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Does Innovation Matter for SMEs' growth in Croatia?

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Abstract

Small and medium sized enterprises (SMEs) account for about 99% of all enterprises in Croatia as well as in the EU economy. In most industries, SMEs attribute to much of the capital stock, employment, and a significant fraction of innovations. Among all SMEs, those that are growth-oriented make the most tangible contribution to economic growth. This is the reason why it is especially important to understand how SMEs grow. Numerous research studies are devoted to investigating factors related to growth. They have usually been understood in terms of three main categories: the entrepreneur, the enterprise and the environment. Among factors of growth on the side of the enterprise, one that is frequently reported in articles is innovation. However, the question is whether innovation necessarily leads to growth. The aim of this research is to investigate the relationship between high growth and innovation. Dataset for this research consists of 181 SMEs from Croatia. Empirical analysis in this research has been conducted in four stages. In the first stage, SMEs that have come out as innovative are compared with SMEs that are not innovative. Differences exist in human capital, profitability, exports, market and strategic orientation, novelty of technology and products. The second stage included comparison between growing SMEs and non-growing SMEs. Growing SMEs are younger, invest less in long-term assets and have lower barriers regarding capital availability. Also, they use newer technologies and they are more financed from internal resources. Comparison between growing SMEs that have come out as innovative and growing SMEs that have not come out as innovative shows differences in novelty of products and technology used, exports and aspiration for growth of employees. The final stage of the research covered development of a model for growth estimation by using factor analysis and logistic regression in order to estimate probability of an SME achieving growth and to identify factors that influence growth. It has been shown that the variable indicating existence of innovation in the enterprise is not present among factors that influence growth. This research raises the question of understanding innovations, as well as what types of innovative enterprises really exist in Croatia.

Keywords*: high growth, high growth estimation, high growth SMEs, innovation, logistic regression*

Track: *Entrepreneurship*

Word count: *7.452*

1. Introduction

Innovativeness of enterprises is an increasingly interesting topic considering the accelerating development of technologies. Innovation is seen as the core capability of an enterprise, and it

doesn't involve only new products, but also business processes and building new markets to meet customer needs (Laforet, 2010). The question is, what differentiates innovative from non-innovative enterprises. Previous studies show that innovativeness is related to investment in human capital (Kuraś, 2014), market orientation (Kero and Sogbossi, 2017), consumer and competitor orientation intensity (Božić, 2006), and exports (Begonja *et al.*, 2016). Based on previous research, in our first hypothesis we want to test differences between innovative and non-innovative SMEs in Croatia. Compared to non-innovative SMEs, we expect that innovative SMEs invest more in human capital, use newer technology, have higher exports, are more oriented to fulfilling market needs and are more profitable. The key question is why innovativeness is actually important, i.e., what does innovation lead to, what is the consequence of innovativeness. According to some studies, innovativeness is one of the key determinants of enterprise growth (Mason, Bishop and Robinson, 2009; Subrahmanya, Mathirajan and Krishnaswamy, 2010; European Commission, 2010; Coad, Segarra and Teruel, 2015; Love and Roper 2015). But, there are others that find innovation has no significant impact on growth (Almus and Nerlinger, 1999; Bottazzi *et al.*, 2001; Grundström *et al.*, 2012) and some revealing a negative relation between innovation and growth (Demirel and Mazzucato, 2013). Enterprise growth is considered a key driver of competitiveness, employment and economic development. From the theoretical standpoint, enterprise growth is determined by entrepreneur-level, enterprise-level and environment-level factors. In terms of characteristics of an entrepreneur, willingness to take risks, mid-management experience (Cassia, Cogliati and Paleari, 2009), education and entrepreneur's aspiration to grow (Kolvereid and Bullvag, 1996) have been shown as determinants of growth. On the enterprise level, besides innovation, age and size of an enterprise, strategic orientation (Morone and Testa, 2008; Barringer, Jones and Neubaum, 2005; Freel and Robson, 2004), financial structure and productivity (Mateev and Anastasov, 2010) are shown to positively influence potential for growth. Based on previous research, in the second hypothesis we want to test the differences between growing SMEs and non-growing SMEs. We expect that growing SMEs are younger, innovative, focused on growth, competition and on fulfilling market needs, and are owned by skilled entrepreneurs with willingness to take risks. In the third hypothesis we expect to prove that innovativeness is one of the key determinants of SMEs growth.

In order to further investigate the characteristics of innovative growing SMEs, in our fourth hypothesis, we compared growing SMEs that have come out as innovative and growing SMEs that have not come out as innovative. Some previous studies show that growing innovative SMEs are more constrained by management skills (Hughes, 2000) and have higher exports (Lou and Beamish, 2006. Baldwin and Gellatly (2006) show that such SMEs invest more in human capital, place greater weight on R&D, technology, product development and are more oriented towards management and marketing. In our research, we expect that growing innovative SMEs have higher exports, invest more in human capital and R&D. They are more focused on growth, competition and fulfilling the market needs. Compared to non-innovative growing SMEs, we expect that innovative SMEs have unique products and use newer technology.

The structure of the paper proceeds as follows. The next section displays the previous research on innovation and growth of SMEs. Section 3 is devoted to research methodology, with subsections related to data and variables, and methods applied in the study. Results of the analysis are presented in Section 4, while Section 5 contains discussion, conclusion and implications for further research.

2. Previous research

Question of enterprise growth is one of the central issues of entrepreneurship research, alongside innovation and venture creation (Delmar, 2006). Enterprise growth is associated with specific enterprise characteristics, behaviors, strategies and decisions (Delmar, 2006). Determinants of enterprise growth have usually been collocated in three categories: the entrepreneur, the enterprise and the environment. Among factors of growth on the side of the enterprise, one frequently reported in articles is innovation. Furthermore, success of a few well-known high-tech enterprises has indicated innovation as a key determinant of their growth. Helmers and Rogers (2011) and McGee and Dowling (1994) confirmed that the capacity to invest in R&D seems to be one of the most important determinants, and Fischer *et al.* (1997) emphasized the importance of innovation for achieving growth. Coad and Rao (2007) emphasized the complexity of observing the link between innovation and growth. The first obstacle, they find, is how to define the variable which would describe an enterprise's innovativeness. Further, they observe complications in binding innovation data with other enterprise characteristics. In linking innovativeness to high growth they report problems because of the lag in the time it takes an innovation to produce growth in sales. Results of their study implicate a positive relationship of innovation to growth in sales but only for high growth enterprises, as they didn't find any significant link for average growing enterprises. Demirel *et al.* (2013) observed small and large pharmaceutical enterprises through three variables that presented innovation – the effect of R&D, depending on whether they are patentees (enterprises that have at least one patent) and whether they are persistent patentees (enterprises that have patented for at least five consecutive years). For small enterprises that are either patentees or persistent patentees, R&D has a positive effect on growth, but there is no significant relation if they are not patentees. Interestingly, R&D will have a negative effect if a small enterprise is not a persistent patentee. Even more surprising is that they found that for large enterprises R&D has a significant and negative impact on sales growth regardless of whether they patent persistently or non-persistently. For large enterprises, they didn't find a statistically significant relationship between R&D and growth if they are non-patentees. Innovation is often linked to other characteristics, for example, Love *et al.* (2015) observe innovation and export. Although they detect a positive relationship between high growth and innovation, they debate that innovation without internationalization and export does not seem to provide substantial performance benefits. This is in line with the 2010 final report on Internationalization of European SMEs, where data suggests that SMEs grow twice as fast if they export and that internationally active SMEs are three times more likely to introduce innovative products or services. Approximately half of internationally active SMEs in Europe are also innovative (European Commission, 2010). To clarify the effect of innovation on the performance of enterprises, there are studies that differentiate the effect of innovation depending on the type of enterprise. Some were researching the difference in relations between innovation and growth in-between slow and fast growing enterprises, low-tech and high-tech industries, and young vs. older enterprises. Stam and Wennberg (2009) research implied that R&D is important for the growth of high-tech firms, while growth ambitions are for the growth of low-tech firms. Studies by Hölzl (2009), Mason *et al.* (2009) and Grundström *et al.* (2012) all concluded that innovative firms have tendencies to grow faster than non-innovative firms. Coad *et al.* (2015) found that for young firms R&D shows an increasing influence, while for old firms R&D shows a stable or perhaps decreasing effect. Mazzucato and Parris (2013) researched growth of firms in

competitive environments. Their conclusion is that in such times enterprises either grow or die, and if they want to grow, innovation is the way to go.

In addition to innovation, numerous research studies are devoted to investigating other factors related to growth. The category of the entrepreneur includes traits of the founder or owner, as well as the CEO. According to studies, level of education (Kolvereid *et al.*, 1996; Pena, 2002), industry experience (Klepper, 2001), motivation for growth (Kolvereid *et al.*, 1996; Delmar, 1996; Pena, 2002), need for achievement (Levie and Autio, 2013; Lau and Busenitz, 2001) and self-efficacy (Baum, 1994), have a positive relation to growth. Also, male, as opposed to female, entrepreneurs have a higher probability to own high growth enterprises (Cooper, Gimeno-Gascon and Woo, 1994). As for the age of entrepreneurs, it showed a negative relation (Welter, 2001). Risk taking propensity either showed to have a positive relationship with high growth (Cassia *et al*., 2009; Levie *et al.*, 2013) or no significant relationship could be proved (Palich and Bagbay, 1995). Social skill proved to be significant in the performance of new ventures (Baron and Tang, 2009). Related to the enterprises' characteristics, many studies show that age is in a negative relationship to high growth (Yasuda, 2005; Geroski and Gugler, 2004), while size is either negatively correlated to growth (Yasuda, 2005; Bottazzi, Secchi, 2003), or doesn't show any relationship to growth, which is in accordance with Gibrat's law. Pena (2002) showed a positive link between firm performance and organizational capital. Organizational learning was emphasized by Hult, Snow and Kandemir (2003) and Wiklund, Shepard and Patzelt (2009) emphasized entrepreneurial orientation. External financing shows contradictory results, lower availability could stimulate high growth (Moreno and Casillas, 2007), or higher availability could enable enterprises to achieve high growth (Becchetti and Trovato, 2002; Storey, 1994; Cooper *et al.*, 1994). Similarly, Sampagnaro (2013) states that there is a tendency of external financing resources to negatively affect growth, but research from Storey (1994) and Cooper *et al.* (1994) concluded that there is a positive effect of external resources on SMEs growth. The environment is usually observed through barriers which hinder growth. These include financial barriers (Becchetti *et al*., 2002), technological, institutional (Davidsson and Henreksson, 2002), market and organizational barriers (Bartlett and Bukvic, 2001). Wiklund *et al*. (2009) speak of three types of environment, environmental heterogeneity, which encourages growth, the dynamic environment, which gives the opportunity to grow, and the hostile environment, which makes it difficult to grow.

3. Methodology

3.1. Data and variables

The dataset used in this paper consisted of 181 SMEs, for which both primary and secondary data sources existed. The secondary data consists of financial statements provided by the Croatian Financial Agency FINA for the period 2012-2015. Based on these statements, financial ratios, as well as whether an SME is growing or not, are calculated. Groups of financial ratios included in the analysis cover R&D, investments, liquidity, export, turnover, capital structure and profitability. An SME is defined as growing if it has an average annualized growth in sales greater than 10% a year, two years in a row. There are 59 growing and 122 non-growing SMEs in the dataset. The dataset was divided into 5 subsamples for cross-validation, keeping the ratio of high growth SMEs vs. non-high growth SMEs as close as possible to the initial 59:122 ratio. The primary dataset was generated by polling owners of small and medium-sized enterprises in 2015. The questionnaire used for that purpose was adapted from Zhou and Wit (2009). It

consisted of 115 questions, which were created based on previous research findings of relevant determinants of enterprise growth. In order to create factors that represent theoretical constructs and to reduce the number of variables, factor analysis was applied. Factors and their variables, as well as their respective Cronbach alphas, can be found in Table 1. The questions that were not used in factors are related to the basic demography of entrepreneurs and SMEs, innovativeness, aspirations for growth, human capital and novelty of products and technology. SMEs are defined as innovative if they are in early stages of implementation of innovation or are already experienced innovators or have any product or service declared as an intellectual property. There are 107 innovative and 73 non-innovative SMEs in the dataset (one missing). Among 59 growing SMEs, there are 34 innovative and 25 non-innovative SMEs.

Table 1: Obtained factors and their respective Cronbach alphas

Factors	Variables/Questions from the questionnaire	Cronbach alpha
Entrepreneur		
Skills	Organizational skills; Strategic thinking; Decision-making;	0.6705
Experience	Total years of working experience; Years of experience in the branch; Years of experience in entrepreneurship; Years of experience in the enterprise;	0.8587
Risk taking propensity	Like gambling; Taking actions even if they involve risk; Readiness to take risks;	0.7321
Enterprise		
Focus on growth	Tasks are ended in agreed deadlines; Preparedness for SME's growth; Awareness of all employees to support growth; All employees are goal and growth-oriented; Presence of a strong team spirit; Learning from own mistakes; Successful and unsuccessful business activities are studied and discussed;	0.8594
Competition	The market share is affected by strong competition; The market is characterized by strong competition; Increased competition is a threat;	0.8258
Factors	Variables/Questions from the questionnaire	Cronbach alpha

Fulfilling market needs	Customers' satisfaction is measured structurally and periodically; Competition is analysed and discussed; Customers' needs and wishes are internally shared; Internal procedures and rules are focused on satisfying market needs; Customers' needs are being anticipated and actions towards them are taken accordingly; There is a focus on attracting new customers with new needs; Market segmentation is regularly carried out;	0.8147
Environment		
Macro economic barrier	The intensity of the following barriers to growth: administrative barriers; lack of state support; economic policy of the state; business environment; work law; tax policy; corruption;	0.8778
Market barriers	The intensity of the following barriers to growth: access to new markets; following up on technological progress; problems with inventory and supply; availability of knowledge/technology; possibility of networking; available managerial skills; problems in implementation of new technology;	0.8409
Capital availability barriers	The intensity of the following barriers to growth: lack of support from banks; cost of capital; availability of capital;	0.8519
Market dynamics	Customers are constantly looking for new products and services; Products and services on the market are quickly outdated; Technology needs to be constantly updated; The most significant market is growing rapidly;	0.7172

3.2. Methods

Elementary statistics considering means and standard deviations were calculated for continuous variables. Categorical variables were presented with frequency tables and crosstables. Due to the fact that variables were not normally distributed and some samples were small, nonparametric tests were used. For testing differences in distributions for two variables, the Mann-Whitney test was used. χ^2 and Fisher exact tests were used for testing dependence between two categorical variables.

For the purpose of developing a model for growth estimation, logistic regression is used. As a preprocessing method, factor analysis is used in order to reduce the number of variables by creating factors which would represent theoretical constructs described above.

Independent variables are denoted by X_i, $i = 1,2,\dots,p$, factor analysis has its goal in finding a set of new variables, F_j, ; $j = 1,2,\dots,r$ and U_i , $i = 1,2,\dots,p$, and numbers a_{ij}. Minding that $r < p$, and that the following is valid:

$$X_1 - \mu_1 = a_{11}F_1 + a_{12}F_2 + \cdots + a_{1r}F_r + U_1$$
$$X_2 - \mu_2 = a_{21}F_1 + a_{22}F_2 + \cdots + a_{2r}F_r + U_2$$
$$\vdots$$

$$X_p - \mu_p = a_{p1}F_1 + a_{p2}F_2 + \cdots + a_{pr}F_r + U_p \quad (1)$$

The covariance matrix of the above system is used to calculate common factors F_j, unique factors U_i and factor loadings a_{ij} (Jobson, 1992).

Package psych in R has an inbuilt function fa() which was used to carry out factor analysis.

Logistic regression is used when the dependent variable is binominal, which is the case in our paper. Denoting p to be the probability for an enterprise to become growing and $x_1, x_2, \ldots x_r$ to be the r independent variables, results in the logistic function:

$$p = \frac{e^{\beta_0+\beta_1x_1+\beta_2x_2+\cdots+\beta_rx_r}}{1+e^{\beta_0+\beta_1x_1+\beta_2x_2+\cdots+\beta_rx_r}} \quad (2)$$

The goal is to obtain β_i, $i = 1,2,\ldots.,r$, called regression coefficients. Since the equation (2) is non-linear, logistic transformation is used to simplify further modeling:

$$logit(y) = \ln\frac{p}{1-p} = \ln e^{g(x)} = \beta_0 + \beta_1x_1 + \beta_2x_2 + \cdots + \beta_rx_r \quad (3)$$

where $g(x) = \beta_0 + \beta_1x_1 + \beta_2x_2 + \cdots + \beta_rx_r$. $logit(y)$ is often called 'log odds' (Agresti, 2002).

To get the model, the built-in function glm() in R was used.

For the purpose of testing logistic regression model, the following measures are used: KS or Kolmogorov–Smirnov statistic (Řezáč, 2011), ROC or receiver operating curve, AUC or area under the curve (Fawcett, 2006), Nagelkerke R^2 (Nagelkerke, 1991), AIC or Akaike Information Criterion (Manlove, 2014) and hit rates.

Since the dataset for testing was small, cross-validation is used. In this process, the dataset is divided into n subsamples, and in our case, there were 5 subsamples. Modeling will be done on $n-1$ subsamples, and the obtained model is tested on the remaining subsample, this is repeated n times, so every subsample will be used for testing.

The significance of variables in the model was tested through command anova(model,test="Chisq") in R. It adds one by one variable to the model and tests if it holds significant information through likelihood-ratio Chi-square test (Presnell, 2000).

4. Results

Empirical analysis in this research includes the comparison between innovative and non-innovative SMEs, between growing and non-growing SMEs, followed by the comparison between growing SMEs that have come out as innovative and growing SMEs that are not innovative. The final stage of the research covered the development of a model in order to estimate the probability of an SME to achieve growth and to identify factors that influence growth.

In the first stage of the empirical analysis, SMEs that have come out as innovative are compared with SMEs that are not innovative. The analysis is performed in order to test our first hypothesis, which states that there is a difference between innovative and non-innovative enterprises. Results are given in Table 2.

Table 2: Descriptive statistics and Mann-Whitney test for differences in distributions for innovative vs. non-innovative SMEs

Variable	non-innovative mean (sd)	innovative mean (sd)	p-value

Table 2: Descriptive statistics and Mann-Whitney test for differences in distributions for innovative vs. non-innovative SMEs			
Entrepreneur			
Age	44.52 (10.01)	44.04 (9.78)	0.6831
Number of failed enterprises owned by the entrepreneur	0.123 (0.371)	0.103 (0.335)	0.7056
Skills (F)	0.02 (0.808)	-0.011 (0.905)	0.807
Experience (F)	-0.262 (0.983)	0.184 (0.838)	0.0019 ***
Risk taking propensity (F)	0.169 (0.946)	-0.124 (0.961)	0.0445 **
Enterprise			
Age	14.66 (11.792)	12.45 (12.896)	0.2367
Number of employees	10.78 (18.774)	15.63 (54.567)	0.398
Estimated number of employees in the next 5 years	0.781 (0.712)	2.29 (0.714)	3.63E-29 ***
Focus on growth (F)	-0.248 (1.022)	0.162 (0.85)	0.0055 *
Competition (F)	-0.017 (0.922)	-4.258E-4 (0.957)	0.9095
Fulfilling market needs (F)	-0.183 (0.93)	0.111 (0.876)	0.0347 **
Percentage of employees with highly specialized knowledge	36.36 (36.269)	49.57 (35.035)	0.0163 **
Training hours of employees in the last two years	106 (163.116)	319.4 (1113.427)	0.0557 *
R&D: Intangible assets/ total assets	0.005 (0.03)	0.023 (0.095)	0.0741 *
Investments			
INVESTMENT: Investment in long-term assets/ total assets	0.046 (0.11)	0.055 (0.127)	0.6185
LIQUIDITY: Current assets/current liabilities	1.788 (2.199)	2.288 (4.516)	0.3258
EXPORT: Percentage of customers outside Croatia	13.63 (26.216)	28.79 (34.848)	0.0011***
EXPORT: Exports/total sales	0.049 (0.166)	0.157 (0.301)	0.0025 ***
Variable	non-innovative mean (sd)	innovative mean (sd)	p-value
PRODUCTIVITY: Revenues/number of employees	453800 (1200050.526)	596100 (865863.801)	0.4155
Turnover			
TURNOVER: Revenues/total assets	2.42 (3.341)	2.2 (1.926)	0.6125
CAPITAL STRUCTURE: Liabilities/assets	3.836 (19.333)	0.81 (1.303)	0.186
CAPITAL STRUCTURE: Bank loans/assets	0.11 (0.178)	0.109 (0.157)	0.9427
PROFIT: Net profit margin (%)	5.885 (6.142)	8.749 (11.724)	0.0343 **
PROFIT: Return on equity (%)	33.35 (65.048)	-33.6 (557.239)	0.2211
Environment			

Table 2: Descriptive statistics and Mann-Whitney test for differences in distributions for innovative vs. non-innovative SMEs			
Macroeconomic barriers (F)	0.035 (0.923)	-0.033 (0.962)	0.6368
Market barriers (F)	0.137 (0.913)	-0.098 (0.972)	0.1007
Capital availability barriers (F)	0.06 (1.005)	-0.0425 (0.9)	0.4864
Market dynamics (F)	-0.269 (0.943)	0.196 (0.88)	0.0011 ***
* statistically significant at 10% ** statistically significant at 5% *** statistically significant at 1%			

Entrepreneurs who owned innovative SMEs are more experienced and less willing to take risks. Regarding educational degree, there is no dependence between innovativeness and degree ($p=0.434$). 68.2% innovative and 76.7% non-innovative SMEs are owned by entrepreneurs with a high degree. Regarding differences on the enterprise side, it can be noticed that innovative SMEs have higher growth aspiration, higher investment in human capital and intangible assets and higher exports, as well as profit margin. Also, they are more oriented to fulfilling the needs of the market. Among innovative SMEs, there are 47.6% that perceive themselves as high-tech. The percentage of non-innovative SMEs is 13.9%. The dependence is statistically significant ($p<0.001$). Dependence between innovativeness and novelty of products and technology is found to be significant. There are 19.6% innovative SMEs that have products new to all their customers, while the same percentage for non-innovative SMEs is 8.2% ($p=0.0006$). Additionally, 9.4% innovative SMEs have unique products, while the same percentage for non-innovative SMEs is 0% ($p<0.001$). Regarding the usage of the newest technology, 9.3% innovative SMEs and 0% non-innovative SMEs use technology not older than 1 year ($p=0.014$). Regarding the environment, the analysis showed that innovative SMEs operate on markets that are constantly changing.

By establishing these differences, we can conclude that our first hypothesis, which states that there is a difference between innovative and non-innovative enterprises, has been confirmed.

In order to test our second hypothesis, we compared growing SMEs with non-growing SMEs. Results are given in Table 3.

Table 3: Descriptive statistics and Mann-Whitney test for differences in distributions for growing vs. non-growing SMEs			
Variable	non-growing mean (sd)	growing mean (sd)	p-value
Entrepreneur			
Age	45.61 (10.05)	41.69 (9.15)	0.0138
Number of failed enterprises owned by the entrepreneur	0.148 (0.4)	0.034 (0.183)	0.0094 ***
Skills (F)	-0.012 (0.825)	0.025 (0.943)	0.7967
Experience (F)	-0.015 (0.908)	0.03 (0.956)	0.7626
Risk taking propensity (F)	-0.033 (1.026)	0.069 (0.821)	0.4724
Enterprise			

Table 3: Descriptive statistics and Mann-Whitney test for differences in distributions for growing vs. non-growing SMEs			
Age	14.39 (13.779)	11.36 (8.93)	0.0767 *
Number of employees	16.02 (51.851)	8.593 (15.878)	0.1494
Estimated number of employees in the next 5 years	1.661 (1.061)	1.712 (0.966)	0.7495
Focus on growth (F)	-0.069 (1.001)	0.143 (0.793)	0.126
Competition (F)	0.041 (0.906)	-0.085 (1.018)	0.423
Fulfilling market needs (F)	-0.037 (0.873)	0.077 (0.991)	0.4511
Percentage of employees with highly specialized knowledge	42 (35.016)	47.92 (38.165)	0.3187
Training hours of employees in the last two years	184.9 (525.16)	327.8 (1319.134)	0.4293
R&D: Intangible assets/ total assets	0.02 (0.091)	0.007 (0.023)	0.1281
INVESTMENT: Investment in long-term assets/ total assets	0.062 (0.137)	0.029 (0.07)	0.0338 **
LIQUIDITY: Current assets/current liabilities	1.892 (2.31)	2.489 (5.665)	0.4386
EXPORT: Percentage of customers outside Croatia	22.47 (31.908)	22.69 (33.455)	0.9666
EXPORT: Exports/total sales	0.109 (0.258)	0.119 (0.264)	0.8114
PRODUCTIVITY: Revenues/number of employees	634300 (1211899.875)	332900 (276132.255)	0.0163 **
TURNOVER: Revenues/total assets	2.237 (2.845)	2.383 (1.946)	0.6884
CAPITAL STRUCTURE: Liabilities/assets	2.639 (15.031)	0.764 (0.502)	0.1714
CAPITAL STRUCTURE: Bank loans/assets	0.125 (0.18)	0.075 (0.122)	0.0299 **
PROFIT: Net profit margin (%)	7.901 (9.926)	7.396 (10.535)	0.7584
PROFIT: Return on equity (%)	17.03 (148.792)	-53.62 (725.672)	0.462
Environment			
Macroeconomic barriers (F)	0.03 (0.945)	-0.062 (0.949)	0.5396
Market barriers (F)	-0.037 (0.969)	0.076 (0.916)	0.4505
Capital availability barriers (F)	0.123 (0.928)	-0.254 (0.923)	0.0113 **
Market dynamics (F)	-0.074 (0.949)	0.152 (0.892)	0.1202
* statistically significant at 10% ** statistically significant at 5% *** statistically significant at 1%			

Growing SMEs are younger, they invest less in long-term assets and they are less productive compared to non-growing SMEs. Also, growing SMEs have lower debts to banks, as well as lower barriers concerning capital availability. There is no dependence between innovativeness and growth. Among growing SMEs there are 57.6% which are innovative, while the percentage

for non-growing SMEs is 60.3% (p=0.729). There is a dependence between growth and usage of technology. 4.1% non-growing and 8.6% growing SMEs use the newest technology (p=0.0204). Also, growth is related to having difficulties in financing in the last 3 years. 50.8% non-growing and 27.1% growing SMEs have had problems in financing their business in the last 3 years (p=0.0043). The analysis also showed the role of previous entrepreneurial experience in growth: 50.8% of owners of non-growing SMEs and 24.1% of owners of growing SMEs have previous experience in entrepreneurship (p=0.001).
Of all the differences we anticipated in our second hypothesis, including age, innovativeness, focusing on growth, competition and market, the only difference we have proved is related to the age of SMEs. Thus, our second hypothesis has not been confirmed.
Our third hypothesis is related to the development of a model for growth estimation. Factor analysis and logistic regression are used in order to estimate the probability of an SME to achieve growth and to identify factors that influence growth. Our hypothesis is that innovativeness is one of the growth determinants. The results of the model for growth estimation are presented in Table 4.

Table 4: Logistic regression model for growth estimation

Variable		regression coefficient	p-value LR test
Entrepreneur			
Without previous experience in entrepreneurship		0.927	0.03
Enterprise			
Without problems in financing in the last 3 years		0.676	0.1
The age of used technology	1 to 5 years old	-0.784	0.137
	Older than 5 years	-1.482	0.093
Environment			
F: Market barriers		0.531	0.012
F: Capital availability barriers		-0.483	0.031
Goodness of fit of the model: AIC=170.99 Nagelkerke R^2=0.199			
Accuracy of the model: Hit rates for non-growing = 75%; Hit rates for growing =66.7%; Total hit rate =72.2% AUC=0.857; KS=62.5			

Results of the logistic regression model for growth estimation reveal five important determinants of growth, which do not include innovativeness, contrary to what we hypothesized. It can be noticed that both lack of previous experience in entrepreneurship and lack of financial problems in the last 3 years have a positive impact on growth. The log odds ratio that an SME owned by an entrepreneur with no previous experience in entrepreneurship, as opposed to one owned by an entrepreneur with experience, will achieve growth is higher by 0.927. Also, the log odds ratio that an SME that didn't experience financial problems in the last 3 years, as opposed to an SME with financial problems, will become a growing SME is higher by 0.676. Regarding the novelty of the technology used, the newer the technology being used, the higher the probability of growth. Barriers to access to new markets are positively related to growth, while barriers to

capital availability have a negative correlation to growth. By increasing the ranking of barriers to access new markets by 1, the log odds ratio of an SME achieving growth will increase by 0.531. On the contrary, by increasing the ranking of barriers to capital availability by 1, the log odds ratio of an SME becoming a growing SME will decrease by 0.483.

Due to the fact that innovativeness is not a significant variable in the model for growth estimation, our third hypothesis has not been proven.

In order to additionally investigate the relationship between growth and innovativeness, we tested differences between high-growth SMEs that have come out as innovative and high-growth SMEs that have not come out as innovative. Results are given in Table 5.

Table 5: Descriptive statistics and Mann-Whitney test for differences in distributions for innovative vs. non-innovative SMEs in high growth SMEs

Variable	Growing non-innovative mean (sd)	Growing innovative mean (sd)	p-value
Entrepreneur			
Age	43.52 (9.30)	40.35 (8.79)	0.1084
Number of failed enterprises owned by the entrepreneur	0.04 (0.172)	0.029 (0.2)	0.8448
Skills (F)	0.285 (1.022)	-0.166 (0.767)	0.0538 *
Experience (F)	-0.175 (0.845)	0.182 (1.072)	0.2427
Risk taking propensity (F)	0.336 (0.806)	-0.128 (0.78)	0.0229 **
Enterprise			
Age	14.44 (6.445)	9.088 (10.882)	0.0809 *
Number of employees	9.6 (12.58)	7.853 (19.744)	0.9384
Estimated number of employees in the next 5 years	0.96 (0.71)	2.265 (0.735)	0 ***
Focus on growth (F)	-0.005 (0.696)	0.251 (0.903)	0.2427
Competition (F)	-0.039 (0.976)	-0.118 (1.091)	0.5993
Fulfilling market needs (F)	-0.069 (0.978)	0.184 (1.009)	0.3327
Percentage of employees with highly specialized knowledge	34.12 (35.764)	58.06 (37.648)	0.0134 **
Variable	Growing non-innovative mean (sd)	Growing innovative mean (sd)	p-value
Training hours of employees in the last two years	133.5 (1709.418)	465 (229.407)	0.1276
R&D: Intangible assets/ total assets	0.001 (0.03)	0.011 (0.003)	0.1295
INVESTMENT: Investment in long-term assets/ total assets	0.018 (0.079)	0.037 (0.055)	0.271
LIQUIDITY: Current assets/current liabilities	1.595 (7.308)	3.147 (1.634)	0.1269
EXPORT: Percentage of customers outside Croatia	11.4 (37.826)	30.99 (22.524)	0.0016 ***

Table 5: Descriptive statistics and Mann-Whitney test for differences in distributions for innovative vs. non-innovative SMEs in high growth SMEs			
EXPORT: Exports/total sales	0.039 (0.309)	0.178 (0.16)	0.0401 **
PRODUCTIVITY: Revenues/number of employees	272500 (309478.245)	373800 (210600.721)	0.3415
TURNOVER: Revenues/total assets	2.306 (2.147)	2.439 (1.674)	0.945
CAPITAL STRUCTURE: Liabilities/assets	0.842 (0.485)	0.707 (0.523)	0.3338
CAPITAL STRUCTURE: Bank loans/assets	0.111 (0.091)	0.049 (0.15)	0.1519
PROFIT: Net profit margin (%)	3.828 (12.936)	10.02 (3.889)	0.1387
PROFIT: Return on equity (%)	47.73 (951.113)	-128.1 (101.004)	0.4475
Environment			
Macroeconomic barriers (F)	0.065 (0.933)	-0.156 (0.974)	0.4692
Market barriers (F)	0.142 (0.866)	0.026 (0.995)	0.6533
Capital availability barriers (F)	-0.05 (0.85)	-0.405 (0.995)	0.1397
Market dynamics (F)	0.016 (0.858)	0.252 (0.936)	0.4978
* statistically significant at 10% ** statistically significant at 5% *** statistically significant at 1%			

Owners of growing innovative SMEs, compared to growing non-innovative SMEs, are less willing to take risks and they feel that do not have enough skills related to strategic thinking, organization and decision-making. Growing innovative SMEs are younger, employ more specialists and have a higher aspiration for employment in the next 5 years. Also, they are better in internationalization compared to growing SMEs that are not innovative. There are 17.6% growing innovative SMEs that have products new to all their customers, while the same percentage for growing non-innovative SMEs is 4% ($p=0.009$). Additionally, 8.8% growing innovative SMEs have unique products, while the same percentage for growing non-innovative SMEs is 0% ($p<0.016$). Regarding the usage of the newest technology, 14.7% innovative SMEs and 0% non-innovative SMEs use technology not older than 1 year ($p=0.033$). Considering the differences between growing innovative and growing non-innovative SMEs, we can conclude that our fourth hypothesis has been proven.

5. Conclusion and discussion

Small and medium enterprise growth has recently become one of the central issues of entrepreneurship research. Understanding SMEs' growth is especially important since it is the small and medium-sized, growth-oriented enterprises that make the most tangible contribution to economic growth. In this paper, we have compared growing and non-growing SMEs, using a sample of 181 SMEs from Croatia. An SME is defined as growing if it has an average annualized growth in sales greater than 10% a year, two years in a row.

According to previous research we expected that, compared to non-growing SMEs, growing SMEs would be innovative (Mason, Bishop and Robinson, 2009; Subrahmanya, Mathirajan and

Krishnaswamy, 2010; European Commission, 2010; Coad, Segarra and Teruel, 2015; Love and Roper 2015), growth-oriented (Kolvereid *et al.*, 1996; Delmar, 1996), focused on competition and on fulfilling market needs (Baldwin and Gellatly, 2006). None of the mentioned characteristics were found to be relevant for growing SMEs in Croatia. Instead, growing SMEs invest less in long-term assets, they are less indebted and use newer technology. Their level of innovation is the same as that of non-growing SMEs. Also, they have the same level of growth orientation and they operate in markets with similar competition. As far as market needs are concerned, both are focused on satisfying current customers, as well as on attracting new ones. After making a comparison between growing and non-growing SMEs, we additionally developed a logistic regression model in order to identify factors that influence growth. It has been shown that both lack of previous experience in entrepreneurship and lack of financial problems are positively related to growth. The newer the technology being used in the enterprise and the lower the barriers to capital availability, the higher the probability of growth. Some other studies also find relationship between technology, R&D and growth (Baldwin and Gellatly, 2006; Coad *et al.*, 2015; Demirel *et al.*,2013). SMEs that can deal with high barriers to access to new markets have a higher probability to achieve growth. It seems that growing SMEs are actually high-tech SMEs that use the newest technology and can successfully sell their products and services in the country. They have neither had financial problems nor problems in finding capital or investors. But, they are also not more innovative than non-growing SMEs. Some previous studies also find that innovation has no significant impact on growth (Almus and Nerlinger, 1999; Bottazzi *et al.*, 2001; Grundström *et al.*, 2012). Since the growth model revealed that there is no relation between innovativeness and growth, the question is which factors are related to innovativeness.
Our research found that the following factors are linked to innovativeness: entrepreneurs' experience, growth aspiration, investment in human capital, internationalization, profit margin and novelty of products and technology. So, innovative SMEs in Croatia will not achieve higher growth compared to non-innovative SMEs, but they will have the aspiration to hire more in the future and they will invest in human capital. Also, they do have higher exports and profit margin, their products are unique and new, as well as the technology they use. Eventually, there is potential that all of this will ultimately lead to higher growth. The results of comparison between growing innovative and growing non-innovative SMEs, which show that the former have higher exports, newer products and apply the newest technology, support this claim thesis.

There is still a smaller number of studies investigating the relationship between innovation and growth, compared to extensive literature about enterprise growth. Moreover, there are studies that show a positive relationship between growth and innovation, but also some that find innovation has no significant impact on growth or even that there is a negative relationship between growth and innovation. These are all reasons why it is important to make additional efforts in analyzing innovation and growth. As a guideline for further research in Croatia, certain improvement needs to be made in defining the variable that would describe innovativeness. Further, a comprehensive dataset consisting of innovation data and all other characteristics of enterprises, entrepreneurs and environment would be of great interest. In this way, relevant factors that influence innovation and growth could be revealed. If they are identified, certain actions can be taken in order to stimulate innovation and growth.

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