Entrepreneurial Business and Economics Review

2022, Vol. 10, No. 2

10.15678/EBER.2022.100201

Entrepreneurial activity and economic growth: A dynamic data panel analysis of European countries

Sofia Gomes, Pedro Ferreira

ABSTRACT

Objective: The goal of this article is to analyse the impact of different measures of entrepreneurial activity, namely through attitudes and behaviour, on the economic growth of 21 European countries. The goal is to assess the impact of entrepreneurial activity, measured by perceived capabilities, perceived opportunities, entrepreneurial activity, and total early stage, on the economic growth of these countries.

Research Design & Methods: This study is based on a quantitative methodology and uses a data panel covering 21 European countries and a period from 2001 to 2019 (196 observations). A statistical analysis of the dependent, independent and control variables was performed, panel data stationarity analysis was carried out, and three multiple linear regression models were estimated using the generalized method of moments (dynamic panel data).

Findings: The results suggest that the entrepreneurial activity driven by the opportunity has a positive impact on the gross domestic product per capita and, as such, stimulate the economic growth of the European countries considered in this sample. However, entrepreneurial activity at an early stage and the skills and knowledge to start a new business have a negative impact on the economic growth of these countries.

Implications & Recommendations: In general, this study suggests that entrepreneurship driven by opportunity (directly or indirectly by perceived capacities) is a key factor in stimulating the European countries' economic growth considered in this sample.

Contribution & Value Added: This study complements the existing literature that analyses the impact of entrepreneurship on economic growth, but using a sample of countries in Europe (there are few empirical studies for this purpose on European countries), and it is innovative because three different measures of entrepreneurial activity are tested, a more generic one and two other measures of entrepreneurial behaviour and attitudes collected by the global entrepreneurship monitor (GEM) to assess their impact of entrepreneurship on countries' economic growth.

Article type:	research article
Keywords:	perceived capacity; perceived opportunity; entrepreneurship; economic growth; European countries
JEL codes:	L26, O47, O52

Received: 9 April 2021 | Revised: 3 December 2021 | Accepted: 14 January 2022

Suggested citation:
Gomes, S. & Ferreira, P. (2022). Entrepreneurial activity and economic growth: A dynamic data panel analysis of European countries. *Entrepreneurial Business and Economics Review,* 10(2), 7-20. https://doi.org/10.15678/EBER.2022.100201

INTRODUCTION

In recent years, the role of entrepreneurship as a driver of economic growth in countries and regions has been emphasized, arousing the growing interest of several authors. The first difficulty when studying a phenomenon like entrepreneurship is defining the concepts of entrepreneurship and entrepreneur but also finding a reliable, robust, comprehensive, and comparable measure of countries' entrepreneurial activity (Pittaway, 2005).

Based on the definitions found in the literature that bring together the greatest theoretical consensus among the authors, we can define entrepreneurship as an activity of innovating through a process of creative destruction (Schumpeter, 1911), the discovery of information that allows the detection of business opportunities (Kirzner, 1973) in environments of uncertainty and risk (Knight, 1921). Thus, in general terms, entrepreneurship can be understood as the intention or action aiming to generate value through products, new methods or through new businesses. In this context, the entrepreneur is the individual who develops the entrepreneurial activity, bearing risks, uncertainties and business opportunities.

If capturing the dimension of entrepreneurship and entrepreneurship in a single definition is difficult, it is even more challenging to find a measure, in empirical terms, of entrepreneurship that is robust and efficient and that allows countries to be compared in terms of entrepreneurial activity since there are numerous definitions of entrepreneurship, several international databases that collect different measures and dimensions of entrepreneurial activity, making comparison difficult.

Over time, several empirical studies have been carried out that place entrepreneurship as an important antecedent of economic growth at country level (Amorós, Fernández, & Tapia, 2012; Ács, 2006; Audretsch, 2007; Ács & Naudé, 2011; Carlsson *et al*., 2009; Baumol & Strom, 2007; Minniti & Lévesque, 2010; Hessels & Van Stel, 2011; Stam & Van Stel, 2011; Olaison & Meier Sørensen, 2014). However, there is no consensus among authors on the results of this impact, which may vary according to the macroeconomic condition of the countries (usually expressed by the gross domestic product per capita) and the variables used to measure entrepreneurial activity. In this context, our study aims to measure the impact of entrepreneurial activity measured through entrepreneurial behaviour and attitudes variables collected by GEM on the economic growth of 21 European countries (from 2001 to 2019, with European countries being selected according to data availability. The goal is to assess the impact of entrepreneurial activity, measured by perceived capabilities, perceived opportunities, entrepreneurial activity, and total early stage, on the economic growth of these countries. For this purpose, this study uses a quantitative methodology based on a panel of data composed of the aforementioned variables collected for 21 countries in Europe in the period 2001 to 2019. In terms of methods, a statistical analysis was carried out on the dependent and independent variables and three multiple linear regression models were estimated by the generalized method of moments, with cross section weights.

This study, in addition to complementing the existing literature that analyses the impact of entrepreneurship on economic growth, also contributes to further understanding of the relevance of entrepreneurship for economic growth of countries in two ways: (1) few studies use a sample of European countries (Stoica & Roman, 2020) and (2) three measures of entrepreneurial activity were used, one of the most classic measures (total early-stage entrepreneurial activity) and two other innovative measures related to entrepreneurial behaviours and attitudes (perceived opportunity and perceived capacity) as measures of entrepreneurship to assess their impact on economic growth of the European countries considered.

This study is structured as follows: firstly, a brief review of the literature on the relationship between entrepreneurship and economic growth is presented; next, there is the presentation of the data, variables and methodology used; then, the results of the statistical and econometric analyses performed and the results are discussed, and in the final section, there are the conclusions and recommendations for future studies.

LITERATURE REVIEW (AND HYPOTHESES DEVELOPMENT)

Over time, entrepreneurship has been measured in quantitative terms, through the self-employment rate (Carree & Thurik, 2008; Mojica, Gebremedhin & Schaeffer, 2009) or by the percentage of own businesses (except for the agricultural sector) as a function of the total workforce (Carree *et al*., 2007; Li *et al*., 2012; Deller, 2007) and the number of new companies created, the latter measure being widely used by several authors as the main measure of entrepreneurial activity (Alheet, 2019; Baptista, Escárcia & Madruga, 2004; Ács & Szerb, 2010; Fritsch, 2004; Gries & Naudé, 2010; Carree & Thurik, 2008; Bosma, Stam & Schutjens, 2006; Hartog, Parker, Van Stel & Thurik, 2010; Bosma, Erik & Schutjens, 2006; Mariet Ocasio & Mariet Ocasio, 2016 Hessels & Van Stel, 2011). However, several criticisms

have arisen since reducing entrepreneurial activity to the creation of new companies does not include, for example, innovation, the identified opportunity, entrepreneurial capacities, motivations and motivational appetite to undertake, being limited only to results of the entrepreneurial activity and not to the causes that motivated the action to undertake. This measure of entrepreneurship has proved to be very reductive (Baliamoune-Lutz, 2015) because, for entrepreneurial activity, it is not mandatory to have to create a new company since entrepreneurship can occur within existing companies (without the need for new companies are created) as a result of a new idea or business opportunity.

According to Wong *et al*. (2005), the use of a quantitative measure of entrepreneurship such as the rate of creation of new companies results from the difficulty of obtaining better measures that can be tested econometrically to assess the impact of entrepreneurship on economic growth, which in turn is measured, for example, through the Gross Domestic Product per capita (GDP per capita). In order to overcome the limitations of business creation as a quantitative measure of entrepreneurship and its impact on economic growth, GEM measured business creation through four indicators widely used by several authors (Ács & Szerb, 2010; Wong *et al*., 2005; Stam *et al*., 2007; Martin & Picazo, 2008; Amoros, 2007; Thurik, 2009; Audrestsch, 2007; Naudé, 2008):

1. Total entrepreneurial activity (TEA) index: percentage of individuals (in relation to the adult population, between 18-64 years old) creating a new business or owning/managing an existing start-up business up to 3.5 years, that is, they have been paying wages, salaries and other payments for more than three months, but less than 3.5 years ago (includes self-employed or self-employed workers).
2. Nascent entrepreneurial activity index: percentage of people (in relation to the adult population between 18-64 years old) actively involved in starting a business as owners or co-owners (this business does not yet pay salaries, salaries and other payments).
3. Young firm entrepreneurial activity index: percentage of people in relation to the adult population between 18-64 years old) owning/managing a new business with at least three months, and no more than 3.5 years, that is, a business that pays wages, salaries and other payments for more than three months and less than 3.5 years,
4. Established businesses activity index – percentage of people (in relation to the adult population between 18-64 years old) owning/managing a business that has at least 3.5 years and pays salaries, wages and other payments.

Even though there is consensus in the literature about the potential impact of entrepreneurship on countries' economic growth (Baumol & Strom, 2007; Minniti & Lévesque, 2010; Ács & Naudé, 2011; Stam & Van Stel, 2011; Amorós, Fernández, & Tapia, 2012; Audretsch, 2007; Carlsson *et al*., 2009; Hessels & Van Stel, 2011; Walstad, & Thomas, 2007; Olaison & Meier Sørensen, 2014; Doran *et al*. 2018), the dimension of its effect is not consensual. This impact depends on the growth stage of the economy under analysis (Bosma *et al*., 2009; Gries & Naudé, 2010; Ferreira *et al*., 2017), the same measures being possible entrepreneurs have different economic results, whether they are developed or developing countries (Valliere & Peterson, 2009). In general, entrepreneurship can drive economic growth in countries by diversifying the offer of products and/or services, increasing competition (opening up to new markets and increasing efficiency) with positive externalities for families, of knowledge spillovers, job creation, increased innovation and productivity, increased company efficiency, stimulating creative destruction, with the replacement of less competitive and innovative companies, among others (Audretsch & Keilbach, 2004; Fritsch, 2008).

Nevertheless, the results are not unanimous. Studies have concluded that entrepreneurial activity has a greater positive impact in developed countries when compared with developing countries (Stam *et al*., 2011), but for other authors, entrepreneurship has a greater positive impact on low-income countries than high-income countries (Stam *et al*., 2011). Taking into account the assumption that depending on countries' stage of development, entrepreneurship may produce different results regarding countries' economic growth, several authors have examined this relationship by distinguishing developed economies from developing economies (Bosma *et al*., 2009; Gries & Naudé, 2010; Hashi & Krasniqi, 2011; Avnimelech, Zelekha, & Sharabi, 2014; Marcotte, 2014; Ferreira *et al*., 2017), instead of using a single country data panel, regardless of their stage of development.

Although previous research establishes a connection between entrepreneurship and economic growth, some authors (Audretsch, 2007 and Audretsch & Keilbach, 2004) point out omissions in the neoclassical model of economic growth that was based on the factors of production – the connection of labour and capital to product, including, with a positive impact, the concept of entrepreneurial capital in economic growth models. Entrepreneurial capital contemplated the number of start-ups per capita, initial activity in an information and communication technology company, that is, entrepreneurial capital encompassed all factors that facilitated the start of new businesses and positively influenced the economic environment. Other authors, such as Ács and Vargas (2005), have empirically tested the impact of research and development and human capital, finding a positive influence on economic growth. Moreover, Hessels and Van Stel (2011) showed that companies with export guidance have a positive influence on entrepreneurship and are an additional contribution to economic growth.

But even with the use of more quantitative measures, they are still not enough to measure the impact of entrepreneurship on economic growth, with GEM recognizing this limitation (Bosma, 2013) and revising its model. In this review, the concept of entrepreneurship was reformulated, having introduced three essential components (Bosma *et al*., 2009), which the GEM also started to collect:

- Attitudes/behaviours related to general attitudes and behaviours towards entrepreneurship in a country or group of countries.
- Activities that contemplate the creation of new initiatives and not the reducing vision of creating new companies.
- Entrepreneurial aspirations related to business innovation, growth and prosperity.

These three components can influence the economic result of entrepreneurial activities and introduce important changes in the concept of entrepreneurship. As such, and according to Ács and Szerb (2010), entrepreneurship came to be defined as a dynamic, multifaceted interaction of attitudes, activities and aspirations, allowing a new approach to the study of the impact of entrepreneurship on the economic growth of countries.

Another study (Galindo and Méndez, 2014) examined the relation between entrepreneurship, economic growth and innovation and found a positive relationship between these factors since entrepreneurship and innovative activities contribute to the increase of the economic product. This, in turn, promotes entrepreneurial initiatives and entrepreneurship. Through an empirical analysis, Bosma *et al*. (2018) concluded that the quality of the institutional environment (including indicators like the size of government, the perceived skills for creating a new business, and financial stability) stimulates entrepreneurship and, as such, economic growth. Some authors (Marfatia, 2014; Marfatia, 2015; Hüning, 2017; Hüning, 2019) conclude that the levels of risk and uncertainty about the countries' economy, that is, a country's monetary policy influences the motivation of entrepreneurs, with consequences at the product level in macroeconomic terms.

Recently, a study showed an important effect of entrepreneurial attitudes on GDP per capita. However, this effect was only confirmed for developed countries. In low- and middle-income countries, entrepreneurial activity impact was found to be negative (Doran *et al*., 2018). Bohlmann *et al*. (2017) concluded through an empirical study that entrepreneurial activity tends to be greater when the perception of opportunities by entrepreneurs is positive. According to the authors, this is due to the fact that individuals who perceive opportunities set more challenging goals and apply higher standards to assess the achievement of their goals. In this way, increasing opportunity recognition, in turn, can increase entrepreneurial behaviour and, as such, economic growth. On the other hand, the impact of entrepreneurs' perceived opportunities on entrepreneurship is not consensual since entrepreneurial capacity includes not only cognitive skills on how to start a new business, but also skills related to persistence to overcome potential obstacles, opportunities recognition and exploration, and leadership skills in contexts of uncertainty. Entrepreneurs' perceived opportunities are negatively related to age, which may be related to losing some cognitive and physical skills. However, they are positively related to the entrepreneurial activity since the perceptions of the entrepreneurs' capacities are the basis to reach the defined objective (Bohlmann *et al*., 2017; Ackerman *et al*., 2002).

Consequently, the identification of opportunities that form the basis of entrepreneurial activity is related to individuals' skills, knowledge, and experience, which in turn are more prone to take risks. According to behavioural theory, the individual's attitude towards entrepreneurship can be enhanced by combining risk taking propensity with perceived entrepreneurial opportunities. Accordingly, it is suggested that the perception of opportunities increases the intention to start a new business (Noguera *et al*., 2013; Arab & Sofiyabadi, 2013; Walker *et al*., 2013).

The analysed studies indicate that there is a general positive effect of entrepreneurial activity measured by different indicators on economic growth, but the size of this impact is not consensual depending on the measures used to capture entrepreneurial activity. Still, most studies use quantitative and more generic measures of entrepreneurial activity, especially the creation of new businesses, not incorporating the review of the concept of entrepreneurship carried out by GEM that covers entrepreneurial attitudes, behaviours, and aspirations. In this way, our study complements the existing literature on entrepreneurship and economic growth, adding a new perspective that measures entrepreneurial activity, in addition to the most generic measure of creating new businesses (TEA), through the attitudes and behaviours of entrepreneurs (perceived capacity and perceived opportunity) using a sample of European countries (from the literature review carried out there are few studies using samples with European countries), the ultimate goal being to examine the impact of several measures of entrepreneurship on the countries' economic growth.

These prior empirical results allowed to assume the following research hypotheses:

H1: Entrepreneurs' high levels of perceived opportunities (PO) have a positive relation with countries' per capita GDP.

H2: Entrepreneurs' high levels of perceived capacity (CP) have a positive relation with countries' GDP per capita.

H3: The impact of perceived opportunities (PO) on countries' economic growth is greater than the perception of capabilities (CP).

H4: The entrepreneurial activity has a positive impact on economic growth.

RESEARCH METHODOLOGY

This study used a quantitative methodology that has the advantages of validating theories and relationships between variables, generalizing results, and replicating with different samples. The analysis considered a sample of 21 countries from the European continent (United Kingdom, Switzerland, Sweden, Spain, Slovenia, Russia, Portugal, Poland, Norway, Netherlands, Latvia, Italy, Ireland, Greece, Germany, Hungary, France, Finland, Denmark, Croatia, and Belgium). These criteria for choosing these countries were data availability in GEM, which is one of the most important databases for collecting entrepreneurship data.

The analysis considered indicators for macroeconomic conditions, entrepreneurial activity, and economic growth for each country. Gross Domestic Product per capita (GDP per capita) was the dependent variable and was collected from the World Bank's World Development Indicators (WDI) as a measure of the countries' economic growth, as suggested by Schwab and Sala-i Martin (2017) and Stoica *et al*. (2020). The independent variables were divided into two groups:

1. Indicators of entrepreneurial activity, measured by three variables – total early-stage entrepreneurial activity (TEA), perceived opportunities (PO) and perceived capabilities (PC) collected from GEM.
2. Macroeconomic condition indicators as control variables. These variables are included different factors suggested, in theoretical terms, by the literature and that affect the economic growth of the countries, such as the investment measured by the gross capital formation (GROSSCAP), the knowledge measured by the expenses in research and development (R&D) and the level of education (EDUC), the unemployment rate (UNEMPLOY), public spending (GOVEXP), population growth (POP), economic openness (EOPEN) and inflation (INFLATION). These variables were collected at World Bank's WDI.

Table 1 presents the definition and source of collection of the dependent, independent and control variables used in the study.

Table 1. Description of variables

Variable name and abbreviation	Brief definition	Source
Economic Growth – Dependent variable		
GDP per capita (current US$) (GDP_PC)	GDP per capita refers to the division of gross domestic product by midyear population.	World Bank's WDI
Measures of entrepreneurial activity – Independent variables		
Perceived opportunities (PO)	Percentage of population between 18-64 years old who identify good opportunities to start a firm in the area where they live.	GEM
Perceived capabilities (PC)	Percentage of population between 18-64 years old who think they have the necessary skills and knowledge to start a business.	GEM
Total early-stage entrepreneurial activity (TEA)	Percentage of population between 18-64 years old who are either an owner-manager of a new business or a nascent entrepreneur.	GEM
Measures of economic condition – Control variables		
Gross capital formation (% of GDP) (GROSSCAP)	Gross capital formation (formerly gross domestic investment) is defined by the outlays on additions to net changes in the level of inventories plus the fixed assets of the economy.	World Bank's WDI
Research and development expenditure (% of GDP) (R&D)	Research and experimental development (R&D) includes creative work developed on a systematic basis allowing to increase the stock of knowledge and its use to devise new applications.	World Bank's WDI
Unemployment (annual, %) (UNEMPLOY)	The share of the labour force without work but available for and seeking employment.	World Bank's WDI
Government expenditures (% of GDP) (GOVEXP)	Refers to the consumption expenditure of general governments, including current government expenditures for purchases of services and goods.	World Bank's WDI
Population growth (annual, %) (POP)	Annual population growth rate, expressed as a percentage, for year t and is calculated on the exponential rate of growth of midyear population from year t-1 to t.	World Bank's WDI
Economic Openness (% of GDP) (EOPEN)	The sum of imports and exports of services and goods measured as a share of gross domestic product.	World Bank's WDI
Inflation (annual, %) ((INF)	Measures the change in the cost of acquiring a set of services and goods, measured yearly and presented as a percentage.	World Bank's WDI
Education (annual, %) (EDUC)	The percentage of people between 25-64 years old with at least the upper secondary education level.	World Bank's WDI

Note: GEM: https://www.gemconsortium.org/data; World Bank: https://databank.worldbank.org/source/ world-development-indicators.
Source: own study.

The formulated hypotheses were tested in the Eviews10 software, and three multiple linear regression models were estimated, with differences in cross-sections, using the Arellano-Bond estimator of panel generalized methods of moments (GMM)| dynamic panel data. In this type of data sample (panel data with cross-sectional and temporal data; N = 21 and T = 19), the GMM method is more efficient than the ordinary least squares or two-stage least squares methods, allowing correct heteroscedasticity problems or auto-correlation (Greene, 2020), which are common in samples with data on panel.

The GMM model is specified by a linear model $y = x\beta + u$, which fulfils the orthogonality condition $E[x'u]= 0$. The vector of estimators of β can be considered the solution that solves the equation of moments: $E[x'(y-x\beta)]= 0$. having as a solution $\beta = E(x' x)-1\ E(x' y)$, which sample correspondent is the OLS estimator − $b = (x' x)-1\ x' y$.

If any regressor is correlated with the $E[x'u] \neq 0$ disturbance, the previous estimator will be inconsistent. An alternative is to re-specify the equation by introducing variables not correlated with this disturbance: $E[z'u]= E[z'(y - x\beta)]= 0$. Instrumental variables allow solving the equation of moments (β

= E(z'x)−1 E(z'y)), and its sample equivalent is the instrumental variable estimator (bVI =(z'x)−1z'y). The instrumental variables used were the independent variables and the control variables.

Finally, with fixed effects, the time-varying errors have zero means, constant variances and zero correlations, all conditional on the observed history of the covariates and the unobserved effect (Wooldridge, 2001).

The collected sample was subjected to a descriptive statistical analysis, a panel data stationarity analysis and, finally, we estimated the three regression models in which in each model we used a different measure of different entrepreneurial activity (Tables 2 to 4).

RESULTS AND DISCUSSION

The descriptive statistics for all the variables (dependent, independent, and control) are presented in Table 2. The number of observations was 196, and the time period was 2001-2019. In terms of GDP per capita, this variable was logarithmic (first differences), and the average value of the GDP per capita logarithm was US $ 10.41. The maximum value of $ 11.54, recorded by Norway in 2014 and the minimum value was $ 8.51 recorded by Russia in 2002.

Regarding the independent variables related to the different measures of entrepreneurial activity, TEA had an average rate of 6.57%, a maximum rate of 14.19% for Latvia in 2016 and a minimum rate of 1.63% for France in 2003. The perceived opportunities (PO) variable had an average rate of 36.75%, with a maximum rate of 87.28% in Poland in 2019 and a minimum rate of 2.85% in Hungary in 2009. Finally, the variable perceived capabilities (PC) had an average rate of 42.39%, the maximum sample rate being 61.43% for Latvia in 2016 and a minimum rate of 14.58% recorded by Hungary in 2005. Thus, statistics suggest that independent variables have different impacts on countries' economic growth, and it was confirmed that there are no lagged effects.

Table 2. Descriptive statistics

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Obs.
Log (GDP_PC)	10.41	10.61	11.54	8.51	0.6093	196
PO	36.75	35.8	87.28	2.85	16.6204	196
PC	42.39	42.19	61.43	14.58	7.7876	196
TEA	6.57	6.35	14.19	1.63	2.1979	196
GROSSCAP	22.34	22.23	41.45	11.6	4.143	196
R&D	1.84	1.68	3.75	0.36	0.8791	196
UNEMPLOY	7.99	7.52	27.47	2.49	4.0342	196
GOVEXP	20.53	19.98	27.94	11.9	2.9243	196
POP	0.39	0.44	2.89	-2.08	0.6734	196
EOPEN	50.01	44.79	110.03	18.54	20.6647	196
INF	2.46	2.03	15.53	-1.08	2.3274	196
EDUC	66.98	72.85	88.71	16.19	18.3361	196

Source: own study.

Control variables represent the macroeconomic condition of countries. Gross capital formation (GROSSCAP) had an average rate of 22.34%, with the maximum value of 41.45% recorded in Latvia in 2017; research and development expenditure (I_D) had an average rate of 1.88% and a maximum rate of 3.75% in Finland in 2009; the average unemployment rate (UNEMPLOY) was 7.99%, and the maximum rate was 27.47% in Greece in 2013; government expenditures (GOVEXP) had an average rate of 20.53% and a maximum rate of 27.94% in Denmark in 2009; the average population growth rate (POP) was 0.39%, with the maximum value of the sample being 2.89%, recorded in Ireland in 2007; economic openness (EOPEN) had an average rate of 50.01% and a maximum rate of 110.02% registered in Ireland in 2014; inflation (INF) had an average rate of 2.46% and a maximum rate of 15.53% recorded in Latvia in 2008, finally, education (EDUC) had an average rate of 66.98% and a maximum rate 88.71% recorded in Switzerland in 2009.

In Table 3, we performed a panel data stationarity analysis, and we could conclude that our data is stationary, for a mean stationarity significant at 1%, 5%, and 10%.

Table 3. Panel unit root tests

Variables	Levin-Lin-Chu (2002) – adjusted t*	Breitung (2000) – ambda (statistics)	Im–Pasaran–Shin (1997) – t-tilde-bar (statistics)
PO	-1.8611**	-1.7511**	-1.456**
PC	-1.9762**	-1.6354**	-1.6034**
TEA	-2.0054***	-1.4554*	-1.5509*
LN (GDP_PC)	-17.3456**	-1.8345***	-1.9306***
GROSSCAP	38.7563 ***	- 1.8385 **	- 1.8932 **
R&D	17.6987**	3.7537*	-1.4909*
UNEMPLOY	-22.3504***	-1.0564*	-1.5734*
GOVEXP	-33.9870**	-3.6789**	-1.5543**
POP	-6.9812**	-1.4379**	-1.7432**
EOPEN	- 12.4569**	-3.1297*	- 1.4409*
INFLATION	-8.9723**	-0.8196**	-1.7489*
EDUC	-1.1223**	-2.4560**	-2.4560**

Notes: (i) ***, **, * mean stationarity significant at 1%, 5% and 10%; (ii) In all tests, the null hypothesis (H0) is all data panels contain a unit root. (iii) In the case of the Levin-Lin-Chu (2002) test and Breitung (2000) test, we used a time trend for all variables; In the case of the Im-Pasaran-Shin (1997) test, we used the time trend for all variables, and the time trend and sub-tracted cross-sectional means for PO, PC, and TEA.
Source: own study.

As previously described, three different multiple linear regression models were estimated using the GMM method (Table 4). Because we used the Arellano-Bond estimator, in the three models estimated by GMM, the GDP_PC was introduced with a one-year delay (GDP_PC(-1)) as a dependent variable. On the other hand, to solve the problems of endogeneity, the variables of entrepreneurial activity and control (macroeconomic conditions) were used with a one-year delay as instruments.

Thus, each model represents the impact of each of the three different entrepreneurship measures on countries' economic growth: perceived opportunities (PO), perceived capabilities (PC), and total early-stage entrepreneurial activity (TEA). In Table 4, the p-values AR(1) were less than 0.10, which means we rejected the null hypothesis that there was no autocorrelation of the error terms for a significance level of 0.10. The AR(2) test was more important, because it allows detecting levels of autocorrelation (Mileva, 2007) and validating the quality of the GMM estimator. As a result of applying the AR(2) test to our three models, we concluded that there was no second-order autocorrelation because the p-value AR(2) was greater than 0.10. as defined by Lahouel *et al*. (2019). The Hasen test was also used to assess the quality of the instrumental variables (Hayashi, 2000). The finding that the p-values of the Hansen test were greater than 0.10, which means that the models were well specified and there was no evidence to reject the validity of the instrumental variables used in the regressions.

In each of the models, control variables referring to the macroeconomic condition were included, which were very significant to explain GDP per capita (verified by p-value, mostly p-value <0.01), with the exception of the Inflation variable (INF), which was not significant in all estimated models. The control variables presented a positive relation to GDP (per capita), with the exception of the unemployment rate (UNEMPLOY) and the public spending rate (GOVEXP), which had a negative impact on GDP per capita.

Perceived opportunities (PO) had a positive relation ($\beta = 0.0057$) with economic growth, *i.e.*, 0.57% of changes in GDP per capita were explained by this variable, confirming H1. Although significant but positively related to economic growth, this measure of entrepreneurial activity had a very small impact (0.57%), as obtained by Urbano and Aparicio (2016), Bohlmann *et al*. (2017) and Stoica *et al*. (2020). This means that higher GDP per capita was related to higher levels of perceived opportunities, which

means that the perceived opportunities encourage entrepreneurship as it contributed to reducing unemployment in countries and, as such, promoting their economic growth.

Table 4. Regression analysis

LOG(GDP_PC)	Model 1	Model 2	Model 3
LOG(GDP_PC)(-1)	0.7491*** (0.0462)	0.7796*** (0.0894)	0.7414*** (0.0518)
Entrepreneurial activity			
PO	0.0057* (0.0014)		
PC		-0.0042*** (0.0025)	
TEA			-0.0067** (0.0055)
Control variables – Macroeconomic conditions			
GROSSCAP	0.0205*** (0.0012)	0.0212*** (0.0073)	0.0139*** (0.0050)
R&D	0.0858*** (0.0849)	0.0410** (0.0592)	0.0842*** (0.0753)
UNEMPLOY	-0.0105*** (0.0107)	-0.0139*** (0.0188)	-0.0132*** (0.0120)
GOVEXP	-0.0002*** (0.0134)	-0.0011*** (0.0135)	-0.00023*** (0.0149)
POP	0.0148*** (0.0766)	0.0746*** (0.0842)	0.0058*** (0.0781)
EOPEN	0.0067*** (0.0046)	0.0050*** (0.0027)	0.0069*** (0.0037)
INFLATION	0.0049 (0.0072)	0.0122 (0.0092)	0.0032 (0.0084)
EDUC	0.0035** (0.0034)	0.0009*** (0.0028)	0.0023** (0.0027)
AR(1) p-value (AR1)	-0.0755 0.0000	-0.0632 0.0000	-0.0350 0.0000
AR(2) p-value (AR2)	0.1044 0.6522	0.1057 0.6989	0.1002 0.7324
p-value (Hansen test)	0.8567	0.7895	0.7456
Obs.	165	165	165
Cross-sections	20	20	20
Period Included	17	17	17

Note: *** p < 0.01; ** p < 0.05; *p < 0.10; standard errors are shown in parentheses. All models are estimate by GMM method using the Arellano-Bond estimator. All models include time and fixed effects.
Source: own study.

According to the results of Model 2, perceived capacities (PC) had a negative relation (β = -0.0042) with GDP (per capita). This means that higher GDP per capita was not related to higher levels of perceived capacities. This result, according to the studies by Bohlmann *et al. (*2017) and Ackerman *et al. (*2002), may result from the fact that the population included in the sample is older, that is, older adults have age-related cognitive and physical declines and, as such, less perceived capacities. This may function as an inhibitor of entrepreneurial activity and, as a consequence, reduce the impact on economic growth. In this way, H2 is rejected. However, perceived capacities are strongly indirectly related to entrepreneurial intention through perceived opportunities (Tsai *et al.,* 2016) and, according to the results of Models 1 and 2, we verify that entrepreneurial activity measured by perceived opportunities does have a positive impact on economic growth.

The impact of perceived opportunities on countries' economic growth was greater (β = 0.0057) than the perception of capacities (β = -0.0042), confirming hypothesis H3.

According to Model 3, total early-stage entrepreneurial activity (TEA) had a negative relation (β = -0.0067) to the economic growth of the selected countries, rejecting H4. This result could be explained by the fact that countries are not divided by their level of economic development and corroborate the conclusions of several authors that TEA may have different economic results (Bosma *et al.,* 2009 and 2012; Gries & Naudé, 2010; Valliere & Peterson, 2009; Ferreira *et al.,* 2017; Almodóvar-González *et al.,* 2020).

Thus, the impact of entrepreneurial activity on the economic growth of the European countries considered in the sample depends on the measure of entrepreneurial activity, that is, the use of perceived opportunities (PO), perceived capacities (PC), and the total early-stage entrepreneurial activity (TEA) may condition the impact of entrepreneurship on countries' economic growth.

CONCLUSIONS

Starting from the relationship between economic growth and entrepreneurship already studied in empirical terms by various authors, we tested three models with different measures of entrepreneurial activity. For the group of 21 European countries in the sample, we conclude that the impact of entrepreneurial activity on the economic growth of countries, measured by their GDP per capita, depends on the measure of entrepreneurial activity.

For this group of countries, entrepreneurial activity measured by the ability to perceive that there is a good opportunity (PO) to start a new business in the area of residence has a positive relation with the economic growth (confirming H1), *i.e.*, higher GDP per capita is related to higher levels of perceived opportunities. Furthermore, perceived opportunities have an indirect impact on countries' economic growth through perceived capacities, leading to reduced unemployment and, as such, promoting economic growth. However, perceived capacities (PC) have a negative relation to economic growth (rejecting H2), *i.e*., higher GDP per capita is not related to higher levels of perceived capacities. The explanation may be related to the age of entrepreneurs, which has a negative effect on this variable. However, the impact of perceived opportunities (OP) on countries' economic growth is greater than the perception of capabilities (CP), confirming H3. Entrepreneurship measured through TEA in the group of countries considered has a negative impact on economic growth (rejecting the H4), which can be explained by the fact that differences in the level of development of countries have not been considered (classification of countries into countries developed and developing according to the value of GDP per capita).

Thus, in general, the practical implications of this study are the entrepreneurship motivated by opportunity, and also directly or indirectly through perceived capacities. It is an important factor to stimulate the economic growth of the European countries analysed.

In terms of limitations, this research uses a somewhat small sample (21 European countries and a maximum time period of 2001-2019) as a result of the availability of data. In future studies, we will try to use a larger sample of countries, divide countries by their stage of development (developed and developing countries) and include new variables that capture the attitudes and behaviours of entrepreneurs, such as, for example, the entrepreneurial intention, the motivation index of entrepreneurs, and entrepreneurship as a career choice.

REFERENCES

Ackerman, P. L., Beier, M. E., & Bowen, K. R. (2002). What we really know about our abilities and our knowledge. *Personality and Individual Differences, 33*(4), 587-605. https://doi.org/10.1016/S0191-8869(01)00174-X

Ács, Z. J., & Naudé, W. (2011). *Entrepreneurship, stages of development, and industrialization* (WIDER Working Paper 2011/080). Helsinki: World Institute for Development Economic Research.

Ács, Z. J., & Szerb, L. (2010). *Global entrepreneurship and the United States*. DTIC Document. Retrieved from: https://thegedi.org/wp-content/uploads/2011/04/SBA_Gedi1.pdf on April 9, 2021.

Ács, Z. J., & Varga, A. (2005). Entrepreneurship, agglomeration and technological change. *Small Business Economics*, *24*, 323-334. https://doi.org/10.1007/s11187-005-1998-4

Alheet, A. F. (2019). Investigating the relationship between entrepreneurial activity and economic growth: a case of Middle East. *Entrepreneurship and Sustainability Issues*, *7*(2): 1036-1047. https://doi.org/10.9770/jesi.2019.7.2(17)

Almodóvar-González, M., Fernández-Portillo, A. & Díaz-Casero, J. (2020). Entrepreneurial activity and economic growth – a multi-country analysis. *European Research on Management and Business Economics, 26*(1), 9-17. https://doi.org/10.1016/j.iedeen.2019.12.004

Amorós, J. E., Fernández, C., & Tapia, J. (2012). Quantifying the relationship between entrepreneurship and competitiveness development stages in Latin America. *International Entrepreneurship and Management Journal*, *8*, 249-270. https://doi.org/10.1007/s11365-010-0165-9

Arab, Z., & Sofiyabadi, J. (2013). Entrepreneurship indicators with an emphasis on Global Entrepreneurship Monitor. *IJRRAS, 16*(2), 288-296.

Audretsch, D. B. (2007). Entrepreneurship capital and economic growth. *Oxford Review of Economic Policy*, *23*, 63-78. https://doi.org/10.1093/oxrep/grm001

Audretsch, D. B., & Keilbach, M. (2008). Resolving the knowledge paradox: Knowledge-spillover entrepreneurship and economic growth. *Research Policy*, *37*(10), 1697-1705. https://doi.org/10.1016/j.respol.2008.08.008

Audretsch, D., & Keilbach, M. (2004). Entrepreneurship capital and economic performance. *Regional Studies*, *38*, 949-959. https://doi.org/10.1080/0034340042000280956

Avnimelech, G., Zelekha, Y., & Sharabi, E. (2014). The effect of corruption on entrepreneurship in developed vs non- developed countries. *International Journal of Entrepreneurial Behavior & Research, 20*, 237-262. https://doi.org/10.1108/IJEBR-10-2012-0121

Baliamoune-Lutz, M. (2015). Taxes and entrepreneurship in OECD countries. *Contemporary Economic Policy*, *33*, 369-380. https://doi.org/10.1111/coep.12079

Baptista, R., Escária, V. & Madruga, P. (2005). *Entrepreneurship, Regional Development and Job Creation: the Case of Portugal* (Discussion Paper # 0605). Munich: Max Planck Institute.

Baumol, W. J., & Strom, R. J. (2007). Entrepreneurship and economic growth. *Strategic Entrepreneurship Jou*rnal, *1,* 233-237. https://doi.org/10.1002/(ISSN)1932-443X

Bohlmann, C., Rauch, A., & Zacher, H. (2017). A lifespan perspective on entrepreneurship: Perceived opportunities and skills explain the negative association between age and entrepreneurial activity. *Frontiers in Psychology*, *8*(DEC), 1-11. https://doi.org/10.3389/fpsyg.2017.02015

Bosma, N. (2013). The Global Entrepreneurship Monitor (GEM) and its impact on entrepreneurship research. *Foundations and Trends in Entrepreneurship, 9*(2), 143-248. https://doi.org/10.1561/0300000033

Bosma, N., Ács, Z., Autio, E., Coduras, A., & Levie, J. (2009). *GEM executive report 2008. Babson Park,* MA: Babson College.

Bosma, N., Content, J., Sanders, M., & Stam, E. (2018). Institutions, entrepreneurship, and economic growth in Europe. *Small Business Economics*, *51*(2), 483-499. https://doi.org/10.1007/s11187-018-0012-x

Bosma, N., Stam, E., & Wennekers, S. (2012). Entrepreneurial employee activity: a large scale international study. *Tjalling C. Koopmans Research Institute, 12*(August 2012), 1-13.

Bosma, N., Stam, F. & Schutjens, V. (2006). *Creative Destruction and Regional Competitiveness. Scales Research Reports H200624.* Brussels: EIM Business and Policy Research.

Carlsson, B., Acs, Z. J., Audretsch, D. B., & Braunerhjelm, P. (2009). Knowledge creation, entrepreneurship, and economic growth: A historical review. *Industrial and Corporate Change*, *18*, 1193-1229. https://doi.org/10.1093/icc/dtp043

Carree, M. A., & Thurik, A. R. (2008). The lag structure of the impact of business ownership on economic performance in OECD countries. *Small Business Economics, 30*(1), 101-110. https://doi.org/10.1007/s11187-006-9007-0

Carree, M., Van Stel, A. Thurik, R. & Wennekers, S. (2007). The Relationship between Economic Development and Business Ownership Revisited. *Entrepreneurship and Regional Development, 19*(3), 281-291. https://doi.org/10.1080/08985620701296318

Carreee, M. & Thurik, A. R. (2008). The lag Structure of the Impact of Business Ownership on Economic Performance in OECD Countries. *Small Business Economics, 30*, 101-110. https://doi.org/10.1007/s11187-006-9007-0

Coulibaly, D., & Goueu, F. Z. (2019). An Empirical Analysis of the Link between Economic Growth and Exports in Côte d'Ivoire. *International Business Research, 12*(9), 94. https://doi.org/10.5539/ibr.v12n9p94

Deller, S.C. (2007). Microenterprises and Economic Growth: A Panel Study of the US States 1977 to 1997. *Applied Economics Letters*, *16*, 1307-1312. https://doi.org/10.1080/13504850701367361

Doran, J., McCarthy, N. & O'Connor, M. (2018). The role of entrepreneurship in stimulating economic growth in developed and developing countries. *Cogent Economics & Finance, 6*(1), 1442093. https://doi.org/10.1080/23322039.2018.1442093

Ferreira, J. J., Fayolle, A., Fernandes, C., & Raposo, M. (2017). Effects of Schumpeterian and Kirznerian entrepreneurship on economic growth: Panel data evidence. *Entrepreneurship & Regional Development, 29*(1-2), 27-50. https://doi.org/10.1080/08985626.2016.1255431

Fritsch, M. (2004). *Entrepreneurship, Entry and Performance of New Business Compared in two Growth Regimes: East and West Germany* (Discussion Paper # 4104). Munich: Max Planck Institute. https://doi.org/10.1007/s00191-004-0230-z

Fritsch, M. (2008). How does new business formation affect regional development? Introduction to the special issue. *Small Business Economics, 30*(1), 1-14. https://doi.org/10.1007/s11187-007-9057-y

Fritsch, M. & Muller, P. (2004). *Regional Growth Regimes Revisited – The Case of West Germany* (Freiberg Working Papers No 2004/6). Freiberg: TU Bergakademie Freiberg, Faculty of Economics and Business Administration.

Galindo, M. Á., & Méndez, M. T. (2014). Entrepreneurship, economic growth, and innovation: Are feedback effects at work?. *Journal of Business Research*, *67*(5), 825-829. https://doi.org/10.1016/j.jbusres.2013.11.052

Global Entrepreneurship Monitor (2020). GEM Key Indicators. Retrieved from: https://www.gemconsortium.org/data on October 14, 2020

World Bank. World Development Indicators (2020). Retrieved from: https://databank.worldbank.org/source/world-development-indicators on October 14, 2020

Greene, W. (2020). *Econometric Analysis*. 8th edition. London: Pearson Education Limited.

Gries, T., & Naudé, W. (2010). Entrepreneurship and structural economic transformation. *Small Business Economics, 34*(1), 13-29. https://doi.org/10.1007/s11187-009-9192-8

Hartog, C., Parker, S., van Stel, A. & Thurik, R. (2010). *The Two-Way Relationship Between Entrepreneurship and Economic Performance. Scientific Analysis of Entrepreneurship and SMEs* (Scales Research Reports H200822): Brussels: EIM Business and Policy Research.

Hashi, I., & Krasniqi, B. A. (2011). Entrepreneurship and SME growth: Evidence from advanced and laggard transition economies. *International Journal of Entrepreneurial Behavior & Research*, *17*(5), 456-487. https://doi.org/10.1108/13552551111158817

Hayashi, F. (2000). Econometrics. Princeton: Princeton University Press

Hessels, J., & van Stel, A. (2011). Entrepreneurship, export orientation, and economic growth. *Small Business Economics*, 37(2), 255-268. https://doi.org/10.1007/s11187-009-9233-3

Hüning, H. (2017). Asset market response to monetary policy news from SNB press releases. *North American Journal of Economics and Finance, 40*(C), 160-177. https://doi.org/10.1016/j.najef.2017.02.003

Hüning, H. (2019). Swiss National Bank communication and investors uncertainty. *North American Journal of Economics and Finance*, 51(C), 101024. https://doi.org/10.1016/j.najef.2019.101024

Hurtado Rendón, A., Velásquez, H., & Támara, A. (2017). La creación de empresas bajo un enfoque estructural: Un caso de aplicación. *Espacios, 38*(24), 289-300. https://doi.org/10.1007/s11187-010-9307-2

Kirzner, I.M. (1973). *Competition and Entrepreneurship.* Chichago, IL: University of Chicago Press

Knight, F.H. (1921). *Risk, uncertainty and profit.* New York: Houghton Mifflin

Lahouel, B.B., Gaies, B., Zaied, Y.B., & Jahmane, A. (2019). Accounting for endogeneity and the dynamics of corporate social – corporate financial performance relationship. *Journal Cleaner Production, 230*(1), 352-364. https://doi.org/10.1016/j.jclepro.2019.04.377

Li, H., Yang, Z., Yao, X. & Zhang, J. (2012). Entrepreneurship and Growth: Evidence from China. *China Economic Review, 23*(4), 948-961. https://doi.org/10.1016/j.chieco.2012.04.015

Marcotte, C. (2014). Entrepreneurship and innovation in emerging economies: Conceptual, methodological and contextual issues. *International Journal of Entrepreneurial Behavior & Research*, *20*(1), 42-65. https://doi.org/10.1108/IJEBR-09-2012-0089

Marfatia, H. A. (2014). Impact of uncertainty on high frequency response of the U.S. stock markets to the Fed's policy surprises. *Quarterly Review of Economics and Finance*, *54*(3), 382-392. https://doi.org/10.1016/j.qref.2013.12.003

Marfatia, H. A. (2015). North American Journal of Economics and Finance Monetary policy 's time-varying impact on the US bond markets: Role of financial stress and risks. *North American Journal of Economics and Finance*, *34*, 103-123. https://doi.org/10.1016/j.najef.2015.08.006

Mariet Ocasio, V., & Mariet Ocasio, V. (2016). Financing village enterprises in rural Bangladesh: What determines non- farm revenue growth?. *International Journal of Development Issues*, *15*(1), 76-94. https://doi.org/10.1108/IJDI-09-2015-0057

Martin M., Picazo, M. & Navarro, J. (2010). Entrepreneurship, Income Distribution and Economic Growth. *International Entrepreneurship Management Journal, 6*, 131-141. https://doi.org/10.1007/s11365-010-0142-3

Mileva, E. (2007), Using Arellano-Bond dynamic panel in Stata. Economics Department, Fordham University. Retrieved from: https://www.studocu.com/row/document/university-of-mauritius/law-and-management/elitz-using-arellano-bond-gmmestimators/1633335 on April 9, 2021

Minniti, M., & Lévesque, M. (2010). Entrepreneurial types and economic growth. *Journal of Business Venturing*, *25*(3), 305-314. https://doi.org/10.1016/j.jbusvent.2008.10.002

Mojica, M., Gebremedhin, T. & Schaeffer, P. (2009). *An Empirical Analysis of Link Between Entrepreneurship and Economic Growth in West Virginia* (*Research Paper* 2009-2). Atlanta: Southern Agricultural Economics Association. https://doi.org/10.22004/ag.econ.46723

Naudé W. (2008). *Entrepreneurship in Economic Development* (*UNU – WIDER,* Research Paper, no 2008/20). Helsinki: World Institute for Development Economic Research. https://doi.org/10.1093/acprof:oso/9780199671656.003.0019

Noguera, M., Alvarez, C., & Urbano, D. (2013). Socio-cultural factors and female entrepreneurship. *International Entrepreneurship and Management Journal, 9*(2), 183-197. https://doi.org/10.1007/s11365-013-0251-x

Olaison, L., & Meier Sørensen, B. (2014). The abject of entrepreneurship: Failure, fiasco, fraud. *International Journal of Entrepreneurial Behavior & Research, 20*(2), 193-211. https://doi.org/10.1108/IJEBR-09-2013-0143

Pittaway, L. (2005). Philosophies in entrepreneurship: A focus on economic theories. *International Journal of Entrepreneurial Behavior & Research, 11*(3), 201-221. https://doi.org/10.1108/13552550510598790

Schumpeter, J. (1911). Theory of economic development: An inquiry into profits, capital, credit, interest and the business cycle. Cambridge, MA: Harvard University Press

Schwab, K. & Sala-i-Martin, X. (2018). *The global competitiveness Report 2017-2018*. Geneva: World Economic Forum

Stam E., Kashifa, S., Hessels, S. & van Stel, A. (2007). *High Growth Entrepreneurs, Public Policies and Economic Growth* (*Scales Research Reports* H200608). Brussels: EIM Business and Policy Research.

Stam, E., & Van Stel, A. (2011). Types of entrepreneurship and economic growth. In A. Szirmai & M. Wim Naudé (eds.), *Entrepreneurship, innovation, and economic development* (pp. 78-95). Oxford: Oxford University Press

Stam, E., Hartog, C., Van Stel, A., & Thurik, R. (2011). Ambitious entrepreneurship, high-growth firms and macroeconomic growth. In M. Minniti (ed.), *The dynamics of entrepreneurship: Evidence from global entrepreneurship monitor data* (pp. *2*31-249). Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199580866.001.0001

Stoica, O., & Roman, A. (2020). The Nexus between Entrepreneurship and Economic Growth: A Comparative Analysis on Groups of Countries. *Sustainability, 12*(3), 1186. https://doi.org/10.3390/su12031186

Tsai, K., Chang, H. & Peng, C. (2016). Refining the linkage between perceived capability and entrepreneurial intention: roles of perceived opportunity, fear of failure, and gender. *International Entrepreneurship and Management Journal, 12,* 1127-1145. https://doi.org/10.1007/s11365-016-0383-x

Thurik R. (2009). *Entrepreneurship, Economic Growth and Policy in Emerging Economies* (*UNU- WIDER*, Research Paper no 2009/12). Helsinki: World Institute for Development Economic Research

Urbano, D., & Aparicio, S. (2016). Entrepreneurship capital types and economic growth: International evidence. *Technological Forecasting and Social Change, 102*(C), 34-44. https://doi.org/10.1016/j.techfore.2015.02.018

Valliere, D., & Peterson, R. (2009). Entrepreneurship and economic growth: Evidence from emerging and developed countries. *Entrepreneurship and Regional Development*, *21*(5-6), 459-480. https://doi.org/10.1080/08985620802332723

Van Praag, C. M., & Versloot, P. H. (2007). What is the value of entrepreneurship?. A review of recent research. *Small Business Economics*, *29*(4), 351-382. https://doi.org/10.1007/s11187-007-9074-x

Walker, J. K., Jeger, M., & Kopecki, D. (2013). The role of perceived abilities, subjective norm, and intentions. *Journal of Entrepreneurship*, *22*(2), 181-202. https://doi.org/10.1177/0971355713490621

Wennekers, S., Van Stel, A., Carree, M., & Thurik, R. (2010). The relationship between entrepreneurship and economic development: Is it U-Shaped?. *Foundations and Trends in Entrepreneurship*, *6*(3), 167-237. https://doi.org/10.1561/0300000023

Wooldridge, J. (2001). Applications of Generalized Method of Moments Estimation. *Journal of Economic Perspectives*, *15*(4), 87-100.

Wong, P. K., Ho, Y. P., & Autio, E. (2005). Entrepreneurship, innovation and economic growth: Evidence from GEM data. *Small Business Economics*, *24*(3), 335-350. https://doi.org/10.1007/s11187-005-2000-1

World Bank. World Development Indicators (2020). Retrieved from: https://databank.worldbank.org/source/world-development-indicators October 14, 2020

Authors

The contribution share of authors is equal and amounted to 50% for each of them.

Sofia Gomes

Assistant Professor at the Department of Economics and Management of University Portucalense. She is a researcher at REMIT – Research on Economics, Management and Information Technologies. PhD in Applied Economics. Her research interests include entrepreneurship, digital economy, corporate finance.

Correspondence to: Dr. Sofia Gomes, University Portucalense, Rua Dr. António Bernardino de Almeida, n.º 541/619, 4200-072 Porto, Portugal, email: sofiag@upt.pt

ORCID http://orcid.org/0000-0002-0326-0655

Pedro Ferreira

Assistant Professor at the Department of Economics and Management of University Portucalense, and an Invited Professor at Porto Polytechnic Institute. He is a researcher at REMIT – Research on Economics, Management and Information Technologies and at CEOS.PP. PhD in Applied Economics. His research interests include entrepreneurship, HRM and organizational behaviour, marketing and consumer behaviour.

Correspondence to: Dr. Pedro Ferreira, University Portucalense, Rua Dr. António Bernardino de Almeida, n.º 541/619, 4200-072 Porto, Portugal, email: pferreira@upt.pt

ORCID http://orcid.org/0000-0002-6506-7869

Acknowledgements and Financial Disclosure

We would like to thank the anonymous referees for their useful comments, which allowed to increase the value of this article.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright and License