

THE ROLE OF ENTREPRENEURSHIP IN PROMOTING INTERNATIONAL COMPETITIVENESS OF CEE COUNTRIES. A PANEL DATA APPROACH

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Abstract

The main objective of this paper is to analyse the relationship between entrepreneurial activity and the overall economic competitiveness for a set of four Central and Eastern European countries (Hungary, Latvia, Romania and Slovenia) members of the European Union. Also, this paper aims to identify if entrepreneurial motivations can influence the overall economic competitiveness. Our sample was created by selecting the information provided by Global Entrepreneurship Monitor and World Economic Forum. The analysed period was 2007-2016. To test our hypotheses, we used panel data estimation techniques. As dependent variable we considered the Global Competitiveness Index as proxy for the overall economic competitiveness of countries. And, as independent variables we used indicators measuring entrepreneurial activity and motivations. We also selected a set of control variables, represented by economic indicators considered enhancers of efficiency. Our results emphasize that the level and dynamics of entrepreneurial activity but also the motivations of individuals for becoming entrepreneurs are influencing the level of global competitiveness for the analysed CEE countries. Therefore, we show that countries with higher levels of opportunity entrepreneurs have higher levels of competitiveness and, on the other hand, the countries with more entrepreneurs motivated by necessity have lower levels of economic competitiveness.

Keywords: entrepreneurship, competitiveness, TEA (total entrepreneurial activity), GCI (global competitiveness index)

Introduction

The economic literature highlights the researchers' concerns about explaining the relationship between individual economic behaviours (entrepreneurial) and the economic context of entrepreneurial initiatives. These concerns, stemming from the Schumpeterian entrepreneurship model (Schumpeter, 1911), have intensified with the globalization of the market. This is because, in the context of business globalization, the global business environment, innovation and

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creativity are key ingredients in creating and sustaining the strategic advantage (Ojo *et al.*, 2017).

A deep knowledge and understanding of customer needs represents the basis to increase the efficiency and effectiveness of a business. This context requires an innovative process that ensures the survival of enterprises; therefore, the economic growth revolves around the active and inactive functions of the entrepreneur (McPherson, 1996).

Summing up the theoretical and empirical research results, it emerges the idea that obtaining higher levels of competitiveness depends on variables such as: *performance, welfare, efficiency, innovation and sustainability* (Herciu, 2013). In the context of globalization, competitiveness has been seen as a set of institutions, policies and factors that determine the level of productivity of a country (Sala-I-Martin *et al.*, 2009).

Various global organizations (WFE, GEM) periodically assess the competitiveness of different countries or regions of the world. Based on their reports, different aspects of entrepreneurial activities are analysed in direct relation with the business environment of a country or region. Their purpose was to provide entrepreneurs (and not only) with methods and tools for assessing the business environment (Veveře *et al.*, 2017).

As shown by several studies (Anastassopoulos, 2007), the enterprises and the environment in which they operate are important determinants of economic competitiveness. In this respect a competitive strategy and performance is necessary to be defined and applied.

The aim of our research is to analyse the correlation between entrepreneurial activity and the overall economic competitiveness for a set of four Central and Eastern European (CEE) countries (Hungary, Latvia, Romania and Slovenia) that are also members of the European Union. The country selection was based on data availability for the indicators measuring entrepreneurial activity and entrepreneurial motivations for the period considered in the analysis (2007-2016). For other CEE countries members of EU, data measuring entrepreneurial activity and motivations are only available for maximum 2 years and therefore impossible to include in the analysis. In addition, this paper aims to highlight whether entrepreneurial motivations (driven by opportunity or necessity) can have an impact on global competitiveness of countries.

To achieve the proposed objectives we used panel data estimation techniques, by applying multiple regression models to a set of panel data. For our panel data models, we have considered as dependent variable the Global Competitiveness Index as proxy for the overall economic competitiveness of countries. The independent variables considered are total early stage entrepreneurial activity, opportunity motivated entrepreneurship rate and necessity motivated entrepreneurship rate. We also use a set of control variables, represented by economic indicators considered enhancers of efficiency, namely: rate of economic growth and total tax rate. To get the most accurate results we use two different models: fixed effects model and random effects model, and we apply the Hausman test to see which model is more appropriate for our investigation.



In order to achieve our goals, the paper was structured as follows: the first section realizes an introduction to the research topic; the second section presents a brief review of the literature highlighting the relationship between entrepreneurship and international competitiveness identified by previous studies; the third section presents the research methodology describing the sample, the variables and also the methods used for the empirical investigation; the following section presents the results obtained and some discussions; the last section summarizes the conclusions.

Review of literature

The prosperity of economies is based on their ability to compete in global markets (Stajano, 2006). The nature and structure of entrepreneurial activities, as important mechanisms for economic development, varies from country to country, depending on „the relative volumes of opportunity and necessity entrepreneurship”. The researches have shown that the opportunity entrepreneurship has a significant positive effect on economic development, while necessity entrepreneurship has no effect (Acs and Varga, 2005).

Previous researches have shown that the dynamics of entrepreneurship depends primarily on the institutional context and the level of economic development (Acs *et al.*, 2008). Subsequently, on the background of deeper analyses, the structure and the level of entrepreneurship have been correlated with the simultaneous action of several determinants grouped into the following categories and subcategories (OECD, 2017): a) regulatory framework (bankruptcy, court and legal framework, product and market regulations, income taxes, wealth, business in capital taxes, patent system or standards); b) market condition (access to foreign market, degree and public involvement, private demand); c) access to finance (access to debt financing, access to venture capital, stock markets); d) creation and diffusion (R&D activities, transfer or non-commercial knowledge, co-operation among firms, technology availability and take-up); e) entrepreneurial capabilities (entrepreneurship educations, emigration); f) entrepreneurial culture.

Entrepreneurial activities (be they start-ups, new businesses or businesses already validated from a sustainability point of view) are positively associated with the economic development of a country (Rocha, 2004).

Global competitiveness indicates the extent to which enterprises show their sustainability and improve their performance. Through competitiveness, the level of economic development of a country is appreciated (Porter *et al.*, 2000). Global competitiveness depends both on the comparative advantages of each economy and on the regional contexts (Rugman *et al.*, 2011).

At the end of the twentieth century, competitiveness as a variable dependent on the economic evolution of a country was analysed on three stages (Porter, 1990; Porter *et al.*, 2002): (1) factor-driven stage, (2) efficiency-driven stage and (3) innovation-driven stage. Countries in the first stage are characterized by low yield cost (i.e., low added value), a preponderance of individual entrepreneurial activities, and inertia in innovation activity and a weak outward opening.

Countries in the second stage are concerned with increasing production efficiency, especially by specializing labour force; efficiency – based on economies of scale – puts pressure on and reduces the share of individual entrepreneurial activities. In this context, it is assumed that entrepreneurial activity decreases with the development of the economy (Kuznets, 1966; Schultz, 1988). The explanation is based on the size of the business that proves to be more efficient when capital replaces the workforce and moves to mass production. These changes lead to an increase in the productivity of wage labour compared to entrepreneurial work. Moreover, the development of the infrastructure of the economy (cross-border transport, telecommunications and financing / lending systems) benefits large firms and threatens small businesses. More recent research shows that while developed countries have lower entrepreneurial characteristics than developing countries, they have higher levels of global competitiveness than the latter (Pawitan *et al.*, 2017).

Countries in the third stage are highly innovative. This new economic environment is supposed to revive entrepreneurial activity; the main argument supporting this hypothesis is the migration of economic activities from the primary and secondary (production) sectors to the tertiary sector (thus increasing the share of services). Service providers are smaller than production and therefore offer more opportunities for entrepreneurship (Acs *et al.*, 2008). We therefore see a diversification of business, an increase in SMEs that have proved to be able to create new jobs, innovate and create social value (Singer *et al.*, 2015, p. 19).

For each of the three development stages, researchers have been concerned with identifying a global competitiveness index that measures long-term growth and prosperity and helps policy-makers identify the challenges that need to be addressed and the strengths should be considered when developing economic growth strategies (Schwab, 2017, p. 1). This Global Competitiveness Index (GCI) combines 114 determinants of long-term productivity and prosperity, grouped into 12 pillars: institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, commodity market efficiency, labour market efficiency, market size, business sophistication, and innovation. These pillars are, in turn, organized into three sub-indices whose weight in the calculation of the global index differs according to the development stage of each economy.

Putting forward the determinants of entrepreneurship and competitiveness, we notice that most of them have a double determination (see Table 1). For example, the determinants of entrepreneurship grouped generically in the „market conditions” category are also found to be the determinants of competitiveness (in the category „good market affluence” and „labour market efficiency” (see Table 2).

Based on these arguments, we accept the hypothesis that entrepreneurship and competitiveness depend on their common variables, and the intensity of correlation between their dynamics has particular aspects depending on the development stage of each economy.

The relationship between entrepreneurship (entrepreneurial development of the economy) and global competitiveness has concerned several researchers: Acs and Amorós (2008); Amorós *et al.* (2011); Audretsch *et al.* (2012); Cuckovic and Bartlett (2007); Huggins and Williams, (2011). They pointed out that there is a



direct relationship between entrepreneurship and competitiveness. Other authors associate entrepreneurial activity with knowledge and innovation, considering it a driving force of economic growth, job creation and increasing competitiveness (Guerrero *et al.*, 2006, Guerrero and Urbano, 2010, Marques *et al.*, 2010). This is because entrepreneurs, as agents of change, are critical to the innovation process, and entrepreneurial ability is a key element in the transfer of knowledge and the process of marketing it (Stefan *et al.*, 2012).

Table 1. The determinants of entrepreneurship and competitiveness

Determinants of entrepreneurship (OECD, 2017, pp. 138-142)	Pillars of competitiveness (World Economic Forum, 2017, Appendix A, pp. 322)
a) regulatory framework	1. institutions; 2. infrastructure; 3. macroeconomic
b) market condition	environment; 4. health and primary education; 5. higher
c) access to finances	education and training; 6. goods market efficiency; 7.
d) creation and diffusion	labour market efficiency; 8. financial market
e) entrepreneurial capabilities	development; 9. technological readiness; 10. market
e) entrepreneurial culture	size; 11. business sophistication; 12. Innovation

Table 2. The determinants about market

MARKET CONDITION (for entrepreneurship) (OECD, 2017, pp. 138-142)	EFICIENCY MARKET (for global competitiveness) (World Economic Forum, 2017, Appendix A, pp. 322)
Trading across borders	Domestic competition
Barriers to trade and investment	Foreign competition (prevalence of trade barriers; trade tariffs; prevalence of foreign ownership; business impact
Service trade restrictive index	of rules on FDI; burden of customs procedures; imports
Government enterprises and investment	as a percentage of GDP)
Licensing restrictions	Quality of demand conditions (degree of customer
Buyer sophistication	orientation, buyer sophistication)

Entrepreneurial eco-system is at the heart of competitiveness, productivity, innovation and economic growth (Grilo and Thurik, 2005). Small and medium-sized enterprises and entrepreneurship are essential sources of dynamism, innovation and flexibility in developed economies as well as in emerging and developing economies (Ortega-Argilés, Potters and Voigt, 2009).

Studies show that the economic environment – where economic and investment policy decisions are being made – has undergone significant changes that fundamentally change the context in which political decisions are made to stimulate economic growth. For example, through the latest study, WEF (2017, p. vii) signals new important challenges for economic progress, such as: financial vulnerabilities (which are a threat to competitiveness, innovation and technology); innovation (which increasingly attracts the attention of emerging economies);

labour market flexibility and worker protection (as important variables of competitiveness in the fourth industrial revolution).

Research methodology

The panel of data regarding economic competitiveness of countries and entrepreneurial activity was created by selecting the information provided by the World Economic Forum, GEM Key indicators (2017) and World Bank data Bank (2017). In order to achieve the main objective of our research, namely to test if the global competitiveness of CEE countries depends on the level of entrepreneurial activity and on entrepreneurial motivations (i.e. opportunity or necessity), we apply panel data regression models. Our sample includes only four Central and Eastern European countries, namely: Hungary, Latvia, Romania and Slovenia, because only for these countries were available data for the indicators measuring entrepreneurial activity and entrepreneurial motivations and covering the entire period considered. For the other Central and Eastern European countries members of the European Union the indicators measuring entrepreneurial activity and motivations have data only for one or two years. The analysed period includes ten years, between 2007 and 2016.

The variables considered for our model, the expected relationship between the variables and the hypothesis that we want to test are presented in table 3 below.

Table 3. Description of the variables used in the analysis and their measurement

Variable (abbreviation)	Measurement
Global economic competitiveness (GCI)	expressed by the Global Competitiveness Index which is calculated as a weighted average of different aspects of competitiveness and takes scores from 1 to 7
Total early stage entrepreneurial activity (TEA)	the percentage of working age population who either actively involved in starting a new business or are running a new business that is less than 42 months old.
Opportunity motivated entrepreneurship rate (OER)	the percentage of TEA which indicates that their main driver for becoming entrepreneur is the opportunity of being independent, or increasing their income, as opposed to finding no other option for work or just maintaining their income.
Necessity motivated entrepreneurship rate (NER)	the percentage of TEA which becomes entrepreneurs because they had no other option for work
Control variables	
Rate of economic growth (GDP)	annual % growth of Gross Domestic Product (GDP)
Total tax rate (TAX)	as % of commercial profits

Source: processed by the authors



Therefore, we consider as dependent variable of our models the *global economic competitiveness* (GCI) of each country, which is expressed by the Global Competitiveness Index provided by the World Economic Forum (WEF). WEF calculates GCI individual for each country as a weighted average of different aspects of competitiveness. Schwab and Sala-i-Martin (2017) describe each one of the twelve pillars of competitiveness (see table 1) which are also grouped into three sub-indexes: basic requirements, efficiency enhancers, and innovation and sophistication factors. Each sub-index has allocated a different weight in the calculation of the global index, depending on the stage of development of the economy. The GCI is measured by scores from 1 to 7 (a lower average score means a lower degree of competitiveness).

The independent variables used are: total early stage entrepreneurial activity (TEA), opportunity motivated entrepreneurship rate (OER) and necessity motivated entrepreneurship rate (NER). The GEM methodology, defines TEA rate as the percentage of working age population who either actively involved in starting a new business or are running a new business that is less than 42 months old. In order to measure entrepreneurial motivations, we consider another two indicators used by GEM Key indicators: the opportunity motivated entrepreneurs (OER) and the necessity motivated entrepreneurs (NER). The OER usually represents the entrepreneurs that start a business for reasons of profit, innovation, and the desire of being independent and are related to innovative activities (McMullen *et al.*, 2008; Stenholm *et al.*, 2013; Cullen *et al.*, 2014). On the other hand, NER represents the entrepreneurs that start a new business because they had no other option for work (Shane, 2009; Valdez and Richardson, 2013; Amorós *et al.*, 2017).

The relationship between a country's competitiveness and entrepreneurial activities have been analysed in the literature by several authors: Acs and Amorós (2008), World Economic Forum (2015), Pawitan *et al.* (2017). They emphasized that when the competitiveness of an economy is rising the entrepreneurial activity is decreasing, while in less competitive economies usually the levels of entrepreneurial activity are higher. This because higher competitiveness can determine the creation of new or better paid jobs and will reduce the willing of individuals to become entrepreneurs.

Starting from those presented above we formulated the following hypothesis:

Hypothesis 1: Countries with higher levels of overall TEA will have lower levels of economic competitiveness

Thus, higher levels of entrepreneurship will not determine an increase of economic competitiveness, so, we must pay attention also to the quality of entrepreneurship, and to mention that quality entrepreneurship is very important for the development of an economy, and the innovative entrepreneurs are seen as agents helping markets development and implicitly the increase of economic competitiveness. Usually, the entrepreneurs motivated by opportunity are the ones that apply innovative business techniques, thus an increase of the share of opportunity

entrepreneurs will result in higher levels of innovative entrepreneurial activities. As shown by previous studies (Amorós *et al.*, 2012; Petrakis and Konstantakopoulou, 2015) the improvement of the quality of entrepreneurial activity from a country, and especially the increase of innovative activities carried out by entrepreneurs, are key factors for increasing economic competitiveness. Other studies (Ciocanel and Pavelescu, 2015; Doğan, 2016) have also demonstrated empirically that the national competitiveness can be raised by increasing innovation performance of businesses. In the same note, The Global competitiveness Reports (Schwab, 2017) through the pillars considered in calculating the global competitiveness index (the Innovation capacity pillar and the Business dynamism pillar) mention the significant role played by innovative entrepreneurship for achieving the economic competitiveness of a country. Thus, in our study we associate innovative entrepreneurs with opportunistic entrepreneurs and we expect that a growing share of entrepreneurs motivated by opportunity will be associated with increased levels of economic competitiveness. And, for countries with a large number of motivated entrepreneurs, who are especially looking for a living income and are rarely interested in innovative activities, we expect to get low levels of competitiveness. Therefore, we formulate the following two hypotheses:

Hypothesis 2: Countries with higher levels of OER will have higher levels of economic competitiveness

Hypothesis 3: Countries with higher levels of NER will have lower levels of economic competitiveness.

We also use a set of control variables, represented by economic indicators considered enhancers of efficiency, namely: rate of economic growth and total tax rate. The data for control variables are gathered from World Bank data bank (2017). The influence of *GDP growth* (annual % growth) on competitiveness has been tested by a series of authors. Therefore, the studies of Podobnik *et al.* (2012), Dobrinsky and Havlik (2014) and Korez-Vide and Tominc (2016) showed a positive functional dependence between GCI as proxy for competitiveness and GDP as proxy for economic growth. Their conclusions highlighted the fact that richer countries are more competitive than poor countries, showing a functional dependence between GCI and GDP.

The level of total tax rate (as % of commercial profits) is another macroeconomic determinant of competitiveness. As shown by (Summers, 1988) the impact of alternative tax reforms is significant for the international competitiveness, excessive tax burdens are usually blamed for the poor international performance of industries. In the same note, other authors (Miller and Kim, 2008; Knoll, 2010) show that high corporate tax rates undermine the international competitiveness of countries. The reduction of the total tax rates could help the competitiveness of a country by attracting more investments that might stimulated the productivity of the firms.



In order to test the effects of the level of entrepreneurship and of entrepreneurial motivations on international competitiveness we apply econometric models. After testing all the variables considered in the analysis (by applying the Augmented Dickey-Fuller test), we analyse the descriptive statistics to identify and describe the main characteristics of the data analysed, and the correlations between variables. Finally, we run the panel data regression analysis by applying different models according to each dependent variable. To be able to identify the best model fitted to our data we apply fixed effects models and also the random effects models.

The models estimated are the following (i- is for the country, t – is for the year):

$$GCI_{it} = \beta_0 + \beta_1 TEA_{it} + \beta_2 GDP_{it} + \beta_3 TAX_{it} + \alpha_i + \varepsilon_{it} \quad (1)$$

$$GCI_{it} = \beta_0 + \beta_1 OEA_{it} + \beta_2 GDP_{it} + \beta_3 TAX_{it} + \alpha_i + \varepsilon_{it} \quad (2)$$

$$GCI_{it} = \beta_0 + \beta_1 NEA_{it} + \beta_2 GDP_{it} + \beta_3 TAX_{it} + \alpha_i + \varepsilon_{it} \quad (3)$$

Where: i represents the countries (HU, LV, RO, SI), t expresses each year considered in the analysis from 2007 to 2016, β_0 is the intercept, $\beta_{1,2,3}$ are the coefficients of the independent and control variables, α_i represents the stable characteristics of the countries and ε_{it} defines the error term of the regression models.

We have to emphasize that there might exist also a reverse relationship between some of the considered variables. For example, some studies (Acs and Amoros, 2008; Amoros *et al.* 2012; World Economic Forum, 2015) have tested if the global competitiveness index influences the level of total entrepreneurial activity and have showed that in more competitive economies the early-stage entrepreneurial activity is lower, while in less competitive economies are registered higher rates of total entrepreneurial activity. The presence of this reverse relationship is a main limit of our empirical analysis.

Our study uses the logical-constructive method and compares the theoretical notions with empirical data. Benchmarking is used to estimate country indicators in the sample and to compare them. The graphical method allows for visual visualization and subsequent analysis.

Results and discussion

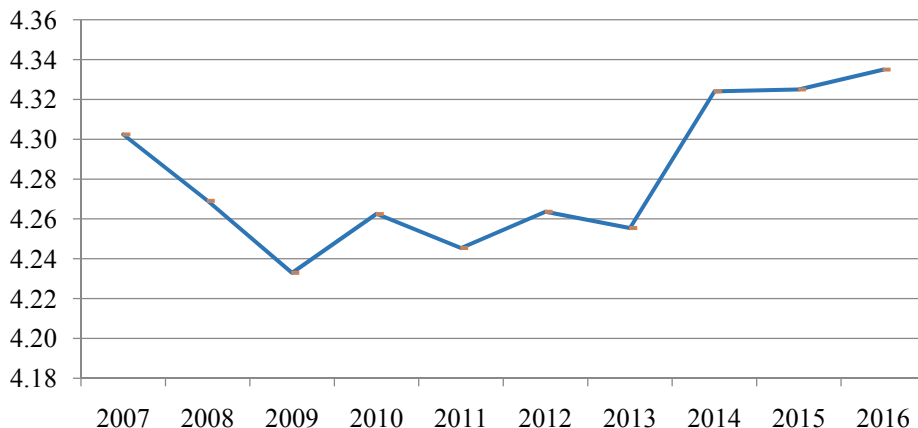
Using graphical method, we observe the evolution of the Global competitiveness index of CEE countries. As seen in figure 1, the economic competitiveness of CEE countries was affected by the recent financial crisis and the following economic down-turn. The lowest level of GCI in CEE countries was registered in 2009 and the highest in 2016. In 2014, the competitiveness of CEE countries registered a big improvement.

When testing the variables for the unit root, we found that several variables had a unit root: global competitiveness index, opportunity motivated entrepreneurship rate and total tax rate, and we calculate their first difference.



Also, in order to obtain accurate results after the regression analysis we also applied the correlation test, and we took into consideration the problem of multicollinearity. The results of the correlation matrix are presented in Table 4. For our variables we did not obtained a high correlation coefficient. We consider as reference point for a high correlation between variables the value of the coefficient of 0.70.

Figure 1. The evolution of Global competitiveness index in the four CEE countries considered in the analysis, between 2007 and 2016.



Source: authors own calculations using the data from WEF

The specialized literature does not consider a unitary value for expressing a high correlation. Some studies (Kennedy, 2008) consider that correlation is high when its value is above 0.80 or 0.90, while other studies (Anderson *et al.*, 1990; Bryman and Cramer, 2001) state that there exists multicollinearity when the correlation coefficient is higher than 0.70 or 0.80. Therefore, our results highlight the existence of a moderate correlation between TEA, OEA and NEA, that is why we use separate regression models for each variable. We also obtained a moderate correlation between TAX and OEA and NEA, but the coefficient has the value under 0.50 and it does not affect the accuracy of our results, in accordance with the studies mentioned above.

The summary of the descriptive statistics for all the variables considered in our analysis is presented in Table 5 below. Our results emphasize the fact that the global competitiveness index (GCI) data are distributed between a minimum level of 3.9 (in Romania, 2007) and a maximum of 4.5 (in Slovenia, 2009). The value of standard deviation shows only very small variations of this index between the four CEE considered countries and also for the period analysed.



Table 4. The correlation matrix for all the variables considered in the analysis

Variable/probability	GCI	TEA	OEA	NEA	GDP	TAX
GCI	1.000					

TEA	0.085	1.000				
	<i>0.610</i>	-----				
OEA	0.570	-0.095	1.000			
	<i>0.000</i>	<i>0.568</i>	-----			
NEA	-0.597	0.237	-0.723	1.000		
	<i>0.000</i>	<i>0.150</i>	<i>0.000</i>	-----		
GDP	0.166	-0.017	-0.162	-0.115	1.000	
	<i>0.318</i>	<i>0.918</i>	<i>0.330</i>	<i>0.489</i>	-----	
TAX	-0.300	-0.023	-0.488	0.419	-0.047	1.000
	<i>0.066</i>	<i>0.890</i>	<i>0.001</i>	<i>0.008</i>	<i>0.775</i>	-----

Note: p-values are in italic

Source: authors own calculations

The level of total entrepreneurial activity varies between a minimum of 3.6% of the population able to work (in Slovenia, in 2011) to a maximum of 14.1% (in Latvia, in 2016). The opportunity motivated entrepreneurs registered the highest variation, and are distributed between 29.1% (Hungary, 2011) and 76% (Slovenia, 2007). The necessity motivated entrepreneurs also have a high level of standard deviation, and are distributed between a minimum of 7.3% (Slovenia, 2012) and 41.3% (Romania, 2011). Therefore, there are obtained substantial cross-country variations.

Table 5. Summary of descriptive statistics

Variable	Obs.	Min.	Max.	Mean	Std. deviation
GCI	40	3.971	4.552	4.281	0.136
TEA	38	3.654	14.190	7.994	3.008
OEA	38	29.160	76.070	47.289	10.967
NEA	38	7.364	41.322	23.393	7.993
GDP	40	-14.401	9.979	1.211	4.609
TAX	40	31.000	56.600	41.162	7.609

Source: authors own calculations

As regards the control variables, we obtained significant variations for total tax rate but also for GDP. Thus, the lowest levels of total tax rates measured as percentage of commercial profits were registered in Slovenia (in 2014-2016, 31%) while the highest levels were obtained in Hungary (in 2009, almost 57%). The lowest level of economic growth, a negative one of -14%, was registered in Latvia (in 2009) and the highest, of almost 10% in Latvia (in 2007). These results, are confirming once again that the recent financial crisis had seriously affected the Central and Eastern European countries, their level of economic development, the

entrepreneurial activity but also the level of international competitiveness of the economies.

Performing a more detailed comparative analysis of the descriptive statistics we can concluded that international competitiveness is higher in the countries with lower levels of total entrepreneurial activity. Also, as regards entrepreneurial motivations, the international competitiveness is higher in the countries with lower levels of necessity entrepreneurs and higher levels of opportunity motivated entrepreneurs.

Table 6. Determinants of global competitiveness index

Variables	Model 1		Model 2		Model 3	
	Fixed effects	Random effects	Fixed effects	Random effects	Fixed effects	Random effects
TEA	0.015** (0.194)	0.003 (0.058)	-	-	-	-
OEA	-	-	0.004** (0.001)	0.007*** (0.001)	-	-
NEA	-	-	-	-	-0.004 (0.003)	-0.009*** (0.002)
GDP	0.008*** (0.005)	0.004*** (0.005)	0.008*** (0.001)	0.007*** (0.002)	0.005*** (0.001)	0.002*** (0.002)
TAX	0.012*** (0.003)	-0.005*** (0.001)	0.433 (0.005)	0.002 (0.001)	0.003 (0.003)	-0.001 (0.001)
Adj-R²	0.4528	0.1200	0.4334	0.3403	0.4302	0.3140
F-stat.	6.104***	2.546***	5.718***	7.364***	5.657***	6.645***

Note: we use *, ** and *** in order to indicate the significance levels, respectively 10%, 5% and 1%, Standard errors in parenthesis.

Source: authors' own calculations

Based on the results obtained after running the panel data regression analysis, we want to highlight which is the impact of the changes in the level of entrepreneurial activity and entrepreneurial motivations on the level of international competitiveness of countries. For the empirical analysis we have adopted the Pooled Least Square method. The serial correlation in the residuals and the suspicion of the existence of transversely heteroskedasticity has been accounted for by using White cross section method to determine the variance-covariance matrix. The White cross section method is derived from the treatment of the pool regression as a multivariate regression. We apply two versions of the panel data regression models: Fixed effects model (FE) and Random effects model (RE), comparing their results in Table 6. Our empirical findings confirm the three hypotheses formulated above and are in line with the findings of previous studies (Acs and Amorós, 2008; Amorós *et al.*, 2012; World Economic Forum, 2015; Petrakis and Konstantakopoulou, 2015; Ciocanel and Pavelescu, 2015; Doğan, 2016; Pawitan *et al.*, 2017). Our results come to complete the previously obtained results by highlighting the significant role played by the increase of the quality of



entrepreneurial activity in increasing economic competitiveness of developing countries. As we have seen from our data base, in developing countries the share of necessity motivated entrepreneurs is higher than the share of the entrepreneurs motivated by the necessity. By presenting the role played by innovative entrepreneurship, and sustaining our affirmations with these empirical results, we consider that we can show why it is important that the decision makers from developing countries to support opportunity motivated entrepreneurs, especially those using innovative techniques (introducing new products to the market, new production techniques or new business techniques, etc.).

In the following we analyse the empirical results obtained for each regression model. Therefore, for Model 1 (where the dependent variable is total early-stage entrepreneurial activity rate) we obtained different results when applying different models. For the case of the Fixed effects model TEA rate, GDP growth and total tax rate appear to be positively and statistically significant correlated with global competitiveness index. In the case of Random effects model only GD growth is positively and statistically significant correlated with GCI, while total tax rate is negatively related.

For Model 2 the dependent variable is opportunity motivated entrepreneurship rate. Here, we found similar results regardless of the model considered (fixed effect or random effects). Therefore, opportunity motivated entrepreneurs are positively and statistically significant related with global competitiveness index. A positive and statistically significant relation was also obtained in the case of GDP growth.

The results obtained for model 3 (where the dependent variable is necessity motivated entrepreneurs), differ a little. So, necessity motivated entrepreneurs are negatively and statistically significant related to global competitiveness index only for the random effect model. While, GDP growth is positively related with GCI regardless of the model (fixed or random effects).

The results obtained for the F test are statistically significant at 1% level value for all the analysed models, and shows the relevance of the considered models for investigating the relationship between entrepreneurship, entrepreneurial motivations and global economic competitiveness. However, we notice that the models could be improved by including also other variables as determinants of economic competitiveness, because the values obtained for R-Squared Adjusted indicate that only between 30 and 45% of the variance of Global competitiveness index (even less for TEA and Random effects model 12%) it can be explained through the variance of entrepreneurial activity level of entrepreneurial motivations. This is a limitation of our study which we intend to overcome in future research on this theme.

To identify which one of the two analysed models (namely fixed effects model or random effects model) is more appropriate for interpreting our empirical results we apply the Hausman test. Through this test we formulate two hypotheses H_0 = random effects and H_1 = fixed effects. The results obtained after applying the Hausman test for each one of our models are summarized in Table 7. We run the Hausman test for each model in part, but, because we obtained the same results we



presented only one table. The results show that differences across countries do not affect the relationships between variables. This is a somewhat expected result because the analysed countries are CEE countries (Hungary, Latvia, Romania and Slovenia) and have similar degrees of development, with no major differences between their economic development levels. Therefore, the random effects model is more appropriate for the interpretation of our empirical results.

Table 7. Results for the Hausman test

Correlated Random Effects – Hausman Test			
Equation: Model			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	3	1.0000

Source: authors own calculations

We therefore might conclude that for Central and Eastern European countries the level of total early stage entrepreneurial activity is not significantly influencing the economic competitiveness. But, the entrepreneurial motivations are significant determinants of competitiveness. An increase in the level of opportunity motivated entrepreneurs has a positive effect on economic competitiveness because a significant part of this entrepreneurs are interested in gaining more money thus they try to be innovative and to create new products on the market therefore stimulating competitiveness. On the other hand, the increase in the level of necessity motivated entrepreneurs determines a reduction of the international competitiveness of countries, because, these individuals decide to become self-employed in the absence of other ways of gaining their incomes, and are just interested in ensuring their living. They are not usually interested in innovative business activities and do not help the development of the competitiveness of business sector. Moreover, usually increased levels of necessity entrepreneurs are a sign of lower economic development, higher tax rates or inflation rates.

The level of economic growth is positively and strongly correlated with global competitiveness in all the case. But total tax rate is negatively related with competitiveness only in the model considering Total early stage entrepreneurs as dependent variable.

We have to keep in mind that the analysis was realized only for Central and Eastern European countries and these results might be of this form because of the specifics of these economies, as former socialist countries. It is possible that when analysing more developed European economies to obtain different results.

Conclusions

European Competitiveness Reports published by the European Commission describe a competitive economy as being that economy that has a consistently high rate of productivity growth, and mentions that economic competitiveness of a



country depends on the performance of SME sector, on the growth and employment potential of these firms. To be competitive, a country has to outperform its competitors in terms of research and innovation, entrepreneurship, competition, education and training. When a country has high rates of economic growth, which can ensure a constant increase in real wages, will be able to promote and sustain the domestic firms on the world market but also would help the creation of new jobs. Under these circumstances, that country can be considered as having a competitive economy.

The originality of our research results from analysing the relationship between entrepreneurship and entrepreneurial motivations and the level of economic competitiveness for a group of Central and Eastern European countries. Our empirical results have shown the different effects of entrepreneurial activity on economic competitiveness according to the motivation of individuals. Therefore, we consider that the results of our research should be of interest to policymakers, who should be concerned about identifying the best policies to sustain entrepreneurs motivated by opportunity which help the increase of competitiveness for their countries. Several measures that could be adopted by the decision makers in order to support innovative entrepreneurship are: providing easy access to funding schemes to help and support entrepreneurs in incipient stages (and not only) which have innovative ideas, facilitating procedures to create a new business through reducing the number of procedures needed, the number of days and start-up costs, using various instruments to encourage entrepreneurs to apply innovative production techniques and also ensuring access to entrepreneurial education. We generally refer to measures to improve the business and economic environment so as to provide opportunities for obtaining significant earning from the entrepreneurial activity. Most new entrepreneurs on the market are small and medium-sized enterprises and, in order to avoid doing business just for obtaining living income and being interested in applying innovative procedures in their work, they must benefit from an economic environment well coagulated offering opportunities for innovative business ideas. Thus, we have first tested the relationship between the level of total early stage entrepreneurial activity on the global competitiveness index in four Central and Eastern European countries which are also members of the European Union. The results obtained show that in our case the changes in the level of entrepreneurial activity do not have any influence on the international competitiveness of countries. Then we concluded that is not sufficient to raise the level of entrepreneurial activity in order to increase competitiveness. So, we deepened the analysis by considering the entrepreneurship rates grouped by the motivation of entrepreneurs: opportunity or necessity. Our results confirmed our expectations and highlighted a positive relationship between opportunity motivated entrepreneurs and economic competitiveness and a negative influence from the necessity motivated entrepreneurs. In the countries where are increasing the level of entrepreneurs motivated by opportunity the economic competitiveness is rising, because the motivation of this entrepreneurs is to gain more money thus they try to be innovative and to create new products on the market therefore stimulating competitiveness. In the countries where are registered



increase levels of entrepreneurs motivated by necessity is registered a reduction of the international competitiveness of the economy, because, these individuals decide to become entrepreneurs for survival reasons and their activities do not help the development of the market.

In conclusion we consider that every country has to work on the development of those determinant factors of competitiveness that are the most important for increasing their international image. However, it is worth noting that all competitiveness pillars are important and their effects are interrelated, thus a country should not focus only on increasing the innovative entrepreneurship and neglect the development of the others.

The key limitation of our research is related to the fact that data availability has limited the analysis over a period of time that corresponds to a period of financial crisis and also to a post-recession period and therefore the results cannot be generalized. The study could be extended in two directions: intensive (by expanding the analysis on other relevant factors of competitiveness, in order to compare the results with international data) and extensive (by extending the analysed period and the number of analysed countries). In future studies we intend to enhance the analysis by including the relationships between entrepreneurship and competitiveness, by adding also other indicators measuring different aspects of entrepreneurship, especially of innovative entrepreneurship, but also some other factors within each group of the pillars of competitiveness. Also, when including other countries in the analysis we might obtain different results, because of the specifics of the CEE economies, as former socialist countries.

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References

- Acs, Z.J., Desai, S. and Hessels, J. (2008), Entrepreneurship, economic development and institutions, *Small Business Economics*, 31(3), pp. 219-234.
- Acs, Z.J. and Varga, A. (2005), Entrepreneurship, agglomeration and technological change. *Small Business Economics*, 24(3), pp. 323-334.
- Acs, Z.J. and Amorós, J.E. (2008), Entrepreneurship and competitiveness dynamics in Latin America, *Small Business Economics*, 31(3), pp. 305-322.
- Amorós, J.E., Ciravegna, L., Mandakovic, V. and Stenholm, P. (2017), Necessity or opportunity? The effects of State fragility and economic development on entrepreneurial efforts, *Serie Working Papers*, 2017(42), pp. 1-39.
- Amorós, J.E., Fernández, C. and Tapia, J. (2012), Quantifying the relationship between entrepreneurship and competitiveness development stages in Latin America, *International Entrepreneurship and Management Journal*, 8(3), pp. 249-270.



- Anastassopoulos, G. (2007), Countries' International Competitiveness and FDI: An Empirical Analysis of Selected EU Member-Countries and Regions, *Journal of Economics and Business*, 10(1), pp. 35-52.
- Anderson, D.R., Sweeney, D.J. and Williams, T.A. (1990), *Essentials of Statistics for Business and Economics*, Cincinnati: South-Western College Publishing.
- Audretsch, D.B., Link, A.N. and Peña, I. (2012), Academic entrepreneurship and economic competitiveness: introduction to the special issue, *Economics of Innovation and New Technology*, 21(5-6), pp. 427-428.
- Bryman, A. and Cramer, D. (2001), *Quantitative Data Analysis with SPSS Release 10 for Windows: A Guide for Social Scientists. Revised Edition*, London: Routledge.
- Ciocanel, A.B. and Pavelescu, F.M. (2015), Innovation and competitiveness in European context, *Procedia Economics and Finance. Emerging Markets Queries in Finance and Business*, 32, pp. 728-737.
- Cuckovic, N. and Bartlett, W. (2007), Entrepreneurship and Competitiveness: The Europeanisation of Small and Medium-sized Enterprise Policy in Croatia, *Southeast European and Black Sea Studies*, 7(1), pp. 37-56.
- Cullen, J.B., Johnson, J.L. and Parboteeah, K.P. (2014), National rates of opportunity entrepreneurship activity: Insights from institutional anomie theory?, *Entrepreneurship Theory and Practice*, 38(4), pp. 775-806.
- Dobrinisky, R. and Havlik, P. (2014), *Economic convergence and structural change: The role of transition and EU accession*. Wiener Institut für Internationale Wirtschaftsvergleiche (retrieved from <http://wiiw.ac.at/economic-convergence-and-structural-change-the-role-of-transition-and-eu-accession-dlp-3357.pdf>).
- Doğan, E. (2016), The Effect of Innovation on Competitiveness, *Ekonomi ve İstatistik Sayı*, 24, pp. 60-81.
- Global Entrepreneurship Monitor (2017), *GEM key indicators* (retrieved from <http://www.gemconsortium.org/data/keyindicators>).
- Global Entrepreneurship Monitor (2018), *Global report 2017/18*, (retrieved from <https://www.gemconsortium.org/report>).
- Grilo, I. and Thurik, R. (2005), Latent and Actual Entrepreneurship in Europe and the US: Some Recent Developments, *The International Entrepreneurship and Management Journal*, 1(4), pp. 441-459.
- Guerrero, M., Rialp, J. And Urbano, D. (2006), The impact of desirability and feasibility on entrepreneurial intentions: A structural equation model, *International Entrepreneurship and Management Journal*, 4(1), pp. 35-50.
- Guerrero, M. and Urbano, D. (2010), The development of an entrepreneurial university. *The Journal of Technology Transfer*, 37(1), pp. 43-74.
- Herciu, M. (2013), Competitivitatea internațională a economiei naționale: analiză, experiențe și perspective, in: Otiman, I., Ionescu, C. and Dinga, E. (eds.), *Studii post-doctorale în economie, vol. V, Studii și cercetări privind impactul globalizării asupra structurii și dinamicii economiilor*, București: Editura Academiei Române.
- Huggins, R. and Williams, N. (2011), Entrepreneurship and regional competitiveness: The role and progression of policy, *Entrepreneurship & Regional Development*, 23(9-10), pp. 907-932.

- Kennedy, P. (2008), *A Guide to Econometrics, 6th edition*, Cambridge: Wiley-Blackwell.
- Knoll, M. (2010), The Corporate Income Tax and the Competitiveness of U.S. Industries. *Tax Law Review*, 63, pp. 771-957.
- Korez-Vide, R. and Tominc, P. (2016), Competitiveness, Entrepreneurship and Economic Growth, in: Trapezyński, P., Puślecki, L. and Jarosiński M. (eds.), *Competitiveness of CEE Economies and Businesses*, Springer International Publishing, pp. 25-44.
- Kuzents, S. (1966), *Modern economic growth*. New Haven: Yale University Press.
- Marques, C.S., Ferreira, J., Rodrigues, R.G. and Ferreira, M. (2010), The contribution of yoga to the entrepreneurial potential of university students: a SEM approach, *International Entrepreneurship and Management Journal*, 7(2), pp. 255–278.
- McMullen, J.S., Bagby, D. and Palich, L.E. (2008), Economic freedom and the motivation to engage in entrepreneurial action, *Entrepreneurship Theory and Practice*, 32(5), pp. 875–895.
- McPherson, M.A. (1996), Growth of micro and small enterprises in Southern Africa, *Journal of Development Economics*, 48(2), pp. 253-277.
- Miller, T. and Kim, A. (2008), High Corporate Taxes Undermine U.S. Global Competitiveness, *Web Memo: The Heritage Foundation*, 2065 (retrieved from <https://www.heritage.org/trade/report/high-corporate-taxes-undermine-us-global-competitiveness>).
- OECD (2017), *Entrepreneurship at a Glance 2017*, Paris: OECD Publishing.
- Ojo, O.D., Petrescu, M., Petrescu A.G. and Bilcan, F.R. (2017), Impact of innovation on the entrepreneurial success: Evidence from Nigeria, *African Journal of Business Management*, 11(12), pp. 261-265.
- Ortega-Argilés, R., Potters, L. and Voigt, P. (2009), R&D – intensive SMEs in Europe: What Do We Know about Them?, *European Commission-JRC*, 15.
- Pawitan, G., Nawangpalupi, C. and Widyarini, M. (2017), Understanding the relationship between entrepreneurial spirit and global competitiveness: implications for Indonesia, *International Journal of Business and Society*, 18(S2), pp. 261-278.
- Petrakis, P.E. and Konstantakopoulou, D.P. (2015), Entrepreneurship Opportunities and Future Competitive Advantage, in: Petrakis, P.E. and Konstantakopoulou, D.P. (eds.) *Uncertainty in Entrepreneurial Decision Making. The Competitive Advantages of Strategic Creativity*, New York: Palgrave Macmillan, pp. 45-58.
- Podobnik, B.M., Horvatić, D., Kenett, D. and Stanley, H.E. (2012), The competitiveness versus the wealth of a country, *Scientific Reports*, 2(678), pp. 1-7.
- Porter, M.E. (1990), *The competitive advantage of nations*, New York: Macmillan.
- Porter, M.E., Sachs, J.D., Forum, W.E., Schwab, K., Warner, A.M., Cornelius, P.K. and Levinson, M. (2000), *The Global Competitiveness Report 2000*. New York: Oxford University Press.
- Porter, M., Sachs, J. and McArthur, J. (2002), Executive summary: Competitiveness and stages of economic development, in: Porter, M., Sachs, J., Cornelius, P.K., McArthur, J.W. and Schwab, K. (eds.), *The global competitiveness report 2001–2002*, New York: Oxford University Press, pp. 16–25.



- Rocha, H.O. (2004), Entrepreneurship and Development: The Role of Clusters, *Small Business Economics*, 23(5), pp. 363-400.
- Rugman, A.M., Oh, C.H. and Lim, D.S.K. (2011), The regional and global competitiveness of multinational firms, *Journal of the Academy of Marketing Science*, 40(2), pp. 218-235.
- Sala-I-Martin, X., Blanke, J., Drzeniek Hanouz, M., Geiger, T. and Mia, I. (2009), *The Global Competitiveness Index 2009-2010. Contributing to Long-Term Prosperity amid the Global Economic Crisis*, Geneva: World Economic Forum.
- Schultz, T. (1988), Education investment and returns, in: Chenery, H. and Srinivasan, T.N. (eds.), *Handbook of development economics*, Amsterdam/New York: North-Holland, pp. 543-630.
- Schumpeter, J.A. (1911), *Theorie der wirtschaftlichen Entwicklung, Eine Untersuchung über Unternehmergewinn, Kapital, Kredit, Zins und den Konjunkturzyklus*, Duncker und Humblot: Berlin; translated by Redvers Opie, 1934 & 1963. *The Theory of Economic Development: an Inquiry into Profits, capital, credit, Interest and the Business Cycle*, Oxford: Oxford University Press.
- Schwab, K. (2017), *The Global Competitiveness Report 2017-2018*, Geneva: World Economic Forum.
- Shane, S. (2009), Why encouraging more people to become entrepreneurs is bad public policy, *Small Business Economics*, 33(2), pp. 141-149.
- Singer, S., Amorós, J.E. and Arreola, D.M. (2015), *Global Entrepreneurship Monitor 2014 Global Report*, Mexico, Monterrey: Global Entrepreneurship Monitor Association.
- Stajano, A. (2006), *Research, quality, competitiveness: European Union Technology Policy for the information society*, New York: Springer.
- Stefan, D., Comes, C.A., Szabo, Z.K. and Herman, E. (2012), Innovative Entrepreneurship for Economic Development in EU, *Procedia Economics and Finance*, 3(12), pp. 268-275.
- Stenholm, P., Acs, Z.J. and Wuebker, R. (2013), Exploring country-level institutional arrangements on the rate and type of entrepreneurial activity, *Journal of Business Venturing*, 28(1), pp. 176-193.
- Summers, L. (1988), Tax Policy and International Competitiveness, in: Frenkel, J.A. (ed.), *International Aspects of Fiscal Policies*, Chicago: University of Chicago Press, pp. 349-386.
- Valdez, M.E. and Richardson, J. (2013), Institutional determinants of macro-level entrepreneurship, *Entrepreneurship: theory and practice*, 37(5), pp. 1149-1175.
- Veveř, V., Zvirgzdina, R. and Linina I. (2017), Indexes as Business Environment Characterizing Instruments, *European Integration Studies*, 11(1), pp. 220-232.
- World Bank (2017), *World development indicators* (retrieved from <http://data.worldbank.org/data-catalog/worlddevelopment-indicators>).
- World Economic Forum (2015), *Leveraging Entrepreneurial Ambition and Innovation: A Global Perspective on Entrepreneurship, Competitiveness and Development* (retrieved from: http://www3.weforum.org/docs/WEFUSA_EntrepreneurialInnovation_Report.pdf).

