BOOK OF ABSTRACTS

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WELCOME MESSAGE

Regional Entrepreneurial Ecosystems and Sustainability – Rethinking the Helix

In an increasingly global and feverish economy, regional cartography is not always sufficiently documented and discussed. At the same time, the narrative "trial-mistake" is often discouraged, considering that when success emerges one should hide hypothetical errors. In a scenario, in which the new industry paradigms and value-adding processes require a critical reflection on the sustainability of entrepreneurial ecosystems and on the relations between firms, governments, society and the processes of knowledge creation emerges the 4th International congress of Regional Helix, under the topic *"Regional Entrepreneurial Ecosystems and Sustainability - Rethinking the Helix"*.

Since its creation, the Regional Helix conference emphasizes the importance of cooperation and this edition is no exception and it results from a joint organization between the School of Technology and Management of the Polytechnic of Porto, through its research center (CIICESI), of the Polytechnic Institute of Castelo Branco, NECE (research center of the Department of Economics and Management of the University of Beira Interior) and University of Trás os Montes and Alto Douro.

The participation of several researchers from national and international institutions is an important step in the achievement of these aims. We are pleased to welcome colleagues from countries across the globe. We believe that this multiplicity reflects the interest that regional entrepreneurial ecosystems and sustainability issues have transversely across the world.

Finally, we would like to call your attention to the several publication opportunities that Regional Helix 2019 bring to you, and we invite all colleagues to submit their papers for the publications that better fit their research.

Welcome to the fourth edition of Regional Helix!

Vítor Braga & Marisa Roriz Ferreira
Chair and Co-Chair of the Organizing Committee

PARALLEL SESSIONS 15

GLOBAL COMPETITIVENESS INDEX VS. GLOBAL ENTREPRENEURSHIP INDEX: A COMPARATIVE ANALYSIS AT THE INTERNATIONAL SCALE

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Extended Abstract

Abstract

The global competitiveness of countries is recognised as being impacted by several social, economic and cultural factors. Entrepreneurship is recognised for generating economic growth through the introduction of innovations in the market. In this perspective, this paper aims to analyse the relationship between entrepreneurship and competitiveness using cluster analysis and Pearson's correlation coefficient, based on the data and variables of the Global Competitiveness Index and the Global Entrepreneurship Index. The results show that the countries studied are in contexts that influence competitiveness and entrepreneurship in a similar way, and that the variables that drives the competitiveness influence entrepreneurship and vice versa.

Keywords: Global Competitiveness Index; Global Entrepreneurship Index; Clusters; Development.

1 Introduction

It is natural for countries the efforts to achieve its people's welfare and standard lifting life. To achieve these goals, several variables must be worked together, considering social, economic, and cultural, among others. The proper functioning of these various factors and a positive relationship between them provides results in the form of economic development. Overall, the most competitive countries achieve these results. In this scenario, the phenomena of entrepreneurship and innovation stand out, since the role of the entrepreneur is fundamental in the introduction of innovations in the market and consequently in the generation of economic development (Schumpeter, 1997).

The next point is about the review of the literature related to the themes of competitiveness and entrepreneurship. Next, in point 3, the study objective, research hypothesis and methodological procedures are presented. In point 4 the results are presented and discussed, and finally in point 5 the main conclusions are described.

2 Literature Review

The concept of competitiveness has several approaches in the literature, starting from the microeconomic to the macroeconomic context. Aiginger and Firgo (2015) understand that competitiveness originates at the business level, but it is also influenced by economic policy and by the conditions of the economic factors in question. Among the most recent approaches, those that take into account social, economic and cultural factors predominate, giving a more complex character to the phenomenon of competitiveness.

In the macroeconomic perspective, competitiveness involves the ability to create well-being (Aiginger, 2006) and the ability to achieve goals beyond Gross Domestic Product (GDP) for its citizens in terms of income, social and ecological aspects (Aiginger, Bärenthaler-Sieber, & Vogel, 2013). The World Economic Forum (WEF) defines competitiveness as the "set of institutions, policies, and factors that determine the level of productivity of an economy, which in turn sets the level of prosperity that the country can earn." (2015, p. 4). According to the organization, competitiveness contributes to higher living standards and generates the resources needed for broader societal goals.

For Schumpeter (1997), the essence of economic development is in the creation of new combinations that disturb the equilibrium of the market forces hitherto established. Therefore, innovation is an essential factor for the competitive context. In addition to being an opportunity for growth and survival for organizations, it offers a chance to influence the context in which it is inserted by promoting the redefinition of government practices and philanthropy (Davila, Epstein, & Shelton, 2007). Understanding the process of competitiveness means analysing in depth the quantity, quality and conditions of the process inputs, highlighting the analysis of institutions, production, dynamics and diffusion of innovation in the environmental context (Aiginger, 2006).

The entrepreneurs, through the creation of new products, new methods of production, new sources of raw materials, and new forms of organization and exploration of new markets are responsible for triggering economic development (Schumpeter, 1997). The value of entrepreneurs is notorious at the community level, where successful new businesses tend to create new jobs, increase incomes and generate wealth, and connect the community to the global economy, and at the national level, where more entrepreneurial activity have stronger GDP growth (Henderson, 2002). When talking about entrepreneurship, we talk about job creation and growth through innovation (GEDI, 2018), since it is a social process in which an individual or group of individuals, using exclusive resources and the exploitation of opportunities in a given context, creates wealth (Ireland, Hitt, Camp, & Sexton, 2001).

Economic growth, innovation and entrepreneurship are variables that exert positive effects on one another in a virtuous circular effect. The greater the activity of entrepreneurship and innovation, the greater the economic activity, just as in the same way this has positive effects on the activities of entrepreneurship and innovation. The absence of impediments to this virtuous circle would create benefits for the nation in the form of higher levels of employment, well-being, and income distribution. High levels of economic activity create new business opportunities, encouraging entrepreneurs' interest in accessing new markets and supplying products with a greater degree of competitiveness (Galindo, & Méndez, 2014). Cultural differences are important in explaining the behavioural difference of entrepreneurs and therefore economic policies must be directed to balancing these differences and preparing the actors for entrepreneurship. Institutional support for entrepreneurship policies is fundamental to cover up market inadequacies and provide financial and human resources to foster entrepreneurial activity, especially in less mature markets (Porfírio, Carrilho, & Mónico, 2016).

Acs (2006) states that the economic development of a nation originates from the combination of successful entrepreneurship and the strength of established corporations. The benefits are verified through the variation of national income, reflected in GDP per capita. In countries with low national income, entrepreneurship as self-employment offers job opportunities and conditions for creating markets. With the increase in national income, new technologies emerge and economies of scale allow larger organizations to establish themselves and increase their role in the market. At the same time, the number of new businesses is decreasing in the face of the growing number of people finding a stable job.

Finally, "as further increases in income are experienced, the role played by the entrepreneurial sector increases again, as more individuals have the resources to go into business for themselves in a business environment that allows the exploitation of opportunities" (Acs, 2006, p 104). In this way, entrepreneurship has different challenges according to the state of economic development of the country, which requires the use of different incentive policies, (Acs, 2006).

3 Research Methodologies

3.1 Study Objective and Research Hypothesis

In order to understand the relationship between entrepreneurship and competitiveness as drivers of economic development, and therefore as ways to reach higher levels of income and well-being of a nation, this paper proposes the analysis of the GCI and the GEI, observing the behaviour of the factors that impact the countries around the world in terms of entrepreneurship and competitiveness. In order to contribute to this study objective, the following research hypothesis was also proposed:

H1: There is a relationship between entrepreneurship and competitiveness at the international level.

The data used to calculate the indices "are useful in providing basic information on the economic, social, political, general business environment and market conditions in a specific country or geographical area" (Craig & Douglas, 2000, p. 39). The GCI was developed by the World Economic Forum with the aim of providing conditions to chart a path to growth, focusing on 12 important pillars for competitiveness, such as Institutions, Infrastructure, ICT Adoption, Macroeconomic Stability, Health, Skills, Product Market, Labour Market, Financial System, Market Size, Business Dynamism and Innovation Capability. 140 countries are analysed and classified according to the GCI.

The GEI was developed by the Global Entrepreneurship and Development Institute, with the purpose of capturing the multidimensional and dynamic characteristics of the context of entrepreneurship, in order to observe quantitative and qualitative differences, incorporating variables of individual and institutional level. The GCI calculation is carried out in 137 countries and is structured in 14 pillars considered important for entrepreneurship, being Opportunity Perception, Start-up Skills, Risk Acceptance, Networking, Cultural Support, Opportunity Start-up, Technology Absorption, Human Capital, Competition, Product Innovation, Process Innovation, High Growth, Internationalization and Risk Capital.

Based on the pillars that influence each of the indices, it is intended to observe relations and differences between them, in addition, it is intended to verify the existence of groups of countries with similar characteristics.

3.2 Description of Data Analysis

In order to respond to the objective of the study, in addition to the use of an exploratory analysis of descriptive statistics, the multivariate statistical technique cluster analysis was used. In this context, its purpose is to create homogeneous groups of countries with similar characteristics based on data from the GEI and the GCI.

Cluster analysis should be used when the researcher wants to verify the existence of similar behaviours between observations in relation to certain variables and at the end of the study determine groups, called clusters, with homogeneous internal characteristics (Fávero, & Belfiore, 2017).

A cluster analysis was performed for the GCI dataset using its 12 pillars as variables, and another analysis was performed for the GEI data based on its 14 pillars, also used as variables. The two databases refer to the year 2018. The clustering method defined for these clusters analysis was the Ward method which is hierarchical, because it allows the identification of the ordering and the allocation of observations, so that the researcher is able to study, evaluate and decide, based in the literature or in some rule, the number of clusters to consider in the study. Ward method is also agglomerative since larger groupings are formed at each stage of agglomeration through the addition of new observations or groups (Fávero, & Belfiore, 2017). In this method, the decision of which pair of groupings to combine is based on which combination minimizes the internal sum of squares in the complete set of separate or disjoint groupings. The quadratic Euclidean distance was used as dissimilarity distance, since it is recommended when Ward's method is used (Hair et al., 2009). To define de optimal number of clusters the criterion of the coefficient of determination (r^2) was used, which reflects the percentage measure of total variability that is retained in each of the resulting solutions.

The clusters resulting from the two clusters analyses were characterised based on the centrality indicator of the distribution – the mean – and the variability indicators of the same distribution – minimum and maximum values and standard deviation. Then the analysis of the two groups was performed in order to compare them with the variables that make up the indices.

In order to answer the research hypothesis, the Pearson correlation coefficient was calculated, which allows to verify the strength of association between two variables analysed from their results, which vary from -1 to 1 (Fávero, & Belfiore, 2017). The calculation was performed by correlating the GCI and GEI variables with each other.

4 Discussion and Results

The first analysis and clusters, based on GCI data, resulted in the formation of two clusters. The first cluster is characterised by being the cluster of countries with high level of competitiveness, formed by the 36 countries that occupy the 36 first positions in the ranking of GCI countries. This cluster has higher averages for all variables compared to the average of the 140 countries that are part of GCI, and present more stable economies, with a healthier population prepared in terms of skills and expertise to contribute to productivity, providing the necessary conditions for modern economic activity through a well-developed infrastructure and financial system. The second cluster is formed by the other 104 countries that compose the GCI, ranked from the 38th position in the index ranking. This cluster is characterised by being composed by countries with a low level of competitiveness because it presents low averages for the variables analysed, suggesting that there is still a long way to go in terms of factors that drives global competitiveness.

The variables Innovation Capability and ICT Adoption are fundamental to explain the difference between the clusters formed. The mean of the cluster composed by countries with a high level of competitiveness for the two variables differ by 51% and 40.5% of the second cluster, respectively. These averages differ the most if we analyse the 12 variables. Together, Innovation Capability and ICT Adoption are capable of fostering efficiency and fostering innovation for economic progress.

The second cluster analysis performed from the GEI data also resulted in the formation of two clusters. The first cluster identified is made up of 55 countries, all of which are among the 65 first places in the GEI ranking, so they are characterized as countries with high level of entrepreneurship, where there is good business opportunities and population is prepared to perceive these opportunities, marked by the high use of technology and offering good financing conditions, with companies focused on creating innovative products and internationalization. The second cluster is characterized by countries with a low level of entrepreneurship, being composed of 82 countries that occupy from the 50th position of the GEI ranking, marked by very low scores for all variables. The average of the variables in the first cluster more than double in relation to the second cluster. Clusters are distinguished mainly in terms of risk acceptance, technological absorption at the corporate level, investment in applied research aimed at process innovations, internationalization of companies and investment in venture capital.

By comparing the clusters formed through the analysis of clusters performed for the GCI and GEI data sets, it is possible to verify a certain similarity between the countries that make up the cluster of countries with a high level of competitiveness and the cluster countries with a high level of entrepreneurship, as there is similarity between the cluster of countries with low level of competitiveness and the cluster of countries with low level of entrepreneurship. The first cluster of GCI has 36 countries while the first cluster of GEI has 55, of these, 33 countries are the same. At the same time, the second cluster of the GCI has 104 countries and the second cluster of the GEI has 82, of which 73 countries are the same. Whereas 127 countries are common between the two databases, it can be said that 106 countries, or 83,5% of the countries analysed, have similar levels of entrepreneurship and competitiveness, thus suggesting the relationship between factors that impact entrepreneurship and competitiveness of countries at international level.

The analysis of the Pearson correlation coefficient between GCI and GEI and its variables revealed a high correlation of 0.908 between the two indices, accompanied by positive cross-correlations between all variables of the two indices, showing a great interaction between the variables that influence the entrepreneurship and competitiveness. The GCI showed high correlations with the variables Risk Acceptance, Opportunity Start-up and Processes Innovation of GEI, suggesting that the economy with controlled risk, taxation and satisfactory government services, with investments in research and development, coupled with a population willing to take risks exploiting business opportunities and using new technologies. In addition to having a context that encourages entrepreneurship, boosts competitiveness through these factors. Already the GEI revealed high correlations with the variables Institutions, Infrastructure, Financial System, Business Dynamism and Innovation Capability of GCI, revealing that these aspects as well as contribute to the competitiveness of a country, encourage entrepreneurship context through institutions which regulate economic activity, well-developed financial systems and infrastructure, an innovative and resilient private sector, and the ability to generate innovative ideas and new business models that are widely considered the engines of economic growth.

5 Conclusions

This work was intended to verify the relationship between entrepreneurship and competitiveness, since the former is known to foster competitiveness through entrepreneurs, who by introducing innovations in the market, drive economic growth and global competitiveness. The analyses of the GEI and the GCI allowed us to observe the factors that condition and drive each phenomenon. The similarity between the groups formed reveals that countries around the world find themselves in contexts that influence entrepreneurship and competitiveness in a similar way. A country that creates conditions for entrepreneurship, fostering the perception of opportunities as well as risk taking, also creates the conditions to encourage competitiveness at a global level. At the same time, strengthening institutions, financial and business systems, and good infrastructure conditions, as well as contributing to international competitiveness, foster entrepreneurship in the country.

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