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Factors determining the effect of financial risk in the entrepreneurial environment of small and medium-sized enterprises in the Czech Republic

Jaroslav Belas, Ján Dvorský, Jan Kubálek, Luboš Smrčka

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Jaroslav Belas, Ján Dvorský, Jan Kubálek, Luboš Smrčka
belas@fame.utb.cz, j1dvorsky@fame.utb.cz, kubj10@vse.cz, smrckal@vse.cz
Tomas Bata University in Zlín, Faculty of Management and Economics, Mostní 5139, Zlín, Czech Republic
Tomas Bata University in Zlín, Faculty of Management and Economics, Mostní 5139, Zlín, Czech Republic
University of Economics, W.Churchill Sq. 4, Prague 67, 4 130, Czech Republic
University of Economics, W.Churchill Sq. 4, Prague 67, 4 130, Czech Republic

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Abstract

Research background: Entrepreneurs enter into business with the aim of gaining the maximum possible profit. They are increasingly willing to tolerate the effect of a greater intensity of financial risk. Factors which influence the intensity of financial risk in a business are related not only to the securing of financial resources, but also to crucial decisions on the parts of entrepreneurs or the ability to manage financial risk during a crisis in small and medium-sized enterprises (SMEs).

Aim of the article: The aim of the article is to define and quantify the significance of factors which influence, by their character and effect, the intensity of financial risk in the SME entrepreneurial environment.

Methodology/methods: The selection set represented 1,141 SMEs. It was carried out in the Czech Republic in 2015. We used the "inquiring in the form of an online questionnaire" method of ascertaining data. To fulfil the main aim, we used the methods of regression and correlation analyses with the aim of determining the relationship between the intensity of financial risk and the determinants thereof. In the first step, we carried out descriptive statistics (pivot table, scatter plot, skewness, kurtosis, normal distribution plot, and histogram). In the second step, we verified assumptions by carrying out regression modelling and by testing the normal distribution of data in determinants, the assumption of linearity, multicollinearity and homoscedasticity of variables (t-test, z-test, VIF test, Bartlett's test, F-ratio), and interpreted the results (estimate coefficient of parameters, coefficient correlation, coefficient determination). All the realised tests were carried out on a 0.05 level of significance using IBM SPSS Statistics, Version 23 software.

Findings & Value added: On the basis of the results of the questionnaire investigation and using regression and correlative data analysis, we quantified the statistical significance of determinants which influence the intensity of financial risk in the SME segment. The result of key factors serves as a basis for proposing measures in the context of preventing a business from the intensity of financial risk.

Introduction

Small and medium-sized enterprises (SME) are without a doubt an essential part of every market economy (Ključnikov, Belás, Kozubíková, & Paseková, 2016; Vojtovič, 2016; Dúbravská, Mura, Kotulič & Novotný, 2015; Karpak & Topcu, 2010;). SMEs are a key factor in maintaining and creating a functional market economy, particularly as a means of stimulating competition, creating jobs, and promoting economic boost (Kessler, 2007). They contribute also to the solution of economic and social state problems (Prasetyo, 2016; Virglerova, Dobes, & Vojtovic, 2016).

In line therewith, Henderson and Weiler (2010) state that SMEs could be characterised as the most important catalyst for economic growth. 99% of all companies are from the SME segment in the European Union and the USA (Bhaird, 2010). Tamosiunas (2009) states that SMEs are among the most important factors of economic growth, which has an influence on basic trends, the entire development of economic policy, social stability and the creation of new job opportunities. Therefore the development thereof is one of the most important developments ever.

Most business decisions are made in conditions of uncertainty. This means that there is the same uncertainty and randomness in the development of conditions for business activities, during these activities and the outcome thereof. If we are able to quantify the likelihood of diversion of actual processes and outcomes from the expected level, we speak of risk. Risk is thus quantified uncertainty (Fetisovová, 2012).

International study carried out by The Economist Intelligence Unit and Dun & Bradstreet proved that businesses not only manage risks but also regularly assess the success thereof so as to achieve better results. In other countries, management of financial risks and risks connected with default is considered a given (Belás & Sopková, 2016). Corporate insolvency and the forecasting thereof is not an issue which should be overlooked (Čámská, 2016). The European society perceives financial risk, currency risk and liquidity risk as the most serious risks (Christopoulos, 2016; Mentel & Szetela & Tvaronavičienė, 2016; Brammertz et al., 2009).

Research Methodology

The main aim of the article is to define, quantify and determine the dependence of significant factors which determine the effect of the intensity of financial risk in the SME segment. Scientific hypotheses were defined in order to quantitatively evaluate our objectives:

H: The intensity of financial risk in the SME segment (IFR) is determined by correct risk management by entrepreneurs (CRM), entrepreneur knowledge of credit conditions (KCC), the influence of credit risk during a crisis (ICR), sufficient funds in SMEs (SF).

Statistical verification of data from businesses was carried out with the following procedure of steps: 1. Using a method of random selection, 1,600 businesses were selected from a basic set of businesses operating in the CR. These were acquired from the "Albertina" database using the "Randbetween" mathematical function; 2. We contacted the businesses via their e-mail address stated in the above-mentioned database or by searching on web servers; 3. We addressed the businesses by means of the inquiry method using online questionnaire forms on a created webpage; 4. The businesses were asked to have a person responsible for managing the business (proprietor, administrator, director) complete the online questionnaire; 5. In this manner it was possible to obtain statistical data from 495 businesses, which represented a 31% success rate in addressing them; 6. Subsequently, businesses from which a reply could not be acquired were contacted via telephone in cooperation with agents: students and colleagues at partner Czech universities with related professional orientation.

Through an incomplete statistical finding, it was possible to acquire a set of statistical data from 1,141 businesses (70% success rate in addressing businesses). 5,467 items of statistical data from an entire count of 60,476 from representatives of the selected set of businesses were used to fulfil the main aim of the article.

In order to fulfil the main aim, we utilised regression analysis with the aim of explaining relationships between independent variables and the dependent variable. We verified the Linearity assumption by using the scatter plot graphic tool which verified the presence of nonlinear patterns between the dependent variable and independent variables. Assuming normal distribution of data we carried out the normal probability plot for all independent variables and, with a z-test, the descriptive characteristics of independent variables (skewness, kurtosis). The critical value of acceptance of independent variables into the regression model is $|t| \geq 1.9698$ (578 degrees of freedom, significance level at 0.05). Homoscedascity was tested using a point graph and by carrying out Bartlett's test, which confirmed the assumption of homoscedascity if the p-value of the test was higher than the significance level. We verified the intensity of dependence of the dependent variable from the independent variables by means of a correlation matrix. The results of the regression model with three independent variables could challenge multicollinearity. We accept multicollinearity as long as "Variance Inflation Factor" is greater than 5 (Hair, 2010). The basic linear multiple regression model is based on the following relationship between the dependent variable (IFR) and independent variables (CRM, RCC, ICR, SF):

$$IFR = \beta_0 + \beta_{CRM}\, x\, CRM + \beta_{KCC}\, x\, KCC + \beta_{ICR}\, x\, \mathrm{ICR} + \beta_{SF}\, x\, SF, \qquad (1)$$

where *IFR* – dependent variable; β_0 – constant, β_{CRM}; β_{KCC}; β_{ICR}; β_{SF} – parameters of independent variables (CRM,RCC ICR, SF); CRM, KCC, ICR, SF – independent variables.

The credibility of the designed linear regression model was verified with the aid of the F-ratio parametric test for analysis of variance when the p-value was lower than the significance level. The regression model explains the variability of the dependent variable with the aid of an R^2 determination coefficient and an adjusted determination coefficient (Adjusted R^2). Descriptive statistics such as contingency tables and

descriptive characteristics were applied to fulfil the secondary aim. We carried out calculation by means of sophisticated SPSS Statistics software.

Literature Review

Financial risk ranks among economic (operational) risks with defined impacts on enterprise finance. According to Markovič, Vlachynský, Ponecová, and Vanc (2007), financial risk is the probability of financial loss or loss of profit as a result of operational development compared with expected development. Financial risk is mainly caused by fluctuations in financial markets and changing attitudes of entities to individual financial tools and in each transaction. The impact on enterprise results is immediate as soon as there is a carrier or source of risk in the enterprise portfolio. Enterprise results and performance can be measured by productivity indicators (Klečka, 2014).

In the next section we see authors who in their studies focused on factors which influence the intensity of financial risk: Moro and Fink reported that banks play an essential role in financing firms, especially SMEs, since they have more difficulty accessing equity capital markets. The process used by banks to decide whether and how much to lend relies on different lending technologies, and banks usually tend to use more than one technology at once (Moro & Fink, 2013). According to Neuberger and Räthke, micro-enterprises are especially predisposed to incorrect selection and moral hazard, and their access to debt financing is therefore limited. Small firms are characterised by higher information asymmetry and credit risk (Neuberger & Räthke, 2009). This opinion is confirmed by Kirschenmann and Norden, who argue that information asymmetry and bargaining power are especially important in small business lending because small firms are informationally opaque and bank-dependent. According to Frese, Gielnik (2014), it is also possible to transfer financial risk to suppliers by way of establishing contractual prices and introducing a penalisation system should contract conditions be violated. If the risk occurs, it is possible (e.g. in terms of non-compliance) that the incurred costs will be refunded by the supplier.

Business activities are significantly determined by the environment of the company, which forces it to use a particular method of behaviour and to choose particular business goals and ways of achieving them (Belás & Demjan & Habánik & Hudakova & Sipko, 2015).

Financial risk refers to the possibility that the cash flows of a business will not suffice to pay creditors and fulfil other financial responsibilities. The level of financial risk, therefore, relates less to the operations of a business *per se* and more to the amount of debt a business incurs to finance those operations. The more debt a business owes, the more likely it is to default on its financial obligations. Taking on higher levels of debt or financial liability therefore increases the level of financial risk in a business (Guzman, 2015).

Results and Discussion

Using a method of simple classification of the statistical sign of motivation for starting a business, a sample of 581 businesses which answered either money or mission to the question of motivation were selected from the set of 1,141 entrepreneurs. The structure of entrepreneurs thus selected by statistical selection was as follows: the motive of money was recorded in 330 entrepreneurs. The structure of entrepreneurs which marked the motive of money was: according to gender, 260 men and women; according to completed education, 105 with completed higher education and 225 with other education; according to sector of business operation, 11 in transportation, 113 in services, 102 in trade, 49 in construction, 52 in production and 3 in agriculture. The motive of mission was recorded in 251 entrepreneurs. The structure of entrepreneurs which marked the motive of mission was as follows: according to gender, 179 men and 79 women; according to completed education, 106 with completed higher education and 145 with other education; according to sector of business operation, 11 in transportation, 113 in services, 102 in trade, 49 in construction, 52 in production and 3 in agriculture. The perception of financial risk in the business environment among the motives for starting a business is the subject of Table 1.

Linear relationships between IFR a CRM, ICR, SF were confirmed by graphic analysis carried out in SPSS. Graphic analysis of normal distribution of data shows divergences from normal distribution in the KCC independent variable. The results of the assumption of normal data distribution are given in Table 1.

Table 1. Skewness, kurtosis and z- value of independent variables in the model of intensity of financial risk

Independent variable	Skewness	z- value	Kurtosis	z-value	Bartlett's test
SPR	-0.1684	0.5181	1.3962	1.2106	0.153
KCC	2.8473	2.6221	3.1874	2.9871	0.014
ICR	0.8721	0.9471	1.9782	2.5101	0.654
SF	1.4769	1.9685	-1.3879	-1.7149	0.415

Source: own calculations

The results confirmed that the CRM and SF independent variables fulfil the conditions of normal data distribution as well as homogeneity of variances (Bartlett's test CRM, SF > 0.05). The independent KCC and ICR variables do not fulfil the condition of normal data distribution (standardised values of the skewness and sharpness descriptive characteristics > 2.000). These independent variables can be inserted into the regression model with the aid of the t-test. We show the results in Table 2.

Table 2. Characteristics of the variables not included in the model in the first phase

Independent variable	Partial correlation	t-value
KCC	0.4853	1.231
ICR	0.6516	3.147

Source: own calculations

In Table 2 the calculated test characteristic of t-distribution in the ICR variable is higher than the critical test value. We accept ICR as an independent variable in the linear regression model. The t-test of the KCC independent variable is lower than the critical value. KCC is not a statistically significant parameter (**|t|** = 1,231). The intensity between the dependent and independent variables is illustrated in Table 3.

Table 3. Correlation matrix of variables in the model of intensity of financial risk

	IFR	SPR	ICR	SF	KCC
IFR	1				
SPR	0.68514	1			
ICR	0,59872	0.64710	1		
SF	0,54125	0.42287	0.74135	1	
KCC	0.21574	0.38511	0.18762	0.11987	1

Source: own calculations

From the results of the z-test (see Table 1), the t-test (see Table 2) and the correlation matrix (see Table 3), we accept the independent variables CRM, ICR and SF as statistically significant parameters of the linear regression model. The results of testing the significance of the thus designed regression model with three independent variables are shown in Table 4.

Table 4. Characteristics of the regression model intensity of financial risk

Least squares multiple regression					
R^2					0.5614
Adjusted R^2					0.5496
Multiple correlation coefficient					0.7493
Residual standard deviation					0.1576
Regression equation					
Independent variable	**Coefficient**	**Std. Error**	**t- Stat**	**p-value**	**VIF**
(Constant)	0.8723				
SPR	0.4583	0,2134	2.1476	0.0277	1.8532
ICR	0.2458	0,0131	18.688	<0.0001	3.1488
SF	0.3957	0.0241	16.429	<0.0001	2.7442
Analysis of variance					

F-Ratio	84.141
Significant level	<0.005

Source: own calculations

Graphic analysis of the entire model confirmed the conditions of linearity, homoscedascity and independence of deviations. The conditions of normality were also fulfilled by the results of the normal distribution graph. The Variance Inflation Factor results demonstrated the absence of the effect of multicollinearity (VIF independent variables are less than the critical value 5: CRM = 1.8532; ICR = 3.1488; SF = 2.7442). The differences between the determination coefficient and the adjusted determination coefficient are minimal (R^2 - 0.5614 and Adjusted R^2 - 0.5496). The p-value of the F-ratio of the entire regression model is less than 0.005. From the conclusions stated above (see Table 4), we proceed to formulate a regression equation with a linear function which has the form:

$$IFR = 0.4583 \times CRM + 0.2458 \times ICR + 0.3957_{x} SF, \quad (2)$$

where IFR – intensity of financial risk in the SMEs segment, CRM – correct risk management by entrepreneurs, ICR – influence of credit risk during a crisis, SF- sufficient funds in SMEs.

We accept the hypothesis that the designed regression model is statistically significant on a 0.05 significance level. The variability of selected independent variables (CRM, ICR, and SF) explains up to 56.14% of the variability of intensity of financial risk in the SME segment. Entrepreneur knowledge of credit conditions does not have a statistically significant influence and does not determine the intensity of financial risk. The determinant CRM – correct risk management by entrepreneurs – has the greatest influence on IFR. Contrariwise, the smallest influence, if statistically significant, is the determinant of the influence of credit risk on SMEs during a crisis.

Conclusions

The aim of our article was to define and quantify significant factors which determine the intensity of financial risk in the SME sector in the Czech Republic.

Our results showed that the statistically most important factor is correct risk management (CRM) by entrepreneurs, followed by sufficient financial coverage of a business using internal and external sources and the growth of credit risk during a crisis had the smallest influence on the variability of financial risk in a business. Entrepreneur knowledge of credit conditions is a statistically insignificant factor. The article can serve competent persons responsible for business management when justifying the need for preventative measures and may thereby contribute towards a permanent improvement of risk management in a business.

We are convinced that our article has defined and quantified the factors influencing the intensity of financial risk in the SME segment. There is a field for further demonstration of the significance of other factors by testing and the quantified expression thereof.

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