Innovation confidence: Slovenia country case

Blaž Grudnik Tominc, Andrej Božin
University of Maribor, Slomškov trg 15, 2000 Maribor, Slovenia
Vocational College of Traffic and Transport, Preradovičeva 33, 2000 Maribor, Slovenia

Abstract
In this original scientific paper we analyse an innovation confidence and its relationship with the early-stage entrepreneurial activity in Slovenia, an EU country that has been quite significantly affected by the global economic crisis. The developed entrepreneurial sector has a critical effect on economic growth and the success of national economies, therefore we investigate the receptivity of individuals to innovations, since positive attitudes of individuals towards innovative products and services are very likely positively related to individual’s entrepreneurial intentions. The main result of this paper is that personal beliefs into benefits of innovative products and services are positively related to one’s involvement into the early-stage entrepreneurial activity.

Indexing terms/Keywords
Entrepreneurial activity, attitudes towards Innovations.

Academic Discipline and Sub-Disciplines
Entrepreneurship and Innovations.

SUBJECT CLASSIFICATION
JEL classification: L26 – Entrepreneurship; O31 - Innovations

TYPE (METHOD/APPROACH)
This is a quantitative empirical research. The data basis for this paper is based on Global Entrepreneurship Monitor (GEM) research. Global Entrepreneurship Monitor is the most comprehensive research in the field of entrepreneurship in the world. Our data base consists of the adult population survey in Slovenia in 2011, with N=2,009 respondents. GEM combines over 70 countries all over the world. The main purpose of GEM research is to develop the data base that enables numerous and rich comparisons of many different characteristics of entrepreneurship among countries. To test hypotheses formed the factor analysis and binominal logistic regression methods were used.

INTRODUCTION
This paper focuses on the analysis of relationship between the individuals’ attitudes towards acceptance of innovations and their decision to start the entrepreneurial career. The theoretical basis for our research is twofold: (i) based on Bhide’s assumption, that economic success of innovative entrepreneurship depends on how consumers of innovative products and services are open to accept innovativeness, we analyse the demand-side indicators of innovativeness which are presented in this paper; and (ii) – since a theoretical dispute no longer exists to suggest that the developed entrepreneurial sector has a critical effect on economic growth and on the success of national economies [2], [3], [4], [5], [6] etc., we analyse the relationship between attitudes of adults towards innovations and their entrepreneurial intentions.

Our paper is focused on the case of Slovenia. Slovenia is an EU country that has been quite significantly affected by the global economic crisis. Slovenia is a small open economy promoting entrepreneurship (also social entrepreneurship) in order to reduce the unemployment rate among young people. The total early-stage entrepreneurial activity in Slovenia in 2014, measured by the percentage of working population, who is involved into the entrepreneurship as nascent or new entrepreneurs (TEA index – Total Early-stage Entrepreneurship Index) was on a very modest level (6.33 %) and is still lagging behind the EU average – average percentage of adults involved into the early stage entrepreneurial activity equals 7.71 % in EU in 2014 [2]. Slovenia follows the EU strategy regarding entrepreneurship – the European Commission prepared the future 2020 strategy to support entrepreneurship by supporting young innovative companies [7]. Since entrepreneurs have particular difficulties raising funds to finance the early stages of their businesses, the support for these areas is proposed by the Commission under the future Programme for the Competitiveness of Enterprises and SMEs (COSME) and the Horizon 2020, and are reinforced under the European Structural Funds [8, pp. 8-9].

In the past Slovenia was a part of the Austrian-Hungarian Monarchy, it has the experience of almost half a century of socialism and of a communist history, since it spent also seven decades as part of the former Yugoslavia. The prevailing ethnicity is Slovenians and country is highly ethnically homogenous (at 90% of prevailing ethnicity), and with one dominant language: 92% (Slovene). The population is predominantly Roman Catholic.
Some characteristics of the analyzed country are presented in Table 1, which shows, among other things, the total early stage entrepreneurial activity index, as described in the previous page. TEA index describes the prevalence rate of individuals in the working age population who are actively (as owners and managers of firms) involved in business start-ups, either in the phase in advance of the birth of the firm (nascent entrepreneurs) or in the phase of spanning over 42 months after the birth of the firm (new entrepreneurs) [9], with the birth of a firm considered as a time when firm is paying wages for more than three months.

According to the Growth Competitiveness Report, Slovenia cannot be considered as either technologically developed or globally competitive. Economies, according to the phase of economic development may be classified as factor-driven, efficiency driven and innovation-driven [10]. These categories are included in the Global Competitiveness Report (GCR), which identifies these three phases of economic development based on GDP per capita and the share of exports comprising primary goods. Global Competitiveness Report [11] classifies Slovenia as innovation-driven economy.

### Table 1: GCI-overall, GDP per capita (PPP) and Total early-stage entrepreneurship prevalence rate

<table>
<thead>
<tr>
<th>Country</th>
<th>Global Competitiveness Index – overall 2013-2014 (rank)a</th>
<th>GDP per capita (PPP)b</th>
<th>Total early-stage entrepreneurship prevalence ratec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slovenia</td>
<td>4.25 (62)</td>
<td>28,996</td>
<td>6.33</td>
</tr>
</tbody>
</table>

bSource: World Bank, International Comparison Program database: GDP per capita based on purchasing power parity (PPP) (current international $).

The main source of our research is the adult population survey of working population, within the Global Entrepreneurship Monitor (GEM) research. Global Entrepreneurship Monitor is the most important research in the field of entrepreneurship in the world. It started in 1999 with 10 countries included. Many GEM indicators that evolved through years of research are included into OECD reports and statistical yearbooks. In year 2011 the GEM research combines almost 60 countries all over the world. Slovenia is participating in GEM since 2002.

### LITERATURE REVIEW AND HYPOTHESES

The past research results assumed that innovative entrepreneurs are unlikely to succeed if they cannot get anyone to buy their innovative products or services [1]. Thus, the important role of entrepreneurship in generating the economy’s growth and success of national economy may be limited. Namely, Bhide [1] suggested that a reason for the relative economic success of the USA as compared to countries in Europe was the acceptability of innovations among American individuals. This hypothesis was further analysed and reliable cross-national measures of consumer demand (acceptance) for innovations were developed [16]. The measurement scale, resulting in two measures of Innovations confidence by consumers, was developed and included also in the Global Entrepreneurship Monitor research model. These two measures are known as the Consumer Innovation Confidence Index (OIC) and Organizational Innovation Confidence Index (OIC) [16].

Consumer Innovation Confidence index captures the three dimensions of innovation confidence of consumers: “willingness to buy new products or services, willingness to try products or services that involve new technology and the belief that new products or services will improve one’s life” [16, pp. 5]. On the other hand, Organizational Innovation Confidence Index refers to the innovativeness of products or services that one might use (similarly as in CIC – buy and try) as part of one’s usual work, with the belief that new products or services will improve one’s working life [16, pp. 15].

Thus the following hypothesis was formed:

**H1: It is possible to establish the Innovation confidence measures for Slovenia.**

The developed entrepreneurial sector has a critical effect on economic growth and the success of national economies [2], [3], [4], [5], [6] etc. Therefore we investigate the receptivity of individuals to innovations (H1), since positive attitudes of individuals towards innovative products and services are very likely positively related to individual’s entrepreneurial intentions. We continue our research with the analysis of the relationship between attitudes of adults towards innovations and their decision to start with the entrepreneurial activity.

As already mentioned, this research is a part of a GEM research. Within this research individuals are identified as nascent, new or established entrepreneurs or as non-entrepreneurs. Nascent entrepreneurs are those who are actively (as owners and managers of firms) involved in business start-ups, in the phase in advance of the birth of the firm. New entrepreneurs are those who are actively involved in a business start-up in the phase of spanning over 42 months after the birth of the firm [9]. Nascent and new entrepreneurs are included into our analysis as individuals, who decided to start with the entrepreneurial career.
Thus the following hypothesis was formed:

\[ H_2: \text{Individual's decision to start with the entrepreneurial activity is positively related to his/her positive attitudes towards innovative products and services.} \]

**METHOD**

**Research design**

A study was conducted using the adult population survey (APS) within the Global Entrepreneurship Monitor (GEM) research, in year 2011 in Slovenia. Within GEM the rich database for complex analysis of several aspects of entrepreneurship studies is available, for several countries – in year 2011 there were 55 countries participating.

The data collected and assembled as part of the GEM research program are consistent with the current technical standards in social science research. The GEM research provides cross-national harmonized datasets on several components and aspects of entrepreneurship (methodology of GEM research and survey are described in more details in [12]).

**Research sample**

The data on attitudes towards innovations and entrepreneurial intentions of individuals in Slovenia were gathered by adult population survey within the GEM 2011 research cycle. In the survey all together \( N = 2,009 \) respondents participated, who were aged between 18 and 64 years (working population).

**Data analysis**

The methodology used includes factor analysis for testing \( H_1 \) and binomial logistic regression for testing \( H_2 \).

Using factor analysis the two factors were extracted out of six dimensions of individuals’ attitudes towards innovations. Attitudes towards innovations were measured with six items on a 1 (strongly disagree) to 5 (strongly agree) Likert scale. First three items referred to innovativeness of products or services that one might try or buy, while the last three items referred to the innovativeness or products or services that one might use as a part of one's usual work, in the next 6 months:

1. In the next 6 months you are likely to try products or services that are new to the market.
2. In the next 6 months you are likely to try products or services that use new technologies for the first time.
3. In the next 6 months, new products and services will improve your life.
4. In the next 6 months the organization that you work in is likely to buy products or services that are new to the organization.
5. In the next 6 months you are likely to try products or services that use new technologies in your daily work for the first time.
6. In the next 6 months, new products and services will improve your working life.

To identify the multidimensional innovation confidence measures (\( H_1 \)), factor analysis was used. Appropriateness and suitability of the data is assessed by the Kaiser-Meyer-Olkin (KMO) and Bartlett’s Test of Sphericity. Higher KMO value signifies higher correlation among the variables: KMO value greater than 0.6 can be considered as adequate. KMO measures the sample adequacy criteria wherein low correlation value of variables indicates that they are not fit to be member of any of the factor. Bartlett’s Test of Sphericity tests the correlation among the variables [14] (test the hypothesis that population correlation matrix is identity matrix). A statistically significant Bartlett’s Test of Sphericity (Sig. < 0.05) indicates that significant correlations exist among the variables. To extract factors the Principle Component Analysis was used. In this technique, correlations of different variables are referred to study the relationship between them and grouping them into a small number of factors having common themes. The calculations will lead to factor scores which explain a maximum possible share of the variance, while factors obtained will be orthogonal and in terms of the number, will be equal to no more than the number of original variables. For simplifying the interpretation of factors the Varimax rotation was used since it minimized the correlation across factors and maximized within the factors. After rotation factors remain uncorrelated (as opposite to oblique rotation, where factors are correlated after rotation). This helped to yield ‘clear’ factors [15].

The reliability analysis using the Cronbach’s alpha was also performed to test the reliability of this measurement scale.

The binomial logistic regression estimates the probability of an event happening [13]. In the case of \( H_2 \), the event (the dependent variable) is that an individual is starting with the entrepreneurial activity as nascent or new entrepreneur (0 – No, 1 – Yes). As already mentioned, in this research nascent entrepreneurs are defined as those individuals, who are involved in business start-ups, in the phase in advance of the birth of the firm while new entrepreneurs are defined as those who are involved in the phase of spanning over 42 months after the birth of the firm [9], with the birth of a firm considered as a time when firm is paying wages for more than three months. The independent variables were the two factors that were describing attitudes of individuals towards innovativeness of products and services and were obtained using factor analysis, when performing testing for \( H_1 \).
In binomial logistic regression the maximum likelihood estimations were used to calculate the logit coefficients which denote changes in the log odds of the dependent variable. We assessed the goodness of fit of the models using the Pearson Chi-square test, the rate of correct classifications and the pseudo R\textsuperscript{2}. The significance of individual independent variables was tested using the Wald statistics. The SPSS 19.0 was used.

**RESULTS**

For testing H\textsubscript{1} we first analysed the 6-items measurement scale of attitudes towards innovative products or services by consumers in Slovenia. Main descriptive statistics results are presented by Table 2.

Table 2: Descriptive statistics – measurement scale for attitudes towards innovation confidence (on a 1 (strongly disagree) to 5 (strongly agree) Likert scale).

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean value</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In the next 6 months you are likely to buy products or services that are new to the market.</td>
<td>3.01</td>
<td>1.31</td>
</tr>
<tr>
<td>2. In the next 6 months you are likely to try products or services that use new technologies for the first time.</td>
<td>2.90</td>
<td>1.31</td>
</tr>
<tr>
<td>3. In the next 6 months, new products and services will improve your life.</td>
<td>2.75</td>
<td>1.29</td>
</tr>
<tr>
<td>4. In the next 6 months the organization that you work in is likely to buy products or services that are new to the organization.</td>
<td>3.05</td>
<td>1.51</td>
</tr>
<tr>
<td>5. In the next 6 months you are likely to try products or services that use new technologies in your daily work for the first time.</td>
<td>2.93</td>
<td>1.48</td>
</tr>
<tr>
<td>6. In the next 6 months, new products and services will improve your working life.</td>
<td>2.68</td>
<td>1.39</td>
</tr>
</tbody>
</table>

As it is presented in Table 2, it seems that people in Slovenia have quite low expectations regarding the usefulness of new products or services, the mean value for items 3 and 6, measuring the beliefs in improvement of one’s life and one’s working life, is below 3, indicating that on average people do not agree that in the next 6 months new products or services will improve their lives. On the other hand the highest average score is recorded regarding the intentions to buy new products or services on the market, for individual purposes as well as on the organizational level – in both cases the average score is slightly below 3.00.

In the next step the factor analysis was performed. The results of the factor analysis indicate that it is meaningful to use factor analysis (KMO = 0.785; Bartlett test of Sphericity = 2,899.612; p < 0.001). Cronbach’s Alpha indicates that the measurement scale is reliable (Cronbach’s Alpha = 0.824). The factor analysis revealed two factors, as presented in Table 3.

Table 3: Total Variance explained

<table>
<thead>
<tr>
<th>Component</th>
<th>Total</th>
<th>% of variance explained</th>
<th>Cumulative variance explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.202</td>
<td>53.364</td>
<td>53.364</td>
</tr>
<tr>
<td>2</td>
<td>1.194</td>
<td>19.01</td>
<td>72.366</td>
</tr>
<tr>
<td>3</td>
<td>0.561</td>
<td>9.348</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.410</td>
<td>6.830</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0.354</td>
<td>5.905</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0.279</td>
<td>4.652</td>
<td></td>
</tr>
</tbody>
</table>

As presented in Table 3, the first two factors explain 73.266\% of total variance of all 5 original variables (items), that is the satisfactory result. Therefore the first two factors were included into the varimax rotation and the final factor loadings were obtained, as presented in Table 4, that yield to the quite clear meaning of factors. Since the first factors contains high factors loading at items 4-6, that refer to the organizational level on innovation confidence, the first factor was named as “Organizational level of innovation confidence”. The second factor has high factor loadings at items 1-3, thus it was called “Individual level of innovation confidence”.


Table 4: Component matrix – factor loadings

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In the next 6 months you are likely to buy products or services that are new to the market.</td>
<td>0.117</td>
<td>0.835</td>
</tr>
<tr>
<td>2. In the next 6 months you are likely to try products or services that use new technologies for the first time.</td>
<td>0.198</td>
<td>0.837</td>
</tr>
<tr>
<td>3. In the next 6 months; new products and services will improve your life.</td>
<td>0.279</td>
<td>0.746</td>
</tr>
<tr>
<td>4. In the next 6 months; the organization that you work in is likely to buy products or services that are new to the organization.</td>
<td>0.866</td>
<td>0.107</td>
</tr>
<tr>
<td>5. In the next 6 months you are likely to try products or services that use new technologies in your daily work for the first time.</td>
<td>0.850</td>
<td>0.258</td>
</tr>
<tr>
<td>6. In the next 6 months; new products and services will improve your working life.</td>
<td>0.832</td>
<td>0.261</td>
</tr>
</tbody>
</table>

Therefore it was possible to establish the Innovation confidence measures for Slovenia and thus H1, that it is possible to establish the Innovation confidence measures for Slovenia, is confirmed.

For testing H2, that individual’s decision to start with the entrepreneurial activity is positively related to his/her positive attitudes towards innovative products and services, the logistic regression analysis was performed, with results, presented in Table 5.

Table 5: Binomial logistic regression results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coeff. (st. er.)</th>
<th>Log odds</th>
<th>Wald</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1: Organizational level of innovation confidence</td>
<td>0.403* (0.150)</td>
<td>1.497</td>
<td>7.245</td>
</tr>
<tr>
<td>Factor 2: Individual level of innovation confidence</td>
<td>0.058 (0.131)</td>
<td>1.060</td>
<td>0.197</td>
</tr>
<tr>
<td>Model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-2.959* (0.139)</td>
<td>0.052</td>
<td>454.639</td>
</tr>
<tr>
<td>N</td>
<td>1,166</td>
<td></td>
<td></td>
</tr>
<tr>
<td>χ²(df)</td>
<td>8.144 (2)*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% correct classifications</td>
<td>94.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²(Nagelkerke)</td>
<td>0.20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results revealed that both organizational as well as individual level of one’s innovation confidence is positively related to one’s decision to start with the entrepreneurial career, but the results regarding the individual level of innovation confidence are not statistically significant (p>0.05). On the other hand we can conclude, that those, who believe, that in the next 6 months their organization will buy and try new products or services and that the new products/services will improve their working life, are on average almost 1.5 times (log odds equal 1.497) as likely to start the entrepreneurial career as compared to those, who do not.

Therefore the hypothesis H2 that individual’s decision to start with the entrepreneurial activity is positively related to his/her positive attitudes towards innovative products and services, can be partly confirmed.

DISCUSSION AND CONCLUSIONS

Although the factors describing one’s attitudes towards innovative products and services in our study are defined differently as compared to Lewie’s study [16], the internal structure of factors that is very clear, confirms, that two aspects of innovation confidence can be established. While “Organizational level of innovation confidence” factor refers to the statements that organization (where one works) is likely to buy and try new products and services, as well as to the belief that this will improve one’s working life, the “Individual level of innovation confidence” factor refers to the statement that an
individual himself/herself is very likely to buy and try new products and services, as well as to the belief that this will improve one's every day's life.

Regarding the internal structure of factors obtained, we can conclude that people in Slovenia have quite low expectations regarding the usefulness of new products or services, but on the other hand the highest average score is recorded regarding the intentions to buy new products or services on the market, for individual purposes as well as on the organizational level.

The main result of our research is that positive attitudes towards innovative products and services at the organizational level are positively related to one's decision to start with the entrepreneurial activity. Those, who believe, that in the next 6 months the organization where they work will buy and try new products or services and that the new products/services will improve their working life, are on average almost one and a half times as likely to start the entrepreneurial career as compared to those, who do not.

These results are very important for policy makers as well for educators and companies. Improving the attitudes towards innovations on general may be an important step towards acceptance of innovations. While culture may play an important part (traditional versus self-initiative cultures) it is also very difficult to change in a short time periods. On the other hand the education may be very effective. On the other hand companies should develop affective marketing communications taking into account the consumer protection rules [16].

Several extensions of our research are possible, especially regarding differences among different groups of individuals in the society: household income, educational level as well as personal values and other characteristics may have a significant effect on innovation confidence and consequently on the entrepreneurial intentions. On the other hand also differences in the characteristics of the entrepreneurial activity (growth aspirations, use of new technologies etc.) could be analysed.

REFERENCES


