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Measures of the Impact of Entrepreneurship on Economic Development in Romania

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Entrepreneurship has attracted the attention of many scholars in the last years due to its importance in the economy. Entrepreneurship is considered by many an important factor that could have a positive influence over the economic growth. Despite the recognition of the role of the entrepreneurship there is no general agreement of how entrepreneurship impacts the economy or a specific industry. The aim of this article is to provide some information about entrepreneurship, ways of measuring entrepreneurship, most common metrics used and the impact over the Romanian economy. To underline the relationship between these concepts some analysis were conducted in order to determine if they are correlated.

Keywords: *entrepreneurship, economic development, total entrepreneurial activity*

JEL Classification: *M13, L26, O10*

1. Introduction

The importance of entrepreneurship for economic growth in contemporary economies is widely recognized by economists, as well as by specialists in many fields as well as by governments (van Stel, 2006).

For over a decade, the European Commission is working towards stimulating the creation of new businesses throughout the entire European Union, the 2003 Green Paper states that the challenge for the EU is to identify key factors that can help to create an environment in which entrepreneurial activities grow and develop. EU policies should be geared towards encouraging entrepreneurship and helping businesses to grow (EC, 2003). Many researchers emphasize the importance and role of entrepreneurship in the economy; Audretsch (2003) stated that "entrepreneurship has become an engine for economic and social development around the world."

As stated in the Global Entrepreneurship Monitor (GEM, 2008) – Executive report 2008 – (Bosma et al., 2009) there is broad agreement on the importance of entrepreneurship for economic and social development. Entrepreneurs drive innovation: they contribute to structural changes in the market thereby and put pressure on old existing businesses to shape up, and by doing they are making an indirect contribution to productivity (Raposo and Paço, 2011).

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Understating the role of entrepreneurship in the process of growth requires to better understand and defining the concept of entrepreneurship (Wennekers, S. and R. Thurik, 1999), because the proof on whether entrepreneurship matters for economic growth is not unequivocal (Naude, 2013).

2. Operationalization. Measuring entrepreneurship.

An interesting and important aspect is related to the operationalization, respectively the transposition of theoretical concepts into measurable empirical variables. Entrepreneurship is considered to be important for a national economy as mentioned above, but despite the attention this domain attracted in the last period there is no unanimously accepted definition and a coherent definition of entrepreneurship has not yet emerged (Iversen et al, 2007).

Having no widely accepted way to define the entrepreneurship makes the operationalization of entrepreneurship a challenge. In the following part I will rather focus on presenting, some of the indicators for measuring entrepreneurship, than on metrics for economic growth and development. The later have been discussed more in detailed in the literature.

Regarding the operationalization in the literature, the operationalization of the concept of entrepreneurship at different levels of aggregation is encountered: individual, firm, industry, region and nation (Audretsch and Keilbach, 2006; Carree and Thurik, 2010).

There are different measures for entrepreneurship in the literature; some measures have been particularly prevailing. These are: new firm formation, early-stage entrepreneurship, self-employment, necessity entrepreneurship, and opportunity entrepreneurship. Other types of measurement are also used in order to capture growth entrepreneurship, which are also very relevant (Desai, 2017). In the quest to quantify and measure entrepreneurship, a number of indicators were chosen to capture this concept; the most used indicators encountered in the review of the literature are, according to Parker (2009):

- Creating new entrepreneurial initiatives (firms). New businesses and nascent entrepreneurs
- Small and medium-sized businesses - SMEs
- Self-employed workers and business owners

Each of these indicators above comes with a number of advantages and disadvantages when used to capture entrepreneurship and its links with other concepts. So because there is no “ideal” dependent variable for entrepreneurship, selecting a right dependent variable is very important (Davidsson and Gordon, 2011).

2.1. Creating new entrepreneurial initiatives (firms). New businesses and nascent entrepreneurs

Associating entrepreneurship with identifying market opportunities and creating new businesses (launching new initiatives) is a standard practice in recent studies (Shane and Venkataraman, 2000).

Such variables are used in many studies to measure entrepreneurship and its impact, one of the most well known ones being the one launched by the Global Entrepreneurship Research Association (GERA). The project is called Global Entrepreneurship Monitor (GEM) and it is one of the world’s biggest study on entrepreneurship. GEM developed an indicator called “Total early-stage entrepreneurial activity” (TEA) that focuses on the phase that combines the stage before the start of a new firm (nascent entrepreneurship) and the stage directly after the start of a new firm (owning-managing a new firm). Taken together is defined as “Total early-stage entrepreneurial activity” (TEA). (Reynolds et al., 2005; Bosma et al., 2012).

Even if it is a useful indicator in the comparison between countries, because the above-mentioned study gathers data from over 60 countries (in 2016, 65 economies participated in the study and 62 economies in 2015), it has some limitations.

Perhaps the most important limitation is related to the fact that many of the new initiatives started and materialized in a company are mostly small imitative businesses (Parker, 2009) and not entrepreneurial initiatives, the way Schumpeter defined it, that of innovation that will lead to creative destruction into a domain. These types of business that are not entrepreneurial according to the Schumpeterian concept are also included in the above-mentioned indicator.

From the early-stage entrepreneurship rate indicator, businesses older than 42 months (three-and-a-half years) are also excluded, which eliminates the possibility of mid-to-long-term analysis of business growth and exit strategy. Some authors consider growth and exit of business important aspects for entrepreneurship. This could be considered another limitation of this type of indicator.

2.2. Small and medium-sized businesses or SMEs

Another approach is to delineate entrepreneurship is to associate it with the number of small and medium enterprises (SME’s) in an economy. Such measurements date from the 1980s. (Parker, 2009). Such a

definition of entrepreneurship has the advantage of being easy to measure, but it also has the advantage of data availability on categories of firms because most states collect data on firms on various size categories.

If the main advantage is data availability and the possibility of comparing data internationally, such a measurement also has drawbacks. Lately, fewer and fewer researchers consider entrepreneurship is synonymous with SMEs. But problems also arise in the international comparison because not all national statistical institutes collect data in the same way and do not always have the same criteria for defining small firms. At EU level, however, there is some standardization of the criteria a firm must meet to be considered SMEs.

Table 1. *Definition of SMEs in the European Union*

Company category	Employees	Turnover
Micro	<10	< 2 million €
Small	<50	<10 million €
Medium - sized	<250	<50 million €

Source: Annual report on European SME's 2015/2016

"But not all entrepreneurs run small and medium companies, and not all small companies are run by an entrepreneur" (Holtz-Eakin, 2000). Even though SMEs and entrepreneurship are not two perfectly congruent concepts, it should be noted that many entrepreneurial initiatives are materialized through a company and most of the times it is one that can be classified as a SME, fewer business ideas materialize directly into a large company, it usually start small and evolves into a big venture.

2.3. Self-employed persons and business owners

Self-employment is another possible measure for entrepreneurship. The reasoning for which self-employed workers are used as a measure of entrepreneurship is related to the fact that entrepreneurship is considered an activity involving risk and uncertainty (Parker, 2009). Because entrepreneurs do not have an employer (with the exception of intrapreneurs) and take the risk for the business, such a measure can be used.

An advantage of using self-employed numbers is given by the fact there is a lot of internationally collected data regarding this indicator (e.g. OECD has been collecting such data internationally for more than 30 years). Thus, due to the availability of data on self-employed workers, this indicator provides one of the easiest entrepreneurial measurements that can be operationalized in empirical research (Katz, 1990).

In order to highlight the importance of self-employed workers, Parker (2009) brings some arguments such as: the fact that about 10% of the workforce in most OECD countries is self-employed and many of the employees in industrialized economies say they would like to be workers on their own. In the study conducted by the European Commission (Flash Eurobarometer, 2012) about 48% of respondents in Romania responded that they would prefer self-employed status.

A difficulty in using this indicator is that not all countries define self-employees in the same way, so when doing calculations inaccuracies might appear due to this fact. Another aspect is that self-employed workers do not count or take into consideration always the nascent entrepreneurs. But nascent entrepreneurs are a part of early stage phase of new businesses creation, a process considered important for entrepreneurship analysis by researchers in the field.

Also, those who work on the black market (shadow economy) are not captured by this indicator. In Romania, especially in the 90's, this was a real and major problem on the Romanian workforce. A lot of small business are family operated and some family members who work for the firm, are not listed on the official payroll. In terms of measuring the economic impact one of the most used measures for economic performance is economic growth. For measuring economic growth, the most commonly used indicators are: GDP (Gross Domestic Product) growth and GDP per capita, the increase in the number of jobs, productivity growth.

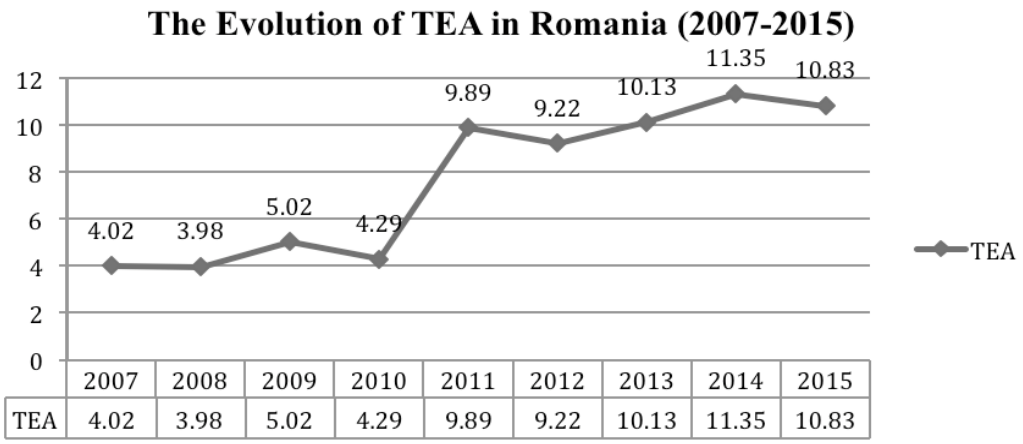
3. Analysis based on Secondary Data

Due to the fact that entrepreneurship is beleived to play an important role for the economic developmetn of an economy, i tried to to see if there is a relation between entreprenurship and economic grothw, to find out if there is some evidence that entreprenurship an positive impact on the Romanian economy.

I used as a measure for entreprenruship the indacator developed by GEM, the "Total early-stage entrepreneurial activity" TEA. For the economic impact I used GDP per capita. The analized period consists of 9 consectuive years between 2007 and 2015. 2015 was the year with the most recent avalible data for TEA. For economic development I choose the GDP per capita indicator as measured by the World Bank. The data used related to entreprenruship was taken from the GEM data base Adult Population Survey (APS) and the

data related to GDP from World Bank (World Bank national accounts data, and OECD National Accounts data files).

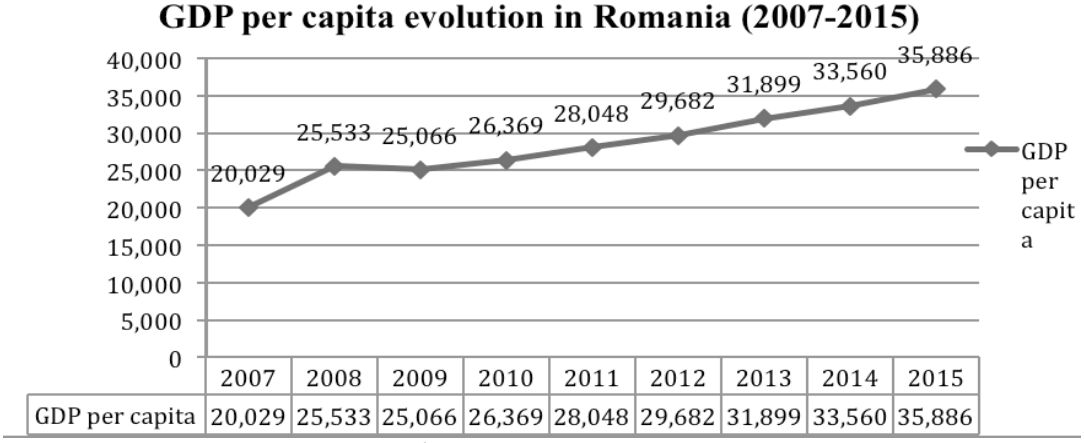
The TEA metric evolution has shown a growing trend in Romania for the period ranging from 2007 to 2015, the biggest increase can be seen in TEA can be seen from 2010 to 2011 (see figure 1).



	2007	2008	2009	2010	2011	2012	2013	2014	2015
TEA	4.02	3.98	5.02	4.29	9.89	9.22	10.13	11.35	10.83

Figure 1. *TEA evolution for Romania 2007-2015.*
Source: own calculations based on GEM database

The GDP per capita exhibits a growing trend in Romania for the analyzed period (2007-2015); just in 2009 there is slight decrease of the value compared with the previous year (see figure 2). GDP is expressed in local currency.



	2007	2008	2009	2010	2011	2012	2013	2014	2015
GDP per capita	20,029	25,533	25,066	26,369	28,048	29,682	31,899	33,560	35,886

Figure 2. *GDP per capita*
Source: own calculations based on World Bank database

I runned several analysys in order to find out if there exist some corralations between entreprenurship (TEA) and GDP per capita. The first step was to run a correlation (Pearson) between TEA and GDP per capita and then a linear regression between these two series.

The Pearson correlation coefficient yields an R value of about 0.87 (0.87377). According to Colton's empirical rules (1974), a correlation coefficient of between 0.75 and 1 indicates a good to strong correlation between the two variables.

In the context of the analysis it can be stated that there is a direct and positive correlation between the Total early-stage entrepreneurial activity and the GDP per capita in Romania. Thus this data and the first results of the research, backed by the statistical relationship, confirm the existence of a link between the two variables, TEA and GDP per capita in Romania for the analized period.

Then I contiunued the analysys by running a simple linear regression between the two variables (TEA and GDP per capita) over the period 2007 - 2015 (9 years) to observe the intensity of the link between the two variables. The independet variable or the explanatory variable was TEA and the dependent variable or the explained variable was GDP per capita.

The "R squared" (r^2), meaning the coefficient of determination, reflects the proportion of the variance in the dependent variable that is predictable from the independent variable. The r^2 coefficient is a measure of how well the variation of one variable explains the variation of the other, and corresponds to the percentage of the variation explained by a regression.

The linear regression performed between the two previously mentioned variables generated a coefficient of r^2 of 0,76347 (see appedinces for detailed results).

These values show us that there is a link between the two analyzed variables. Approximately 75% of the variation proportion of dependence is explained by the regression model. The total early-stage entrepreneurial activity has an impact on GDP per capita in Romania in the analyzed period (2007-2015). The remaining 25% is explained by other variables not counted for in this regression, with just two variables, the simple linear regression is just the first step before going more in-depth with future analysis, building more advanced models that include multiple variables, using multivariate regression methods. Quoting Naude: a "closer scrutiny of the relationship between entrepreneurship and economic development is therefore needed" (Naude, 2013).

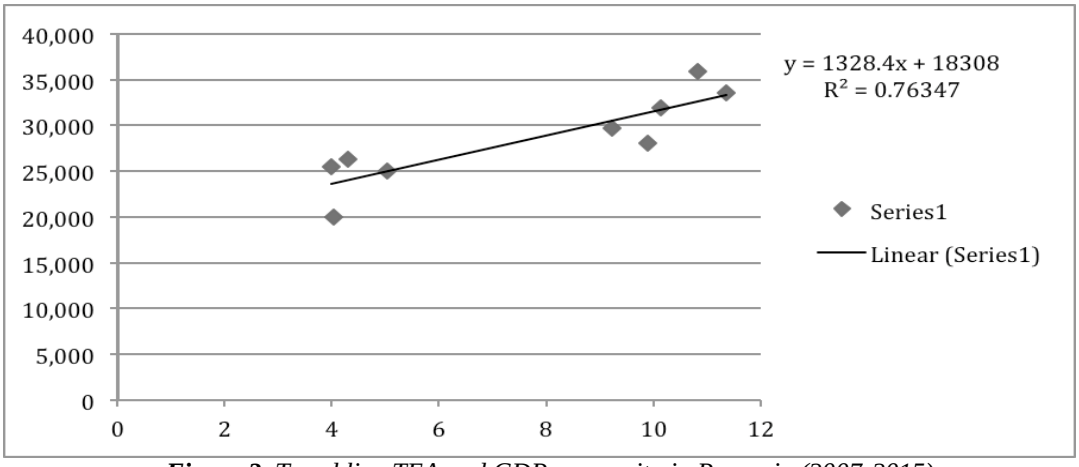


Figure 3. *Trend line TEA and GDP per capita in Romania (2007-2015)*
Source: own calculations

4. Conclusions

At the beginning of the article I presented a short review of the literature regarding ways of operationalizing for entrepreneurship and some connections between entrepreneurship and economic growth, a review, which is not, intended to be exhaustive but rather to serve as an introduction for future more detailed analysis.

I have tried to emphasize that the role of entrepreneurship and its contribution to economic development is widely recognized. But due to the fact that there is no generally accepted definition of the term entrepreneurship and because it is a multidisciplinary concept, it is hard to be quantified into metrics that be used in analyzes. Besides affirmation regarding that entrepreneurship has a positive impact over an economy it is needed to run different analysis so that have solid evidence on the claims about the links between entrepreneurship and growth and development. The connection between entrepreneurship and economic development is not always obvious and strait forward.

At the end, i have run some analysis using statistically tools; I have use correlations and regressions to determine if there are some links between entrepreneurship in and growth economical. I used as measure for entrepreneurship the Total early-stage entrepreneurial activity (TEA) metric developed by GEM Consortium and for capturing the economic growth I used GDP per capita, data collected from the World Bank statics.

The results show a strong correlation between TEA and GDP per capita, and regression analysis generated results that might support the affirmation that entrepreneurship has a positive impact over the growth of GDP and over economic growth in general.

Even if the statistical tools used for the analysis were not among the most complex, they still highlight that entrepreneurship is influencing the GDP per capita.

Of course such results must be interpreted with caution, taking into account the limitations presented above, and require a more in-depth analysis of the thematic using multi-varied regression models to identify

other variables that contribute to economic growth and development, and see which ones play an important role besides the used in this analysis.

Taking into account the importance of entrepreneurship for economy, a more complex and determined approach is needed using more powerful and varied analysis methods to highlight the effects of this entrepreneurship on the national economy.

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Appendices

Appendix 1. Correlation Coefficients Matrix

Sample size	9	*Critical value (2%)*	2.99795
		TEA	*GDP per capita*
TEA	**Pearson Correlation Coefficient**	*1.*	
	R Standard Error		
	t		
	p-value		
	H0 (2%)		
GDP per capita	**Pearson Correlation Coefficient**	*0.87377*	*1.*
	R Standard Error	*0.03379*	
	t	*4.75335*	
	p-value	*0.00208*	
	H0 (2%)	*rejected*	

R	
Variable vs. Variable	*R*
GDP per capita vs. TEA	0.87377

Appendix 2. Linear Regression Statistics

Regression Statistics	
R	0.87377
R Square	0.76347
Adjusted R Square	0.72968
Standard Error	2,535.03572
Total Number Of Cases	9
GDP per capita = 18308.0792 + 1328.3761 * TEA	

ANOVA					
	d.f.	*SS*	*MS*	*F*	*p-level*
Regression	1.	145,200,475.46696	145,200,475.46696	22.59435	0.00208
Residual	7.	44,984,842.75526	6,426,406.10789		
Total	8.	190,185,318.22222			

	Coefficients	*Standard Error*	*LCL*	*UCL*	*t Stat*	*p-level*	*H0 (2%) rejected?*
Intercept	18,308.07919	2,295.35212	11,426.72469	25,189.43368	7.97615	0.00009	*Yes*
TEA	1,328.37607	279.46093	490.56572	2,166.18642	4.75335	0.00208	*Yes*
T (2%)	2.99795						

Note: *LCL - Lower value of a reliable interval (LCL), UCL - Upper value of a reliable interval (UCL)*

Residuals			
Observation	*Predicted Y*	*Residual*	*Standard Residuals*
1	23,648.15099	-3,619.15099	-1.52623
2	23,595.01595	1,937.98405	0.81726
3	24,976.52706	89.47294	0.03773
4	24,006.81253	2,362.18747	0.99615
5	31,445.71852	-3,397.71852	-1.43285
6	30,555.70656	-873.70656	-0.36845
7	31,764.52878	134.47122	0.05671
8	33,385.14759	174.85241	0.07374
9	32,694.39203	3,191.60797	1.34593