MULTI-GROUP ANALYSIS OF FACTORS AFFECTING THE VIABILTY OF BUSINESS IDEA

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Abstract

This paper aims to analyze the relationship between creativity, the use of different techniques for business opportunities search and viability of business ideas. The respondents were students of the Engineering Management Department, Technical Faculty in Bor, before and after listening to the course of Entrepreneurship. Conceptual model was developed and tested. In order to get the most realistic picture of whether there is a difference in thinking of students before and after the course, multigroup SEM analysis was performed. Results have shown that same model is valid for both group of students.

Key words: creativity, creative strategies, data collection, multigroup analysis

JEL Classification: M11, M21, L26

Introduction

Scientific literature describes the entrepreneur as a creative and innovative individual who is searching for new solutions to create new value (Kirzner, 2009).

Some alternative approaches say that entrepreneurship does not just include creative and innovative thinking, but also includes knowledge (Heinonen, 2011).

This study examines the impact of both of these aspects. Starting from the stereotypical characteristics of entrepreneurs, creativity, examine the extent to which individuals are using creative strategies for opportunity search, and to what extent the knowledge, and how both of these strategies affect the viability of a business idea.

The model was developed and modified based on the model that was developed by Puhakka, 2007. The aim of the course on Entrepreneurship is that young people develop or improve skills to generate new ideas.

Hypothesis development

Although it is believed that most people are somewhat creative, there are highly creative people with certain characteristics such as innovativeness, openness, independence, initiative-taking. They do not make conclusions about the idea too early, but think about it for a while.

According to contemporary understanding, creative thinking can still be improved by systematic usage of certain techniques which can contribute to the development of the creativity of entrepreneurs through the generation of a large number of ideas. Although creativity is difficult to learn, there are a number of integral and analytical methods and techniques that stimulate creative thinking. Shane (2003) emphasizes the creative role of entrepreneurs in the organization and in his paper notes that many teams use various forms of brainstorming in order to increase the number of new ideas, and thus encourage creativity of entrepreneurs. Therefore, it can be defined the following hypothesis:

H1: Creativity is positively associated with creative opportunity search strategies

Information from the market are defined as data related to the current and potential stakeholders and they can be found in various external sources (Moorman, 1995). The effect which collection and use of information has on the viability of the business idea is emphasized several times in the literature on entrepreneurship (Kawakami et al., 2012). During their training, students of management, learn how to collect, analyze and use information from the market, and it is believed that this analytical approach encourages creativity (Gibb, 2002). Students are encouraged to show their creative and innovative side. Therefore, the following hypothesis was proposed:

H2: Creativity is positively associated with opportunity search strategies based on knowledge acquisition

Although people usually admire entrepreneurs because of their creativity in finding new ideas, the process of generating new ideas must be supported by organized data collection about the market, customers and competitors. So both of these business opportunities search strategies must be implemented. Therefore, two hypotheses were proposed:

H3: Creative opportunity search strategies are positively associated with the perceived viability of the business idea.

H4: Opportunity search strategies based on knowledge acquisition are positively associated with the perceived viability of the business idea.

According to hypotheses H1–H4, the conceptual model has been defined for the influence of certain parameters on the viability of business idea.





The survey was conducted in October 2014 and January 2015, at the beginning and at the end of the course on Entrepreneurship, at the Department of Engineering Management (Technical Faculty in Bor). The first part of the survey was conducted in October 2014, before the Entrepreneurship course even started and 84 students completed the questionnaire. The second part of the research was done after listening to the course and 112 students participated.

The questionnaire consists of two parts. The first part consists of 5 questions which lead to the demographic data the second part consists of 16 research questions. The research questions were divided into four groups: Creativity, Viability of the Idea, Creative strategies and Business Opportunity Search Strategies. For the assessment of the answers, we used a five-point Likert scale, where 1 means 'strongly disagree'; 3, 'neutral' and 5, 'strongly agree'.

During the three-month course, students had the opportunity to attend course how to prepare a business plan. First they formed teams that consist of 5 to 6 members, and after the course, each team presented their ideas.

Descriptive statistics of socio-demographic questions is shown in Table 1.

| Factor | Category | Percent |
|-------------------------------|------------|---------|
| Gender | Male | 42,8 |
| | Female | 57,2 |
| Average grade during studying | 6,00-7,00 | 55,2 |
| | 7,01-8,00 | 37,6 |
| | 8,01-9,00 | 3,6 |
| | 9,01-10,00 | 3,6 |
| Do you have your own firm? | No | 88,7 |
| | Yes | 11,3 |

Table 1. Results of descriptive statistics

Results and debate

Factor analysis

The structural equation modelling (SEM) was adopted for the causal relationship data analyses between the constructs.

| | | Exploratory Factor A (EFA) | Analysis | Confirmatory Factor Analysis (CFA) | | | | |
|------------------|----------|---|-------------------|------------------------------------|------------------------------|-----------|--|--|
| Group | Variable | PCA | | Reliability | liability Convergent validit | | | |
| Group | | % variance that can be describe one- dimensional factor | Factor loading | Cronbach's alfa | Factor loading | t-value | | |
| | I_1 | 51.849 | 0.776 | 0.766 | 0.760 | 8.330*** | | |
| | I_2 | | 0.674 | | 0.766 | 6.909*** | | |
| Creativity (I) | I_3 | | 0.685 | | 0.607 | 7.034*** | | |
| | I_4 | | 0.718 | | 0.759 | 7.000*** | | |
| | I_5 | | 0.743 | | 0.605 | 1.000 | | |
| Viability of | II_1 | 61.404 | 0.786 | | 0.700 | 1.000 | | |
| Business Idea | II_2 | | 0.707 | 0.789 | 0.823 | 7.370*** | | |
| (II) | II_3 | | 0.807 | | 0.806 | 8.884*** | | |
| (11) | II_4 | | 0.828 | | 0.727 | 9.052*** | | |
| Creative | III_1 | 64.277 | 0.787 | 0.811 | 0.623 | 1.000 | | |
| creative | III_2 | | 0.800 | | 0.748 | 8.898*** | | |
| (III) | III_3 | | 0.823 | | 0.811 | 9.155*** | | |
| (111) | III_4 | | 0.797 | | 0.703 | 8.940*** | | |
| Strategies based | IV_1 | 77.330 | 0.876 | 0.852 | 0.721 | 11.427*** | | |
| on knowledge | IV_2 | | 0.910 | | 0.701 | 12.389*** | | |
| acquisition | IV_3 | | 0.852 | | 0.750 | 1.000 | | |
| (IV) | | | | | | | | |

Table 2. The results of the EFA and CFA statistics for control measuring model

Before evaluating the fit of the conceptual model presented in Figure 1, it is necessary to define a measurement (control) model to verify that the 16 measurement variables written to reflect the four unobserved constructs-groups, do so in a reliable manner. Important issues of defined model functionality are its validity and reliability. Therefore, Confirmatory Factor Analysis (CFA) was applied on all latent groups of the measurement model at the same time, forcing correlation relationship between four defined groups. The obtained values are shown in Table 2.

Although, PCA analysis had already uncovered unidimensionality within four groups, CFA with maximum likelihood estimation, confirmed that the overall measurement model fit appeared quite good. The reliability and fit measures of measurement model are also shown in Table 2.

The CFA parameters of unidimensionality and reliability (Cronbach'salfa) of the scales, indicate that all the groups are unidimensional and highly reliable.

Furthermore, CFA was used to assess convergent validity (Zivković et al., 2010) and if all factor loadings of indicators on their constructs were significant, convergent validity was attained. The values of factor loading, t-value and p-value (p<0.05), shown in the Table 2, imply that all constructs have strong convergent validity.

Based on CFA analysis the goodness-of-fit measures were calculated both for control and conceptual model. The obtain values of fit indicators are shown in Table 3.

| Model | Chi- square (<u>x</u> 2) | Degree of Freedom (df) | Relative Chi- square (χ2/df) | Goodness- Of-Fit Index (GFI) | Root Mean Square Error Of Aproximation (RMSEA) | Comparative Fit Index (CFI) | Standard. Root Mean Square Error Of residual (SRMR) |
|---|---------------------------------|------------------------------|---------------------------------------|------------------------------------|--|-----------------------------------|--|
| Values for the control (measuring) model | 153.41 | 95 | 1.61 | 0.921 | 0.043 | 0.886 | 0.051 |
| Values for conceptual model | 163.56 | 100 | 1.63 | 0.913 | 0.057 | 0.950 | 0.037 |
| Prescribed values | - | - | ≤3 | ≥0.80 | ≤0.08 | ≥0.9 | ≤0.08 |

Table 3. The values of the indicator fitting for measuring and conceptual model

Path model

The results of SEM analysis are shown in Figure 2. Regression coefficients are presented within the arrows and they explain the strength of the relationship between dependent and independent variables. It can be seen that all coefficients have positive value and they are highly significant.

Regression coefficients between predictor variables and the dependent variables are shown in Figure 2, and it can be seen also that there is a linear relationship between variables. Regression analysis can determine not only the influence which dependent have on independent variables, but also to predict the future change of the dependent variables in relation to the change of independent.



The results of path analysis showed that all four hypotheses were confirmed with certain statistical significance. The R2 (Squared Multiple Correlations) value represents the percentage of variance in an endogenous construct explained by other constructs connected to it directly. Interpreted as multiple regression results, the R2 value indicates the amount of variance explained by the model. The overall model explained 74.8% and 46.7% of the variance in Creative strategies and Strategies based on knowledge acquisition, respectively. In addition, the model explained 59.8% of Viability of Business Idea.

Multigroup analysis

The aim of the multi-group analysis is a comparison of model fitting between groups (Savic et al., 2012). In this analysis, attention is focused on the similarities and differences in the responses of students before and after listening to the course on Entrepreneurship. Thus each hypothesis is tested individually regarding the factor Group.

Multi group analysis begins by creating a control model for a combined data set for the Group before the course and Group after the course (N = 196). The hypothesis which is being tested is that the control model is valid for both groups of students. This hypothesis requires that the regression weights, which predict the group variables are the same for both groups (group invariant). And requires that each regression weight for the sample before the course to be equal to the corresponding regression for the sample size after the course.

In order to test the differences between these two groups of students in the regression sizes (factor loadings) for this control model is necessary to (1) create separate but identical control sample models for students before and after listening to the course, (2) to connect these models with their respective groups of data, (3) to set invariant (in which hypotheses for before and after listening to the course have the same regression weight) and variable (variant) model (in which hypotheses for before and after listening to the course have different regression weight) that can be directly compared, and (4) use Critical ratio test for testing difference in regression weights. Although, it is probably reasonable to assume that the unobserved and the observed variables have different variance and covariance between students' opinions before and after the course, two groups can have the same regression weights. For a invariant group it is presumed that the regression weights for each hypothesis are equal to the group before and after the course, while in the group variant model calculates the coefficients independent of the group and serves us to see where there are differences.

The results for this control model for the group invariant and variants are shown in Table 4.

| Model | Chi- square (χ2) | Degree of Freedom (df) | Relative Chi- square (χ2/df) | Goodness- Of-Fit Index (GFI) | Root Mean Square Error Of Aproximation (RMSEA) | Comparative Fit Index (CFI) | Standard. Root Mean Square Error Of residual (SRMR) |
|----------------------|------------------------|------------------------------|---------------------------------------|---------------------------------------|--|-----------------------------------|--|
| Group Invariant | 340.43 | 216 | 1.58 | 0.829 | 0.055 | 0.906 | 0.059 |
| Group Variant | 338.71 | 212 | 1.6 | 0.830 | 0.056 | 0.904 | 0.058 |
| Prescribed values | - | - | ≤3 | ≥0.80 | ≤0.08 | ≥0.9 | ≤0.08 |

Table 4. Indicators for Group Invariant and Group Variant

The results presented in Table 4 show that all calculated indicators are within the prescribed values. After this, couples in Critical Ratio testwere observed, those that are larger or smaller than \pm 1.92 must be separated. These pairs vary and for them we can not set the same model because they do not have the same impact. Table 5 shows the results of Critical Ratio test. Based on these results, we can conclude that all couples can replace each other, because all values are below or above prescribed.

Table 5, Critical Ratio Test (Group Variant)

| | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P9 | P10 | P11 | P12 |
|----|--------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| N1 | 0,225 | 1,241 | 2,129 | 1,387 | -1,459 | -0,626 | -1,521 | -0,514 | -1,009 | -0,837 | -1,394 | -1,297 |
| N2 | -0,954 | 0,093 | 0,963 | 0,265 | -2,444 | -1,669 | -2,395 | -1,874 | -2,438 | -1,712 | -2,301 | -2,206 |
| N3 | -0,263 | 0,807 | 1,733 | 0,968 | -1,912 | -1,081 | -1,916 | -1,112 | -1,663 | -1,22 | -1,802 | -1,705 |
| N4 | -0,547 | 0,498 | 1,384 | 0,661 | -2,118 | -1,316 | -2,103 | -1,409 | -1,954 | -1,417 | -1,997 | -1,901 |
| N5 | 1,516 | 2,463 | 3,319 | 2,582 | -0,315 | 0,573 | -0,472 | 0,959 | 0,544 | -0,199 | -0,311 | -0,215 |
| N6 | 1,33 | 2,331 | 3,243 | 2,457 | -0,546 | 0,36 | -0,685 | 0,725 | 0,277 | 0,003 | -0,527 | -0,429 |
| N7 | 1,5 | 2,478 | 3,371 | 2,6 | -0,375 | 0,53 | 0,529 | 0,924 | 0,493 | 0,154 | -0,367 | -0,27 |
| N8 | 0,682 | 1,748 | 2,711 | 1,89 | -1,155 | -0,26 | -1,236 | -0,04 | -0,549 | -0,533 | -1,095 | -0,996 |
| N9 | 0,664 | 1,787 | 2,817 | 1,934 | -1,23 | -0,314 | -1,302 | -0,102 | -0,648 | -0,583 | -1,162 | -1,06 |

| | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P9 | P10 | P11 | P12 |
|-----|--------|-------|-------|-------|--------|--------|--------|--------|--------|--------|-------|--------|
| N10 | -1,028 | 0,029 | 0,905 | 0,204 | -2,508 | -1,736 | -2,451 | -1,968 | -2,543 | -1,766 | -2,36 | -2,265 |
| N11 | 0,483 | 1,534 | 2,471 | 1,678 | -1,298 | -0,423 | -1,365 | -0,253 | -0,76 | 0,668 | -1,23 | -1,131 |
| N12 | 1,025 | 2,042 | 2,961 | 2,174 | -0,818 | 0,077 | -0,932 | -0,377 | -0,09 | -0,241 | 0,783 | -0,684 |

Continue Table 5, Critical Ratio Test (Group Variant)

For a defined conceptual model, which is shown in Figure 1, Multigroup path analysis is used. After recalculation the results of model fitting and Critical Ratio test for the formed Multigroup path analysis model, were obtained. The results are shown in Table 6.

Since it was found that all couples can replace each other and that for both groups Before and After listening to the course, the values of Crtitical Ratio Test for the proposed hypotheses were examined.

| | NW1 | NW2 | NW3 | NW4 |
|-----|--------|--------|--------|--------|
| PW1 | 0.383 | 0.234 | -2.847 | -0.093 |
| PW2 | -0.311 | -0.383 | -3.009 | -0.538 |
| PW3 | 1.964 | 1.923 | -0.858 | 1.597 |
| PW4 | 1.752 | 1.584 | -1.697 | 1.262 |

Table 7, Critical Ratio Test for differences between parameters

Based on the results, we can conclude that all hypotheses can be substituted for one another in both models. Regression coefficientin group variant for a group of students before listening to the course (PW) and after listening (NW), which were obtained after the calculation for the multi-group analysis, are presented in the picture:

The Squared Multiple Correlations (R2), which can describe dependent group variables, differ for VARIANT group, within which these coefficients are different for the two groups. The table shows the coefficients of determination.

Figure 3. Multigroup model



| | VARIANT | | | | | | |
|---|-------------------|------------------|--|--|--|--|--|
| | Before the course | After the course | | | | | |
| Creative strategies | 79,1% | 73% | | | | | |
| Strategies based on knowledge acquisition | 44,4% | 51% | | | | | |
| Viability of the Business Idea | 62,8% | 60,6% | | | | | |

Results of multi-group path analysis showed that for a group of students Before listening course all hypotheses are confirmed with the appropriate statistical significance, while in the group of students After listening course hypothesis H3 has no statistical significance.

Conclusion

This study contributes to the understanding the importance of how individual creativity affect the viability of the idea, as well as to point out the ways how students are looking for new business ideas. Creativity has positive influence on creative strategies and strategies based on knowledge acquisition. Also, has impact on viability of business idea, Its role is indirect but positive.

Although usually entrepreneurs are often admired because for their creativity in finding new ideas, our study has shown that this is not the whole truth. The process of generating new ideas must be supported by organized data collection about the market, customers, and competitors. So both of these strategies for searching business opportunities must be implemented. In the current study results showed that the data collection has a stronger impact on the viability of the idea, which is not in accordance with previous similar research.

Practical implication: Those students who are born entrepreneurs must be encouraged to use different strategies when searching for new business opportunities. This process will result in generating as many new and innovative ideas based on market research and the use of market information.

The aim of the course was to train the students how to think creative, how to use information from the market when they generate new business idea and then on that basis try to devise new and creative solutions. Also, the course aims to promote the spirit of entrepreneurship among youth, to draw attention to its key features and benefits and to open new vistas in terms of their career.

As with any research, this research has some limitations. The first limitation is that the students self-reported their creativity and the viability of their ideas, and whole research rely on their subjective judgment. Another limitation is that the collected data refer only to a group of students of Technical faculty in Bor, and thus can not apply to the entire student population.

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