Entrepreneurship and Innovation Output
in Central and Eastern European Countries

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Abstract

The necessity to improve the conditions for research and development conducting activities, under Europe 2020 Strategy, requires monitoring of European firms' progress on the topic of innovation. All types of small and medium-sized businesses can innovate, especially those from high-tech sectors, with effects upon improving the European competitiveness level and addressing societal problems. In the case of Central and Eastern European countries, ensuring the innovation-driven competitiveness requires the exploitation of the active population's entrepreneurial, creative and innovative features. In this context, the paper proposes a research model of the small and medium-sized firms' entrepreneurial process in selected Central and Eastern European countries, according to their economic development stage and competitiveness level, leading to the quantitative identification of cause-effect relationships between entrepreneurship and innovation results.

Keywords: *entrepreneur, entrepreneurship, entrepreneurial process, innovation.*

JEL classification: L26, O31.

Introduction

Entrepreneurship, at microeconomic level, can be viewed from two perspectives: the first considers the entrepreneur's attitude and desire to pursue new market opportunities in order to create value, while the second perceives the behaviour of the entrepreneur and of the firm, according to their understanding of opportunity creating imbalances and of resources necessary for their exploitation (McDougall, Oviatt, 2000, p. 903). The attitudinal component of entrepreneurship refers to entrepreneurs as innovative individual or as an intermediary of relations between economic agents owning control over the resources. The behavioural component of entrepreneurship emphasizes the individual effort of the entrepreneur in implementing the firm's vision, its strategic activities and lifelong learning.

At macroeconomic level, entrepreneurship involves the existence of conditions, within the general national framework and of the business environment, provides increased efficiency and innovation, being considered as economic growth factor (Bosma et al., 2010, p. 9).

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In the circumstances of increasing societal problems and of the stagnation of economic performance at European Union level, the Europe 2020 Strategy's objectives aims to enhance competitiveness, sustainability and inclusion in the European economy. The central element of this strategy is represented by the means in which European Union member states are required to integrate tools and actors in research and innovation domains. Starting from the major objective of the New Lisbon Strategy, more efficient utilization of human capital in the economy, by highlighting active population's qualities like being entrepreneurial, creative and innovative, the question arises as of identifying the potential impact that entrepreneurship can have on innovation outcomes in the case of small and medium-sized firms originated from those European countries that are at the same stage of economic development with Romania, namely Hungary, Croatia and Latvia. The importance of the conducted demarche is related to the need of improvement for creating the conditions of research and development activities under the Europe 2020 Strategy, by monitoring the innovation progress within the European firms.

The rest of the paper is organised in three sections as follows: Section 2 lays the theoretical foundation to highlight the conceptual approach on the impact of the entrepreneurial behaviour on innovation outcomes, the conceptual model of entrepreneurial process and research hypotheses, the subsequent section emphasise on variables used in the econometric analysis and the statistical findings, while Section 4 deals with conclusions and research limitations.

1. Research Background

The entrepreneur concept perceived as innovator underlies the paradigm that considers the entrepreneur as the individual who identifies business opportunities from the external environment and uses innovation as a tool for creating successful new business (Schumpeter, 1930 in Van Stel, Carree & Thurik, 2004, p. 10). In a dynamic and continuously changing external environment, the entrepreneurial behaviour and innovation are vibrant, holistic and complementary processes, vital to the success and sustainability of an organisation. In addition, the organisational culture and management style are crucial factors influencing the development of the entrepreneurial and innovative behaviour in organisations (Zhao, 2005, p. 29).

In the context of globalisation and rapid technological changes, the importance of innovation was fundamentally transformed, so that small and medium-sized entrepreneurial firms appeared as the engine of innovative activity (Ács & Audretsch, 2003) and factor of economic growth.

Aiming to assess the global role of entrepreneurship upon the economic growth, Global Entrepreneurship Monitor established a direct link between economic development stage of a country and the level respectively the type of entrepreneurial activities. Starting with the major economic development stages transited by aspiring countries, namely the factor-driven economies, efficiency-driven economies, innovation-driven economies (Porter & Schwab, 2008, p. 7), the conditions of the entrepreneurial framework appears only in the last two stages of

development. Nevertheless the existence of an adequate infrastructure, of a level of primary education and a good health status, as the essential conditions of a factor driven economy, constitutes starting points for the actual stage of economical development and the competitiveness of the Central and Eastern European countries (including Romania, Hungary, Croatia and Latvia). In these countries, the conditions of the entrepreneurial framework are related to efficiency enhancing and innovation factors, reflecting the major qualities of the economy and society. In Romania, a positive and significant link has been found between the general conditions of the national framework, respectively of the entrepreneurial framework and entrepreneurial behaviour (Niţu, Feder, Sîrghi & Haţegan, 2010). Similar results were obtained also for Hungary, Latvia and Croatia, countries in similar economic development stage and competitiveness levels as Romania (Niţu & Feder, 2012a). In addition, for Romania, an entrepreneurial behaviour stimulated by general conditions of the national and entrepreneurial framework highlighted positive effects on innovation output, especially for the small and medium-sized firms and for their economic effects (Niţu & Feder, 2012b).
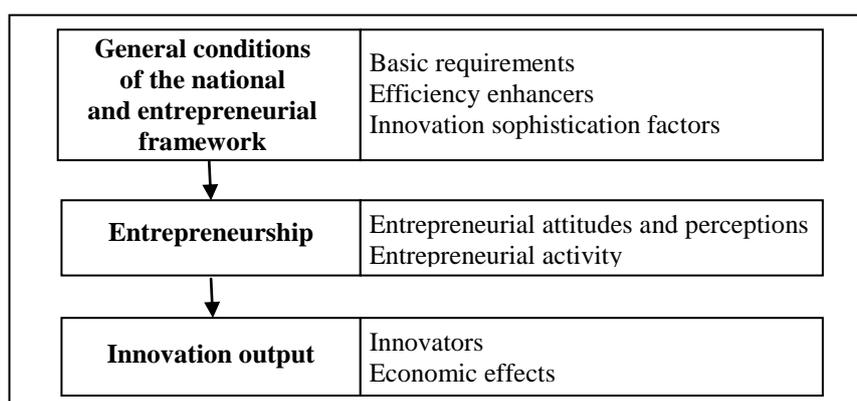
General conditions of the national and entrepreneurial framework	Basic requirements Efficiency enhancers Innovation sophistication factors
Entrepreneurship	Entrepreneurial attitudes and perceptions Entrepreneurial activity
Innovation output	Innovators Economic effects

Figure 1. The entrepreneurial process research model

The proposed conceptual model of the entrepreneurial process (Figure 1.) in selected Central and Eastern European countries has as its' starting point the model proposed by the Global Entrepreneurship Monitor in 2008, to which a few reappraisals were bought (Sala-i-Martin, X. et al., 2009, p. 8; Bosma, N. et al., 2008, p. 10; European Commission, 2011, p. 6). Taking into account the economic development stage and competitiveness level of the selected countries, the proposed entrepreneurial process model aims to highlight the cause - effect relationship between entrepreneurship and innovation outcomes.

The proposed conceptual model of the entrepreneurial process considered only the entrepreneurial behaviour of individuals in the moment of new firm creation and business administration. Consequently, the model referred exclusively to the Schumpeterian entrepreneurs and to the owner-managers of the small and medium-sized firms (Wennekers & Thurik, 1999, p. 442). The first are persons, who allocate resources in order to start a new business owned by them, being motivated either of opportunity exploitation from the business environment or of

the necessity of self-employment (nascent entrepreneurs). In this category can be also included those entrepreneurs who are motivated by the necessity of self-employment, in the sense that even if they aim to exploit opportunities, consciously or not, they might take in consideration self-employment as well. Mostly, after achieving the proposed objectives, nascent entrepreneurs became owner-managers of firms, who posses and administrates new firms, active for a period between 3 and 42 months, or consecrated firms active over 42 months (Reynolds et al., 2005, p. 209). Within the model it was taken into consideration that a part of the nascent entrepreneurs fails to start their business, although they influence the economy through the pressure exercised upon the extant firms.

Table 1. Indicators applied in the statistical analysis

Constructs	Variables	Items/ Indicators
Entrepreneurship	Entrepreneurial attitudes and perceptions	Entrepreneurial intentions Perceived capabilities Perceived opportunities Entrepreneurship as desirable career choice Fear of failure rate Media attention for entrepreneurship
	Entrepreneurial activity	Nascent entrepreneurship rate New business ownership rate Early-stage entrepreneurial activity Established business ownership rate Necessity-driven entrepreneurial activity Opportunity-driven entrepreneurial activity
Innovation output	Innovators	SMEs introducing product or process innovations SMEs introducing marketing/ organisational innovations
	Economic effects	Employment in knowledge-intensive activities Medium and high-tech product exports Knowledge-intensive services exports Sales of new to market/ new to firm innovations Licence and patent revenues from abroad

According to the Romanian, Hungarian, Croatian and Latvian national contexts, the justification of the applied statistical indicators (Table 1.) followed the correct understanding of entrepreneurship, entrepreneurial behaviour and factors influencing the direct impact that this behaviour may have on the innovation output (Niţu & Feder, 2012b).

Based on the entrepreneurial process model (Figure 1) several research hypotheses were set out:

Hypothesis 1: There is a positive relationship between entrepreneurship and innovation output.

Hypothesis 1a: There is a positive relationship between entrepreneurship and innovators.

Hypothesis 1b: There is a positive relationship between entrepreneurship and economic effects of innovations.

Hypothesis 2: There is a positive relationship between the entrepreneurial

perceptions, attitudes and innovation output.

Hypothesis 2a: There is a positive relationship between the entrepreneurial perceptions, attitudes and innovators.

Hypothesis 2b: There is a positive relationship between the entrepreneurial perceptions, attitudes and economic effects of innovations.

Hypothesis 3: There is a positive relationship between entrepreneurial activity and innovation output.

Hypothesis 3a: There is a positive relationship between entrepreneurial activity and innovators.

Hypothesis 3b: There is a positive relationship between entrepreneurial activity and economic effects of innovations.

2. Methodology, Data Analysis and Findings

Data for the statistical analysis is of external secondary type, collected for the interval between 2007-2011, due to the methodological modification for data inclusion and treatment regarding the national competitiveness from 2007 onwards, alike the lack of entrepreneurship data before year 2007 for each of the selected CEE countries.

Descriptions regarding the entrepreneurial behaviour, alike entrepreneurial perceptions, attitudes and activity, are derived from the annual national country reports and global reports of the Global Entrepreneurship Monitor Consortium, while statistics for innovation outcome were obtained from the database of European Commission's Enterprise and Industry Directorate General, Pro Inno Europe, Innovation Scoreboards' standardised scores.

The data exploration was carried out using a simultaneous equations model. For operationalisation, the proposed research model includes independent and dependent variables, searching for potential correlations and relationships between entrepreneurial behaviour (independent variable) and innovation outcome (dependent variable).

Data processing and analysis was performed with IBM SPSS 20. The measuring scales are explicitly defined in the Global Entrepreneurship Monitor Consortium methodologies and in the technical annex of the European Commissions' Innovation Scoreboard; being generally accepted assures their internal validity and reliability.

Table 2. Correlation matrix of the key variables

Countries	Entrepreneurial perception & attitudes				Entrepreneurial activity				Entrepreneurship				Innovation output
	Hr	Hu	Lv	Ro	Hr	Hu	Lv	Ro	Hr	Hu	Lv	Ro	Hr, Hu, Lv, Ro
Entrepreneurial perceptions & attitudes	1												
Entrepreneurial activity	.506	-.638	.033	.745	1								
Entrepreneurship	.798	.729	.425	.714	.905	.062	.918	.673	1				
Innovation output	.167	.286	-.263	.249	-.672	-.665	.118	.559	-.373	-.248	.031	-.225	1

Hr – Croatia, Hu – Hungary, Lv – Latvia, Ro – Romania

In conformity with the correlation matrix (Table 2.) of the main variables and considering their value and sign, for the selected economies on the 2007-2011 time-lapse, several moderately significant patterns can be observed:

- for Croatia: a positive correlation of the entrepreneurial perceptions and attitudes with entrepreneurial activity (0.506) and with entrepreneurship (0.798), of entrepreneurial activity with entrepreneurship (0.905); respectively a negative association between entrepreneurial activity and innovation output (-0.672);
- in the case of Hungary: an acceptably good link between entrepreneurship and entrepreneurial perceptions and attitudes (0.729), but negative correlations between entrepreneurial activity and entrepreneurial perceptions, attitudes (-0,638), similarly as the case of entrepreneurial activity and innovation output (-0,665);
- regarding Latvia: a single positive and remarkable relation between entrepreneurial activity and entrepreneurship (0.918) is present, the rest of correlation being less important;
- considering Romania: a positive influence between the entrepreneurial perceptions, attitudes (0,714) and entrepreneurial activity (0,745), respectively with entrepreneurship, similarly between the entrepreneurial activity and entrepreneurship (0.673), or entrepreneurial activity and innovation output (0.559).

In order to test the validity of the research hypotheses simple linear regressions were imposed, by taking in consideration the significance level (p), the unstandardized value of the regression coefficient (β), calculated value of a t test (t). It is considered that a hypothesis is valid only if $p < 0.05$, β has high or relatively high values and t exceeds the critical value of the Student repartition, in our case 2.776445105 for 4 degree of freedom, because of five year data availability.

Table 3. Results of research hypotheses tested for Croatia

Hypothesis	R	R^2	β	t	p	Results
H_1	0.996	0.992	1.412363	22.38379	0.0000235	Valid
H_{1a}	0.997	0.995	1.604546	28.73818	0.0000087	Valid
H_{1b}	0.994	0.989	1.335489	19.74383	0.0000388	Valid
H_2	0.996	0.993	0.84759	24.82092	0.0000156	Valid
H_{2a}	0.996	0.993	0.96146	24.97923	0.0000152	Valid
H_{2b}	0.996	0.992	0.80204	23.41372	0.0000197	Valid
H_3	0.996	0.992	2.306073	23.47066	0.0000195	Valid
H_{3a}	0.998	0.996	2.620705	33.89936	0.0000064	Valid
H_{3b}	0.995	0.990	2.180221	20.15382	0.0000357	Valid

For Croatia, data analysis (Table 3.) highlighted positive significant influences for all the analysed hypotheses, thus $H_{1,1a,1b}$–$H_{3,3a,3b}$ being empirically validated. Consequently, (H_1) the overall entrepreneurial behaviour (as entrepreneurship) has positive effect on the innovation output, for the reason that

p<0.05, β has a relatively high value and t>2.776 (H_1: p=0.0000235, β=1.412363, t=22.38379); similarly entrepreneurship has positive effect on innovators (H_{1a}: p=0.0000087, β=1.604546, t=28.73818) and economic effects (H_{1b}: p=0.0000388, β=1.335489, t=19.74383). Furthermore, both the entrepreneurial perceptions and attitudes (H_2), respectively the entrepreneurial activity (H_3) have positive impact on the innovation output (H_2: p=0.0000156, β=0.84759, t=24.82092; H_3: p=0.0000195, β=2.306073, t=23.47066) and on its components, innovators (H_{2a}: p=0.0000152, β=0.96146, t=24.97923; H_{3a}: p=0.0000064, β=2.620705, t=23.41372) and economic effects (H_{2b}: p=0.0000197, β=0.80204, t=33.89936; H_{3b}: p=0.0000357, β=2.180221; t=20.15382).

In all the mentioned cases, a significant and highly influential (R>0.9) relation can be detected between the independent and dependent variables (R_1=0.996, R_{1a}=0.997, R_{1b}=0.994, R_2=0.996, R_{2a}=0.996, R_{2b}=0.996, R_3=0.996, R_{3a}=0.998, R_{3b}=0.995), while over the 98% of the dependent variable variation (R^2>0.989) owes to the cumulated influence of the independent variables variation (R_1^2=0.992, R_{1a}^2=0.995, R_{1b}^2=0.989, R_2^2=0.993, R_{2a}^2=0.993, R_{2b}^2=0.992, R_3^2=0.992, R_{3a}^2=0.996, R_{3b}^2=0.99).

For Hungary, data analysis (Table 4.) highlighted positive significant influences for all the projected hypotheses, thus $H_{1,1a,1b}$–$H_{3,3a,3b}$ being empirically validated. Consequently, (H_1) the overall entrepreneurial behaviour (as entrepreneurship) has positive effect on the innovation output, for the reason that p<0.05, β has a relatively high value and t>2.776 (H_1: p=0.000035, β=2.06563, t=20.26157); similarly entrepreneurship has positive effect on innovators (H_{1a}: p=0.000102, β=1.376491, t=15.45694) and economic effects (H_{1b}: p=0.000178, β=3.01138, t=13.41003).

Furthermore, both the entrepreneurial perceptions and attitudes (H_2), respectively the entrepreneurial activity (H_3) have positive impact on the innovation output (H_2: p=0.000771, β=0.733850, t=9.215064; H_3: p=0.000093, β=2.598342, t=15.824323) and on its components, innovators (H_{2a}: p=0.002661, β=0.480838, t=6.64613; H_{3a}: p=0.000133, β=1.734752, t=14.449341) and economic effects (H_{2b}: p=0.000236, β=1.087643, t=12.48501; H_{3b}: p=0.000373, β=3.780887, t=11.106408).

Table 4. Results of research hypotheses tested for Hungary

Hypothesis	R	R^2	β	t	p	Results
H_1	0.995	0.990	2.06563	20.26157	0.000035	Valid
H_{1a}	0.991	0.983	1.376491	15.45694	0.000102	Valid
H_{1b}	0.989	0.978	3.01138	13.41003	0.000178	Valid
H_2	0.977	0.955	0.733850	9.215064	0.000771	Valid
H_{2a}	0.957	0.916	0.480838	6.64613	0.002661	Valid
H_{2b}	0.987	0.974	1.087643	12.48501	0.000236	Valid
H_3	0.992	0.984	2.598342	15.824323	0.000093	Valid
H_{3a}	0.990	0.981	1.734752	14.449341	0.000133	Valid
H_{3b}	0.984	0.968	3.780887	11.106408	0.000373	Valid

In all the mentioned cases, a significant and highly influential ($R>0.9$) relation can be detected between the independent and dependent variables ($R_1=0.995$, $R_{1a}=0.991$, $R_{1b}=0.989$, $R_2=0.977$, $R_{2a}=0.957$, $R_{2b}=0.987$, $R_3=0.992$, $R_{3a}=0.990$, $R_{3b}=0.984$), while over the 91% of the dependent variable variation ($R^2>0.916$) owes to the cumulated influence of the independent variables variation ($R_1^2=0.990$, $R_{1a}^2=0.983$, $R_{1b}^2=0.978$, $R_2^2=0.955$, $R_{2a}^2=0.916$, $R_{2b}^2=0.974$, $R_3^2=0.984$, $R_{3a}^2=0.981$, $R_{3b}^2=0.968$).

Table 5. Results of research hypotheses tested for Latvia

Hypothesis	R	R^2	β	t	p	Results
H_1	0.989	0.979	0.710779	13.65697	0.000166	Valid
H_{1a}	0.524	0.274	0.149178	1.23358	0.284887	Not valid
H_{1b}	0.994	0.989	0.935419	19.06373	0.000044	Valid
H_2	0.988	0.977	0.457573	13.30956	0.000184	Valid
H_{2a}	0.533	0.285	0.097730	1.262967	0.275205	Not valid
H_{2b}	0.992	0.985	0.6015104	16.65987	0.000076	Valid
H_3	0.982	0.964	1.0779403	10.45031	0.000473	Valid
H_{3a}	0.509	0.259	0.221048	1.183151	0.302264	Not valid
H_{3b}	0.988	0.977	1.420697	13.17741	0.000191	Valid

For Latvia, data analysis (Table 5.) highlighted that (H_1) the overall entrepreneurial behaviour has positive effect on the current innovation output, for the reason that $p<0.05$, β has a relatively high value and $t>2.776$ (H_1: p=0.000166, β=0.710779, t=13.65697); similarly entrepreneurship has positive effect on economic effects (H_{1b}: p=0.000044, β=0.935419, t=19.06373). Furthermore, both components of entrepreneurship, the entrepreneurial perceptions and attitudes (H_2), respectively the entrepreneurial activity (H_3) have positive impact on the innovation output (H_2: p=0.000184, β=0.457573, t=13.30956; H_3: p=0.000473, β=1.0779403, t=10.45031) and on one of its components, namely economic effects (H_{2b}: p=0.000076, β=0.6015104, t=16.65987; H_{3b}: p=0.000191, β=1.420697, t=13.17741). In all the above mentioned cases, a significant and highly influential ($R>0.9$) relation can be detected between the independent and dependent variables ($R_1=0.989$, $R_{1b}=0.994$, $R_2=0.988$, $R_{2b}=0.992$, $R_3=0.982$, $R_{3b}=0.988$), while over the 96% of the dependent variable variation ($R^2>0.964$) owes to the cumulated influence of the independent variables variation ($R_1^2=0.979$, $R_{1b}^2=0.989$, $R_2^2=0.977$, $R_{2b}^2=0.985$, $R_3^2=0.964$, $R_{3b}^2=0.977$).

Contrasting the case of the other countries, for Latvia entrepreneurship has no significant influence on innovators (H_{1a}: p=0.284887, β=0.149178, t=1.23358) and similarly its components, the entrepreneurial perceptions and attitudes (H_{2a}: p=0.275205, β=0.097730, t=1.262967), respectively the entrepreneurial activity (H_{3a}: p=0.302264, β=0.221048, t=1.183151). Moreover, for these hypotheses, just a moderately significant relation ($R>0.5$) can be detected between the independent and dependent variables ($R_{1a}=0.524$, $R_{2a}=0.533$, $R_{3a}=0.509$), while just 28% of the dependent variable variation ($R^2>0.285$) owes to the cumulated influence of the independent variables variation ($R_{1a}^2=0.274$, $R_{2a}^2=0.285$, $R_{3a}^2=0.259$,).

Consequently, hypotheses H_1, H_{1b}, H_2, H_{2b}, H_3, H_{3b} were empirically validated, while H_{1a}, H_{2a}, H_{3a} were refuted. This highlight, on one hand, the general importance of entrepreneurship, of entrepreneurial perceptions and attitude, of entrepreneurial activity on the innovation output and on innovations economic consequences, while on the other hand an interesting empirically not significant, thus invalidated, hypotheses regarding innovators as dependent variables.

The result is somehow anticipatory, due to the low number of small and medium-sized firms in Latvia (2007: 71065, 2008: 77717, 2009: 67313, 2010: 7908, 2011: 71882), compared to Romania (2007: 472560, 2008: 518046, 2009: 511334, 2010: 523501, 2011: 535287) and Hungary (2007: 547808; 2008: 545768, 2009: 552188, 2010: 546894, 2011: 552688) as shown by the European Commission's Annual report on European SMEs. Moreover, for explanation should be considered the fact that in 2007, 2009 and 2010 there were no SMEs introducing product or process innovations and no SMEs introducing marketing or organisational innovations in conformity with the scores of the European Commission, Innovation Union Scoreboard 2010 and European Innovation Scoreboard 2009, 2007.

For Romania, data analysis (Table 6.) highlighted positive significant influences for all the proposed hypotheses, thus $H_{1,1a,1b}$–$H_{3,3a,3b}$ being empirically validated. Consequently, (H_1) the overall entrepreneurial behaviour (as entrepreneurship) has positive effect on the innovation output, for the reason that $p<0.05$, β has a relatively high value and $t>2.776$ (H_1: p=0.000936, β=1.15672, t=8.758162); similarly entrepreneurship has positive effect on innovators (H_{1a}: p=0.010753, β=0.60756, t=4.508364) and economic effects (H_{1b}: p=0.000466, β=1.37639, t=10.49252). Furthermore, both the entrepreneurial perceptions and attitudes (H_2), respectively the entrepreneurial activity (H_3) have positive impact on the innovation output (H_2: p=0.000115, β=1.06047, t=15.00111; H_3: p=0.000094, β=2.83398, t=15.75674) and on its components, innovators (H_{2a}: p=0.003458, β=0.57031, t=6.191926; H_{3a}: p=0.003305, β=1.52458, t=6.268343) and economic effects (H_{2b}: p=0.000044, β=1.25654, t=15.75674; H_{3b}: p=0.000032, β=3.35775, t=20.57192).

Table 6. Results of research hypotheses tested for Romania

Hypothesis	R	R^2	β	t	p	Results
H_1	0.974	0.950	1.15672	8.758162	0.000936	Valid
H_{1a}	0.914	0.835	0.60756	4.508364	0.010753	Valid
H_{1b}	0.982	0.964	1.37639	10.49252	0.000466	Valid
H_2	0.991	0.982	1.06047	15.00111	0.000115	Valid
H_{2a}	0.950	0.905	0.57031	6.191926	0.003458	Valid
H_{2b}	0.994	0.989	1.25654	19.08280	0.000044	Valid
H_3	0.992	0.984	2.83398	15.75674	0.000094	Valid
H_{3a}	0.952	0.907	1.52458	6.268343	0.003305	Valid
H_{3b}	0.995	0.990	3.35775	20.57192	0.000032	Valid

In all the mentioned cases, a significant and highly influential (R>0.9) relation can be detected between the independent and dependent variables (R_1=0.974, R_{1a}=0.914, R_{1b}=0.982, R_2=0.991, R_{2a}=0.950, R_{2b}=0.996, R_3=0.992, R_{3a}=0.952, R_{3b}=0.995), while over the 83% of the dependent variable variation (R^2>0.98) owes to the cumulated influence of the independent variables variation (R_1^2=0.950, R_{1a}^2=0.835, R_{1b}^2=0.964, R_2^2=0.982, R_{2a}^2=0.905, R_{2b}^2=0.989, R_3^2=0.984, R_{3a}^2=0.907, R_{3b}^2=0.990).

Conclusions

At the European Union level, the innovation and entrepreneurship theme has re-emerged in the context of the New Lisbon Strategy and Europe 2020 Strategy. Within the European competitiveness policies, innovation appears as solution to the extant problems in the economic, social and technological environment.

The conducted research for Romania, Hungary, Croatia and Latvia highlighted that an entrepreneurial behaviour stimulated by the general conditions of the national and entrepreneurial framework generate, in all the cases and at the same time, positive effects on innovation output, especially for the economic effects of the small and medium-sized firms activity. Towards instituting a more favourable business environment for research and development, at the level of the analysed countries, national action plans were developed in such a manner to include several general objectives subsumed to the European strategic objectives. National level objectives aims the increase of innovation capacity, technological development and research output assimilation into production, in order to improve the national economic competitiveness and boost life quality, having as specific objective the strengthening the firms' innovative capacity and consolidate their contribution to novel product and new market creation based on the working knowledge from the achieved results. In addition, at the small and medium-sized firms' level, modernising initiatives are needed for the European standardization, in order to promote the innovation procurement, to create a European market for intellectual property rights, so as to facilitate the access to private financing (European Commission, 2011, p. 12).

For Central and Eastern European countries, a research extension, which could lead to sharper results on the role of entrepreneurship on innovation output, requires the use of longer time series, the innovation output description with even more indicators and the inclusion in the research model of the large and established firms domestically and internationally manifested entrepreneurial behaviour.

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