What is the Relationship Between Sales Growth and Insolvency Risk?

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Abstract

Sales growth is essential for an enterprise's survival and financial growth. If an enterprise manages to achieve sales growth, its expansion can be accomplished. However, does sales growth always have only positive effects? If the enterprise is not collecting enough cash, it can miss a payment on its debt, triggering a series of events that can lead to its insolvency. The goal of the paper is to explore the relationship between an enterprise's sales growth and its insolvency. The relationship is tested empirically on the data set of 4271 SMEs in Croatia. The results confirmed that there is a relationship between sales growth and insolvency. Better indicators exist with solvent and growing SMEs than with insolvent and non-growing. Results have also shown that high growth can be at the same time a high risk. The paper contributes to a deeper understanding of the relationship between sales growth and insolvency and empirically demonstrates that sales growth over 200% per year induces the highest probability of insolvency compared to other lower levels of growth.

Introduction

There are many studies investigating insolvency and sales growth but most of them are dealing either with insolvency or sales growth, not with both of them together. It is reasonable to expect that there is a relationship between sales growth and insolvency. To finance sales growth and become larger, enterprises take a lot of debt. If growth slows down and profit decreases, it can cause enterprises unable to pay their obligations which can trigger a series of events that can lead to insolvency. Sales decline is an undesirable scenario for enterprises while sales growth is beneficial. However, even though sales growth is important, at the same time it can be dangerous if it pushes enterprises into insolvency. Therefore, enterprises need to keep their leverage and cash under control. High leverage as well as insufficient cash collecting can push enterprises to miss payments on their debt which can lead to insolvency.

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In contrast to the extensive literature examining the correlation between financial indicators and both growth and insolvency, there exists a research gap concerning the relationship between growth and insolvency itself. Bonaccorsi di Patti et al. (2015) showed that the drop in sales in combination with the high firm leverage increases the probability of default which reduces the resilience of the firms. Xuezhou et al. (2022) claimed that growth indirectly impacts insolvency risk through leverage decisions. The effect of sales growth on insolvency also depends on liquidity – if liquidity is higher with the same level of sales, the probability of insolvency should be lower. Xuezhou et al. (2022) reported a positive effect of liquidity on insolvency risk finding that the firms that possess more liquid assets experience less financial distress. They also argue that the influence of growth on insolvency is channeled through the availability of financial resources while pursuing growth. If a firm has good liquidity and can fulfill its short-term obligations, it will be less exposed to insolvency risk (Goel et al., 2015).

The main goal of the research presented in this paper is to investigate both, growth and insolvency together. To accomplish the main goal, the following research questions have been examined:

- Does the ratio of solvent and insolvent enterprises change according to sales growth levels? What stage of growth is risky?

- Do financial indicators in growing and solvent enterprises differ from non-growing and insolvent SMEs?

- Which financial indicators are important for predicting insolvency? Is growth an important predictor of insolvency?

We utilize a dataset of financial statements from SMEs in Croatia to empirically test our research questions. The Croatian economy is a transitional economy, whose macroeconomic performance started to improve in 2000, with GDP growth of 4-6 percent, mostly driven by the recovery of tourism and credit-driven consumption. Over the same period, inflation remained relatively at a low level and currency stable. On 1st July 2013, Croatia joined the EU, and 10 years later, on 1st January 2023 joined the Eurozone and the Schengen Area. Croatia ended 2021 with a GDP level of 58.2007 bn. EUR. As for the national economic structure, using composition criteria, GDP consists of agriculture (4 percent), industry (26 percent), and services 70 percent. By the end-use criteria, GDP consists of 60 percent of household consumption, 20 percent of government consumption, and 20 percent of investment in fixed capital. At the end of 2022, there were

1.710 million inhabitants with working capabilities. The rate of employment is estimated at 60.2 percent, while the unemployment rate is around 7.5 percent (Croatian National Bank, 2021). The service sector employs around 70 percent, industries 28 percent, and the rest 2 percent work in agriculture. Public debt as a percentage of GDP, varied between 35.4 percent (2000) and 87 percent (2020), with a constant growth trend. In 2021, it dropped to 78.4 percent of GDP. As for the sources of SME financing, the most common sources are traditional sources of financing, i.e. bank loans and leasing, while other sources of financing, such as business angels, venture capital funds, and crowdfunding platforms, remain underdeveloped. According to the SBA Fact Sheet of the European Commission for 2019, Croatia has the lowest-rated equity funding component and the lowest ranking for financing small and medium enterprises by business angels (SBA Fact Sheet, European Commission, 2019; CEPOR, 2020).

The research questions in this paper should be viewed in the context of the stated facts about macroeconomic conditions in Croatia. Therefore, the results of the research can be beneficial for entrepreneurs, banks, and policymakers operating in similar conditions.

The structure of the paper is the following. After the introduction, there is an overview of previous research, the description of data, variables, and methodology. Results and the interpretation are presented followed by a conclusion and discussion.

Literature Review

There is substantial literature investigating enterprise insolvency. Most of them are oriented toward finding factors that can trigger enterprise insolvency and which can be used for developing insolvency prediction models. Many of the models are composed of financial ratios. Ever since the Altman z-score (Altman, 1968), insolvency prediction models have been composed of financial indicators that cover liquidity, profitability, leverage, solvency, and activity. Chen and Shimerda (1981) reviewed 26 articles that classified 65 financial ratios incorporated in predictive studies between 1966 and 1975. They classified useful ratios into seven factors: Return on Investment, Capital Turnover, Financial Leverage, Short-Term Liquidity, Cash Position, Inventory Turnover, and Receivables Turnover. Besides financial ratios, equity market indicators can also be important for insolvency (Maffett et al., 2017) as well as macroeconomic variables – the GDP growth, share prices, exchange rates, and lending rates (Nkusu, 2011; Beck et al., 2013). Many studies investigate enterprise growth in terms of finding factors

that influence growth. Reasons for that can be found in the fact that growing enterprises make a high contribution to economic growth. Factors that influence growth are usually arranged in three groups: the entrepreneur, the enterprise, and the environment (Wiklund et al., 2009). On the side of the entrepreneur, the most important factors that influence growth are age (Welter, 2001), education (Kolvereid & Bullvag, 1996; Peńa, 2002), experience (Barringer & Jones, 2005), and personality traits such as motivation (Barringer & Jones, 2005; Delmar, 1996), need for achievement (Lau & Busenitz, 2001), self-efficacy (Baum, 1994), degree of risk-taking propensity (Levie & Autio, 2013). Among factors of growth on the side of an enterprise, the most important are age and size (Yasuda, 2005), human capital (Wang & Chang, 2005), level of R&D (Helmers, 2011), innovation (Maldonado-Gonzalo et al., 2018), organizational learning (Hult et al., 2003) and financial structure. Regarding financial indicators, as we have in our research, most of the previous studies investigate financial resources and liquidity measures. Sampagnaro (2013), Jeger et al. (2016), and Simbaña-Taipe et al. (2019) identified internal cash flows as one of the most relevant factors of growth. Sampagnaro (2013), Moreno and Casillas (2007), Honjo and Harada (2006), Chen and Zhao (2006), Becchetti and Trovato (2002) showed that financial resources, especially availability of external finance and internationalization are related to enterprises' growth. Compared to the literature that investigates the association of financial indicators with growth and insolvency, there is a lack of research that explores the connection between growth and insolvency. Patti et al. (2015) investigated the relationship between enterprise insolvency and growth. They showed that the negative impact of sales decrease on enterprise solvency is larger for the enterprises that are highly leveraged compared to the less leveraged enterprises. Bjørn and Næs (2010) investigated the relationship between bankruptcy risk and expected future sales growth. The results showed that financial ratios characterizing enterprises with high bankruptcy risk also characterize enterprises with high future expected growth. Enterprises with a high risk of insolvency are similar to firms with high future sales growth. Hussain et al. (2020) proved a negative relationship between growth opportunities and insolvency risk. Additionally, growth opportunities harm the capital structure while debt maturity was influenced positively. Amaral (2008) confirmed that fast-growing enterprises are also more exposed to failure, which is especially true for smaller enterprises. Some studies haven't shown a significant relationship between growth and insolvency. Putri and Arifin (2019) showed that liquidity, leverage, and institutional ownership have an effect while sales growth does not affect financial distress. Nazaruddin and Daulay (2019) explored the effect of activity, sales growth, and intellectual capital on financial distress in manufacturing enterprises in Indonesia and Malaysia.

The results showed that sales growth did not affect the prediction of financial distress.

Data, Variables, and Methodology

The data sample for this research consists of financial statements and the insolvency status of SMEs in Croatia. From the data set of all SMEs in Croatia, SMEs that were insolvent in 2019 are selected. Among all solvent SMEs, the same number of 3207 was selected randomly. Financial indicators for 2018 and variables indicating sales growth/decline comparing 2019 and 2018 are calculated. After data cleansing, the final sample consisted of 4271 SMEs for which the data about insolvency and growth were available. An SME is defined as insolvent if it failed to fulfill its obligations for more than 90 days at least once during 2019. Sales growth is calculated in the following way (sales2019-sales2018)/sales2018. Since one of our research issues is to discover what stage of growth is risky, we categorized sales growth in the following way: (i) sales growth>2; (ii) 0.4<sales growth≤2; (iii) 0.13<sales growth≤0.4; (iv) 0<sales growth≤0.13; (v) -0.3<sales growth≤0; (vi) -0.7<sales growth≤-0.3; (vii) -1<sales growth≤-0.7; (viii) sales growth≤-1.

16 financial indicators covering profitability, liquidity, leverage, activity, productivity, and efficacy are calculated for each SME. Their formulas and descriptions are shown in Table 1.

To investigate the dependence of enterprises' solvency/insolvency with sales growth/decline as well as with different sales growth levels, the χ^2 test is used. Results are presented in Tables 2 and 3. To investigate differences in distributions of financial indicators considering (non)growth and (in)solvency – growing and solvent, non-growing and solvent, growing and insolvent, and non-growing and insolvent, Kruskal-Wallis ANOVA is used (Table 4). Logistic regression is used to develop a model for predicting enterprise insolvency. Results are presented in Table 6.

The reasons for using non-parametric tests are dispersed distributions of financial indicators.

When the dependent variable is binomial, logistic regression is used. In modelling insolvency prediction, 1 denotes insolvent enterprise and 0 otherwise. Logistic regression is used to obtain a function that predicts the probability of an enterprise becoming insolvent. The

logistic function, which describes the relationship between dependent and independent variables, is:

$$p = \frac{e^{\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_r x_r}}{1 + e^{\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_r x_r}} \tag{1}$$

p is the probability of the dependent variable being 1, which means insolvent. Regression coefficients β_i, $i=1,2,...,r$, are unknown parameters that need to be estimated. Usual approach for their estimation is logistic transformation:

$$\log it(y) = \ln\frac{p}{1-p} = \ln e^{\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_r x_r} =$$
$$= \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_r x_r = g(x) \tag{2}$$

where $\frac{p}{1-p}$ is called odds and its logarithm is called log odds. With this transformation, a linear function, $g(x)$ is obtained. It needs to be estimated. Since the assumptions of linear regression such as normality and homoscedasticity are not met, least square estimation should be avoided. By denoting y_i to be the realization of the dependent variable, and $x_i' = (1, x_{i,1}, ..., x_{i,r})$ to be observed corresponding r explanatory variables, where $i=1,...n$ and n being the sample size, where $p_i = \frac{e^{g(x_i)}}{1 + e^{g(x_i)}}$, the entire sample likelihood function is conditional on x_i is (Jobson, 2012):

$$L(\beta \mid y) = \prod_{i=1}^{n} p_i^{y_i} (1 - p_i)^{1-y_i} \tag{3}$$

where $\beta = (\beta_0, \beta_1, ..., \beta_r)$. The logarithm is used to obtain a more manageable form:

$$\ln L(\beta \mid y) = \ln \prod_{i=1}^{n} p_i^{y_i} (1 - p_i)^{1-y_i} =$$
$$= \sum_{i=1}^{n} \ln p_i^{y_i} (1 - p_i)^{1-y_i} \tag{4}$$
$$= \sum_{i=1}^{n} \left[y_i \ln p_i^{y_i} + (1 - y_i) \ln(1 - p_i) \right]$$

To estimate β, (4) is maximized through partial differentiation. The solution is obtained using iterative processes (Czepiel, 2002).

Results

The main motivation for this research is to deepen understanding of the relationship between growth and insolvency. In Table 2, solvency/insolvency and sales growth/decline are crossed for our sample.

From Table 2 it can be noticed that among all SMEs with sales growth, there are 70.37 percent solvent and 29.63 percent insolvent SMEs while among all with sales decline there are 38.96 percent solvent and 61.06 percent insolvent. Also, of all solvent SMEs, 57.44 percent have sales growth and 42.56 percent have a decrease in sales while of all insolvent SMEs, the percentage of those with sales growth is 26.6 percent and with sales decline 73.4 percent. There is a dependence between insolvency and sales growth ($\chi 2 = 414.13$; $p < 0.001$) – most SMEs with sales growth are solvent but, it can also be noticed that 30 percent of such SMEs are at the same time insolvent. These data show that it makes sense to investigate this relationship. We will get an even better insight into the issue if we look at Table 3, where insolvency is crossed with different levels of sales growth.

Table 2
Insolvency/solvency and sales growth/decline for SMEs in the sample

		Sales growth	Sales decline	Total
Solvent	% column	70.37%	38.94%	2237 52.38%
	% row	57.44%	42.56%	
Insolvent	% column	29.63%	61.06%	2034 47.62%
	% row	26.60%	73.40%	
Total		1826 42.75%	2445 57.25%	4271 100%

Source: The authors

In Table 3, the dependence between insolvency and sales growth has been confirmed ($\chi 2 = 790.38$; $p < 0.001$). It can be seen that in all positive stages of sales growth, there are more solvent SMEs (between 60 percent and 75 percent) than insolvent (between 25 percent and 40 percent), and where there is a decrease in sales, it is quite the opposite – there are more insolvent (between 65 percent and 80 percent) than solvent SMEs (between 20 percent and 35 percent). However, it seems significant that if we compare percentages related to only positive stages of sales growth (sales growth>0), we can notice that the highest percentage of insolvent SMEs is where the sales growth is greater than 2 which is the highest growth. So, among all SMEs with sales growth over 200 percent, 36.56 percent of SMEs were insolvent in the next period. It confirms our statement of how high growth can be at the same time high risk.

In the next phase of our research, the aim is to investigate financial indicators according to insolvency and growth. Do the values of financial indicators in growing and solvent SMEs differ from non-growing and insolvent SMEs? A

Table 3

Insolvency and different stages of sales growth for SMEs in the sample

		Solvent	Insolvent	Total
sales growth>2	% solvent	7.91	5.01	6.53
	% sales growth	63.44	36.56	
0.4<sales growth≤2	% solvent	15.15	7.33	11.43
		69.47	30.53	
0.13<sales growth≤0.4	% solvent	16.97	6.19	11.82
	% sales growth	75.05	24.95	
0<sales growth≤0.13	% solvent	16.32	6.24	11.52
	% sales growth	74.19	25.81	
-0.3<sales growth≤0	% solvent	25.70	17.40	21.75
	% sales growth	61.89	38.11	
-0.7<sales growth≤-0.3	% solvent	8.85	18.73	13.56
	% sales growth	34.20	65.80	
-1<sales growth≤-0.7	% solvent	5.14	19.22	11.85
	% sales growth	22.73	77.27	
sales growth≤-1	% solvent	3.98	19.86	11.54
	% sales growth	18.05	81.95	
		52.38	47.62	100

Source: The authors

comparison between financial indicators for growing and non-growing SMEs shows that differences exist in all financial indicators. SMEs with sales growth showed better financial performance compared to SMEs that had no sales growth. The same pattern exists when differentiating between solvent and insolvent SMEs. SMEs with better financial indicators have higher odds of being solvent in the next period. To additionally investigate the relationship between insolvency and growth, we divided our sample into 4 groups of SMEs: (i) SMEs that are solvent and growing (30.1 percent); (ii) SMEs that are solvent and non-growing (22.2 percent); (iii) SMEs that are insolvent and growing (12.7 percent); (iv) SMEs that are insolvent and non-growing (35 percent). Financial indicators are compared according to these groups. Results are presented in Table 4.

From Table 4 it can be noticed that differences exist in all financial indicators according to the (non)growth and (in) solvency. Overall, it can be noticed that better indicators exist with solvent and growing SMEs than with insolvent and non-growing. SMEs with better indicators have higher chances to be solvent and grow in the future as opposed to SMEs with poor financial indicators. Additionally, results show that somewhat poorer financial indicators are present in SMEs that are insolvent and growing compared to those that are solvent and non-growing. Regarding profitability, there is a noticeable difference in profitability between growing-solvent and non-growing-insolvent. SMEs with high profitability indicators have much higher chances of being solvent and growing in the future period than those with very low or even negative profitability. It is interesting to notice a negative return on equity in growing insolvent SMEs. Despite negative ROE, SMEs can accomplish growth, probably due to high leverage but it ends in insolvency. Higher liquidity measures can be observed in growing-solvent and non-growing-solvent compared to growing-insolvent and non-growing insolvent SMEs. It suggests that liquidity is more important for ensuring solvency than for accomplishing growth. More favorable leverage indicators can be observed in growing-solvent and non-growing-solvent compared to growing-insolvent and non-growing-insolvent. We can notice that growing-solvent SMEs have higher values of debt equity and debt to EBITDA ratios compared to non-growing solvent SMEs, which means that they are more leveraged. It seems they used more debt to finance their growth and at the same time managed to stay solvent. However, it is important to emphasize that debts are not allowed to be too high nor EBIT negative because it leads to insolvency. The worst activity ratios are present in non-growing-solvent SMEs. It is worth noticing that total assets

Table 4

Differences in financial indicators according to growth/non-growth and solvent/insolvent

growth/solvency*	Me (IQR)				H (p)**
	GR-SOL	NONGR-SOL	GR-INSOL	NONGR-INSOL	
Efficiency indicators					
EF_TB	1.05 (0.15)	1.01 (0.26)	1 (0.31)	0.74 (0.81)	757.9 (<.001)
Profitability ratios					
P_ROA	6.75 (20.44)	0.9 (15.2)	0.4 (32.67)	-7.43 (78.93)	779.7 (<.001)
P_ROE	17.9 (46.57)	1.06 (39.16)	-3.87 (62.52)	-10.77 (65.76)	660.8 (<.001)
P_PM	4.22 (11.35)	1.21 (21.87)	0.76 (32.34)	-21.63 (142.9)	568.8 (<.001)
Liquidity ratios					
L_CR	1.49 (2.37)	1.41 (3.14)	0.76 (1.39)	0.75 (1.75)	270.9 (<.001)
L_QR	1.18 (2.31)	1.1 (2.75)	0.5 (1.23)	0.51 (1.56)	217.2 (<.001)
L_CDR	0.15 (0.65)	0.08 (0.47)	0.009 (0.11)	0.004 (0.09)	584.4 (<.001)
Leverage ratios					
D_TDR	0.62 (0.61)	0.64 (0.77)	1 (1.55)	1.01 (2.91)	310.3 (<.001)
D_DER	0.65 (2.4)	0.31 (2.67)	-1 (3.44)	-1 (2.21)	248.7 (<.001)
D_LA	0.13 (0.46)	0.14 (0.57)	0.16 (0.91)	0.15 (1.05)	20.2 (<.001)
D_DEB	2.22 (6.69)	0.89 (8.22)	1.39 (14.69)	-1.13 (11.54)	461.6 (<.001)
Activity ratios					
A_TAT	1.73 (2.23)	0.97 (1.76)	1.33 (3.91)	0.43 (1.74)	400.8 (<.001)
A_DSO	43 (71)	62 (139)	56 (203)	139 (456)	222.6 (<.001)
A_DPO	41 (75)	60 (158)	122 (368)	200 (838)	404.7 (<.001)
A_WC	1.96 (7.25)	0.42 (3.52)	-0.11 (3.97)	0 (0.67)	196.8 (<.001)
Productivity ratios					
PR_S	299794 (443212)	243806 (343966)	184850 (280620)	104785 (210566)	385.5 (<.001)

Source: The authors
* GR-SOL – growing and solvent; NONG-SOL – non-growing and solvent; GR-INS – growing and insolvent; NONG-INS – non-growing and insolvent ** Kruskal-Wallis test

turnover and days sales outstanding are better in growing insolvent than in non-growing insolvent. This could mean that better turnover and faster collection of receivables are more important for growth than for solvency. Regarding productivity measures – higher productivity means higher odds for growth and solvency.

Finally, if we want to predict whether an enterprise will be insolvent in the next period, we would like to investigate if sales growth is a significant predictor of insolvency. To realize that, we developed a model for insolvency prediction. Our data set is divided into development and validation samples. The structure is presented in Table 5.

Table 5

Development and validation sample for insolvency prediction model

Enterprise	Development sample	Validation sample	Total
Solvent	1442	592	2034
Insolvent	1549	688	2237
Total	2991	1280	4271

Source: The authors

In our model, it can be noticed that the probability of insolvency is increased with the increase of the debt-equity ratio. On the other side, an increase in total asset turnover as well as return on assets will decrease the probability of insolvency. Increasing the equity ratio by 1, the odds ratio for insolvency will increase by 1.001 (e0.00128). Also, the odds ratio for insolvency will be decreased by 0.59 (e-0.5257) by increasing total asset turnover by 1. Unit increase of return on assets decreases the odds ratio of insolvency by 1 (e-0.000015). By reviewing the estimated logistic regression coefficient of sales growth, it can be noticed that the worst stage regarding insolvency is 'sales growth⩽-1' and the best '0<sales growth⩽0.13'. The odds ratio for insolvency of an enterprise having a sales decline of 1 or more compared with an enterprise with sales growth of more than 2 will increase by 7.6 (e2.03). If we compare sales decline '-0.7<sales growth⩽-0.3' with the reference category 'sales growth>2', we also see an increase of 5.75 (e1.7491). The same increasing trend of odds ratio for insolvency related to reference category of growth 'sales growth>2' applies for categories with sales decline '-0.7<sales growth⩽-0.3' and '-0.3<sales growth⩽0'. But, for the rest, the trend is changing – the odds ratio for insolvency is decreasing. The odds ratio for insolvency of an enterprise having sales up to 0.13 compared with an enterprise with sales growth of more than 2 will decrease by 0.55 (e-0.5968). In other words, the odds ratio for solvency will increase by 1.81 (1/0.55). If we compare sales growth in the range '0.13<sales growth⩽0.4' with reference category 'sales growth>2', we also see a decrease of 0.57 (e-0.5671) or an increase of odds ratio for solvency by 1.75 (1/0.57). Sales growth between 0.4 and 2 compared to 'sales growth>2' will increase the odds ratio for

insolvency by 1.4. The model shows that a decline in sales is riskier than an increase in sales. However, too much sales growth is also risky. An enterprise with a sales growth of over 2 has a greater chance of insolvency compared with an enterprise with a sales growth of less than 2. The least risky are enterprises with sales growth of up to 0.13. It should be noticed that of all growth stages, the one with the highest growth, over 2, is the riskiest.

The results of the model testing performed on the validation sample are as follows: the area under the curve is 0.736, the GINI coefficient is 0.47, the insolvency-hit rate is 62.3 percent and the solvency hit rate is 76.5 percent.

Discussion and Conclusion

Sales are the driving force behind any business. Every aspect of enterprise operations, such as employees, equity, assets, inventory, and way of financing are determined by future sales. Sales decline as well as excessive sales growth can push enterprises toward insolvency. When enterprises take a lot of debt to accomplish desired growth, sometimes it can cause a situation where earnings are not enough to cover the debt.

In this paper, we investigated the relationship between sales growth and insolvency by analyzing three issues. The first issue analyzed in our research is the ratio of solvent and insolvent SMEs according to the sales growth levels. Our research showed that 70 percent of SMEs with sales growth are solvent and 30 percent are insolvent while 39 percent

Table 6

Results of logistic regression model for insolvency prediction

Variable	Estimate	Lower CL 95%	Upper CL 95%	p
Total asset turnover	-0.5257	-0.0033	-0.0002	0.0205
ROA	-0.000015	-0.00002	-0.000006	0.0015
Debt equity ratio	0.00128	0.0004	0.0021	0.0037
sales growth⩽-1	2.0300	1.6185	2.4415	0.0000
-1<sales growth⩽-0.7	1.7491	1.3562	2.1418	0.0000
-0.7<sales growth⩽-0.3	1.1882	0.8246	1.5517	0.0000
-0.3<sales growth⩽0	0.0272	-0.3132	0.3675	0.8756
0<sales growth⩽0.13	-0.5969	-0.9868	-0.2068	0.0027
0.13<sales growth⩽0.4	-0.5671	-0.9522	-0.1819	0.0039
0.4<sales growth⩽2	-0.3494	-0.7300	0.0313	0.0720
sales growth>2	0.0000			

Source: The authors

of SMEs with sales decline are solvent and 61 percent are insolvent. If we analyze SMEs with different levels of sales growth, the highest percentage of insolvent SMEs is where the sales growth is over 200 percent. Among all SMEs with sales growth over 200 percent, 36.56 percent of SMEs were insolvent in the next period. It can be concluded that high growth can be at the same time high risk. The second issue analyzed in our research refers to the investigation of the values of financial indicators according to 4 groups of SMEs: (i) SMEs that are solvent and growing; (ii) SMEs that are solvent and non-growing; (iii) SMEs that are insolvent and growing; (iv) SMEs that are insolvent and non-growing. Better indicators exist with solvent and growing SMEs than with insolvent and non-growing. SMEs with better indicators have higher chances to be solvent and grow in the future as opposed to SMEs with poor financial indicators. Results have also shown that somewhat better financial indicators exist among solvent and non-growing than in insolvent and growing. SMEs with high profitability indicators have much higher chances of being solvent and growing in the future period than those with very low or even negative profitability. More favorable leverage indicators can be observed in growing-solvent and non-growing-solvent compared to growing-insolvent and non-growing-insolvent. Lower liquidity measures are observed in growing insolvent and non-growing insolvent SMEs while better measures of liquidity are more related to solvent SMEs both growing and non-growing. It suggests that liquidity is more important for ensuring solvency than for accomplishing growth. Activity ratios showed somewhat different patterns. The worst activity ratios are present in non-growing insolvent and non-growing solvent SMEs. It suggests that activity ratios are more important for ensuring growth than for solvency. The third issue analyzed in our research is related to finding important predictors of insolvency. Because financial indicators were calculated a year before insolvency is measured, it can be concluded that a certain level of financial indicators can have an impact on whether the SME would be solvent or insolvent in the next period. The logistic regression model revealed that important predictors of insolvency for Croatian SMEs are total asset turnover, return on assets, debt-equity ratio, and sales growth. The probability of insolvency is increased with the increase in debt-equity ratio and decrease in return on assets and total asset turnover. The model shows that a decline in sales is riskier than an increase in sales. However, too much sales growth is also risky. An enterprise with a sales growth of over 200 percent has a greater chance of insolvency compared with an enterprise with a sales growth of less than 200 percent. The least risky are enterprises with sales growth of up to 13 percent. It should be noticed that of all growth stages, the one with the highest growth, over 200 percent, is the riskiest.

The results of our research are in line with some previous research that showed the positive impact of sales growth on enterprise solvency (Patti et al., 2015; Hussain et al., 2020) but also those that emphasized how high growth can be at the same time high risk (Bjørn & Næs, 2010; Amaral, 2008).

This research has implications for entrepreneurs, banks, and policymakers. Entrepreneurs must strive to ensure sales growth, but they must keep that growth under control so that it does not lead them into insolvency. Banks and investors should pay attention to sales growth when assessing risk, in addition to all other elements they take into analysis. Enterprises that manage to ensure sales growth are less risky. Policymakers should create programs by which they support growing SMEs because they are less risky and can contribute to the economic development of the country.

The limitation of the research is the analyzed variables that include only financial indicators, given that previous research has shown that growth and insolvency are also affected by non-financial characteristics.

As a guideline for future research, we plan to include additional characteristics in the analysis because previous research has shown that growth and insolvency are also affected by non-financial characteristics.

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Kakšna je povezava med rastjo prodaje in tveganjem plačilne nesposobnosti?

Izvleček

Rast prodaje je bistvenega pomena za preživetje in finančno rast podjetij. Če podjetjem uspe doseči rast prodaje, lahko dosežejo širitev celotnega podjetja. Vendar ali ima vedno le pozitivne učinke? Če podjetje ne zbere dovolj gotovine, lahko to povzroči, da zamudi plačilo dolga, kar sproži vrsto dogodkov, ki lahko pripeljejo do njegove plačilne nesposobnosti. Cilj tega prispevka je raziskati razmerje med rastjo prodaje in plačilno nesposobnostjo. Povezava je empirično preverjena na podatkovnem nizu 4271 malih in srednje velikih podjetij na Hrvaškem. Rezultati so potrdili, da obstaja povezava med rastjo prodaje in plačilno nesposobnostjo. Boljši kazalniki obstajajo pri solventnih in rastočih MSP kot pri insolventnih in nerastočih. Rezultati so pokazali tudi, da je lahko visoka rast hkrati tudi visoko tveganje. Članek prispeva k globljemu razumevanju razmerja med rastjo in plačilno nesposobnostjo ter empirično dokazuje, da rast prodaje nad 200 % na leto povzroča največjo verjetnost plačilne nesposobnosti v primerjavi z drugimi nižjimi stopnjami rasti.

Ključne besede: rast MSP, tveganje plačilne nesposobnosti, rast prodaje, finančni kazalniki, preprečevanje plačilne nesposobnosti, stečaj