_4$
- HU: $LRM3: FPS_3 = 1.078 + 0.115 \times ORS_1 + 0.128 \times ORS_3 + 0.201 \times ORS_4$
- V4: $LRM3: FPS_3 = 0.829 + 0.153 \times ORS_1 - 0.035 \times ORS_2 + 0.166 \times ORS_3 + 0.240 \times ORS_4$

The interpretation of statistical hypotheses with regard to the achieved results (see table 3-5) is the subject of the following table 6.

Table 6. Evaluation of formulated hypotheses.

LRM1						LRM2						LRM3					
EPS1	CR	SR	PL	HU	V4	EPS2	CR	SR	PL	HU	V4	EPS3	CR	SR	PL	HU	V4
ORS1	S	S	S	S	S	ORS1	R	S	R	S	S	ORS1	S	S	R	R	S
ORS2	S	S	R	S	S	ORS2	R	S	S	R	S	ORS2	R	R	S	R	R
ORS3	S	R	S	S	S	ORS3	R	R	R	S	S	ORS3	R	R	S	R	S
ORS4	S	R	S	R	S	ORS4	R	S	S	R	S	ORS4	S	S	S	S	S

Note: S – Hypothese was supported; R – Hypothese was rejected. Source: own statistical processing.

5. Discussion

Main findings of the quantitative research conducted in the V4 countries:

Owners/top managers think that the ability to use production capacity has the most significant impact on achieving sufficient profit regardless of the country in which the SME operates. Czech and Hungarian owners/top managers also consider other sources of operational risk to be significant (although to a lesser extent) in contrast to Slovak and Polish owners/top managers.

Czech SME owners/top managers believe that operational risk management does not affect the adequacy of the enterprise's indebtedness. On the contrary, Hungarian, Slovak and Polish owners/top managers consider operational risk management to be significant and have a positive impact on the enterprise's indebtedness. In this context, the Hungarian respondents perceive that the distribution of products/services is a key aspect for the share of the enterprise's debt. Slovak owners/top managers consider the most important factor to be the enterprise's ability to use production capacities. Polish respondents perceive relationships with suppliers as key in connection with reducing the enterprise's indebtedness.

Owners/top managers in Central European countries (CR, PL, SP, HU) believe that their relationships with suppliers are crucial in relation to the inability to pay obligations (insolvency) of the enterprise. Hungarian respondents consider this source of operational risk to be the only significant factor in connection with the inability to repay obligations (insolvency) of the enterprise. Slovak and Czech respondents, in addition to the mentioned source, perceive it as necessary to monitor the utilization of production capacities in the enterprise. Polish owners/top managers believe that the reasonableness of the enterprise's suppliers' prices for products and services is also important.

Based on the processed results, it is possible to declare that operational risk management is linked to financial performance, i.e. has a significantly positive effect on improving the profitability of the enterprise, on reducing the indebtedness of the enterprise as well as reducing the inability to repay the enterprise's obligations.

The presented processed results are a link to the conclusions of the authors [53,54], who assessed the perceived sources of operational risks by the owners/top managers of enterprises in the V4 countries in 2017-2018 and 2019-2020. Among the main sources of operational risks in the countries V4 in 2017-2018 were obsolete production facilities, low rate of innovations and insufficient product quality [53]. In the years 2019-2020, insufficient product quality, low rate of innovations, obsolete production facilities and insufficient utilization of the production capacities prevailed [54].

These results are also confirmed by many other authors [6, 25, 27, 55, 27], who conducted similar research on the issue of operational and financial risks of SMEs, the sources of which are of a different nature. Lopez [25] and Popp et al. [56] point to incorrectly defined procedures and process management as the most serious causes of operational risks. This is manifested in insufficient definition of responsibilities and accountabilities. According to Kozubíková et al. [57] it can be about deficiencies in the planning process and deficiencies in the control process. It is important to pay attention to the prevention of operational risks [4]. Olah et al. [46] emphasize the permanent control of the production process. As another preventive measure, it is advisable to carry out random quality control of products and supervise the supply of necessary raw materials and create good relations with suppliers [56].

Operational risks must be seen as an important factor affecting the financial performance of most SMEs in the V4 countries [1,15]. According to Kotaskova et al. [45] financial risks are significant risks in any enterprise, whether it is a small or medium-sized enterprise. The current issue of financial risk management reaches the same level of SMEs. This is also evidenced by the further processed results of the survey by the authors Olah et al. [46], which point to the greatest intensity of SME financial risk sources: inadequate profit from business, unpaid receivables, inability to pay obligations (insolvency) and corporate indebtedness. This opinion is also confirmed by other authors who deal with this issue [57]. According to several authors [4,5], there is essentially a relationship between direct business operations and the amount of debt the enterprise owes, which directly affects the level of financial risk. The more debt a business has, the more likely it will be to default on financial obligations, given that financial risk indicates the possibility that the entity's cash flow is not adequate to pay creditors and meet other financial liabilities. Apart from the importance of financial risk, it can lead to financial mismanagement in losses, indebtedness and liquidity problems. Wolmarania and Meintjes [58] concluded that setting the right systems of internal financial management policies eliminates most of the failures of SMEs and prevents financial crisis.

The results of processed worldwide studies show that operational risks are just as important as financial risks. According to the processed Allianz risk barometer study, business interruption is among the top serious business risks in the long term [59]. Also according to worldwide studies, e.g. The Global Risks Report [60], Dun & Bradstreet's World Economic Forum 2022, Key Global Risks for Businesses, shows that operational risks are still among the top 10 most severe risks. The results of the processed study by KPMG [61] also define the following as top enterprise risks: cyber security, ESG/responsible risks, market risks, operational and strategic risks, people risks, etc.

6. Conclusions

The aim of the article is to identify and quantify the differences in operational risk management and its effect on the financial management of small and medium-sized enterprises (SMEs) between four Central European countries.

Empirical research indicates that the management of operational risk positively affects the financial management of the enterprise in the business environment of SMEs in the Central European area. The findings point to the fact that there are differences in the perception of the impact of operational risk on the enterprise's financial management between the countries of the Visegrad Group. According to SMEs operating in the business environment of the Czech Republic, there is no significant influence of operational risk management on the adequacy of the enterprise's indebtedness. On the contrary, in the other V4 countries, their positive impact on reducing the enterprise's indebtedness has been demonstrated. The exact answer to the formulated scientific hypothesis (RQ) is yes. The country of SME is an important factor that determines the perception of operational risk in the context of SME financial management.

The findings are important for owners and top managers operating in the SMEs segment, not only in Central Europe, to realize the importance of operational aspects of business and possible sources of risks arising from them. The findings can serve as a basis for the creators of national and transnational policies dealing with the quality of the business environment. The findings can also be disseminated in the creation of supporting materials (e.g. preparation of workshops; educational courses for enterprises) dealing with the issue of risk management in the SMEs segment.

The findings obtained from quantitative research have certain specificities. The research was carried out in the segment of small and medium enterprises. Data collection took place in four Central European countries neighbouring Ukraine. Owners and managers of SMEs subjectively evaluated financial management and operational management in the enterprise. The research was carried out during a turbulent period - during the ongoing Russian invasion of Ukraine. Applying linear regression modelling is important in finding causal relationships between variables in only one direction.

Considering the significant findings of the impact of operational management on the financial performance of enterprises in the SMEs segment, the subject of further research activities will be the demonstration of the impact of operational risk management on business sustainability; on the future of business and in the context of the perception of the business entity regression.

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