LISBON SCHOOL OF ECONOMICS & MANAGEMENT
UNIVERSIDADE DE LISBOA

Mestrado

Ciências Empresariais

Trabalho Final de Mestrado

Dissertação

The relevance of competitiveness on entrepreneurship: evidence for different country's development stage

Manuel Amaral de Freitas dos Santos e Sousa

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Abstract

In a dynamic world as today, entrepreneurship has revealed itself as a way of standing out and gaining competitive advantages as several studies have shown in the past years. One main question that is left to understand, which we address in this work, is how competitiveness affects entrepreneurship. We used Global Competitiveness Index's 12 pillars – institutions, infrastructures, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, market size, business sophistication and innovation – which, together, define a nation's competitiveness, and used data related to the Total early-stage Entrepreneurial Activity from 2006 to 2015. Additionally, using Porter's classification, we divided countries in factor, efficiency and innovation-driven economies to understand how competitiveness affects entrepreneurship according to a country's stage of economic development. We individually check how each pillar affects entrepreneurship in general and for each stage. The results show some expected significant relations between competitiveness's pillars but also proves some concepts supress entrepreneurship.

Keywords: Entrepreneurship; Economic Development; Competitiveness Pillars; Global Entrepreneurship Monitor (GEM); World Economic Forum (WEF); Factor-driven Economies; Efficiency-driven Economies; Innovation-driven Economies.

Resumo

Num mundo dinâmico como o de hoje, o empreendedorismo revelou-se como uma forma de sobressair e de ganhar vantagens competitivas como vários estudos têm demonstrado ao longo dos anos. Uma questão que se encontra ainda por responder, a qual endereçamos neste trabalho, é como a competitividade afeta o empreendedorismo. Utilizaram-se os pilares do *Global Competitiveness Index* (GCI) – instituições, infraestruturas, ambiente macroeconómico, saúde e educação primária, formação e educação superior, eficiência de mercado dos bens, eficiência do mercado laboral, desenvolvimento do mercado financeiro, preparação tecnológica, dimensão do mercado, sofisticação do negócio e inovação – que, todos juntos, definem a competitividade de uma nação, e os dados provenientes da *Total early-stage Entrepreneurial Activity* (TEA), desde 2006 até 2015. Adicionalmente, utilizando a classificação de Porter, dividimos os países em *factor-*, *efficiency-* e *innovation-driven economies*, por forma a perceber como a competitividade afeta o empreendedorismo de acordo com o grau de desenvolvimento económico de cada nação. Verificámos individualmente como cada pilar afeta o empreendedorismo em geral e para cada estádio. Os resultados obtidos demonstram algumas relações esperadas entre os pilares da competitividade e o empreendedorismo, mas provam também que alguns conceitos suprimem o empreendedorismo.

Palavras-chave: Empreendedorismo; Desenvolvimento Económico; Pilares da Competitividade; *Global Entrepreneurship Monitor* (GEM); *World Economic Forum* (WEF); Factor-driven Economies; Efficiency-driven Economies; Innovation-driven Economies.

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Abbreviations and Acronyms

GCI Global Competitiveness Index

GDP Gross Domestic Product

GEM Global Entrepreneurship Monitor

TEA Total early-stage Entrepreneurial Activity

TEA_e Total early-stage Entrepreneurial Activity for efficiency-driven economies

TEA_f Total early-stage Entrepreneurial Activity for factor-driven economies

TEA_i Total early-stage Entrepreneurial Activity for innovation-driven economies

WEF World Economic Forum

1. Introduction

Entrepreneurship is the managerial process for creating and managing innovation (Drucker, 2014), which is an important driver of regional modernization and growth (Huggins and Thompson, 2015).

Competitiveness, according to Anca (2012), means qualitative and quantitative factors and conditions that measure the ability of selling on international markets and the effective competition at a global level, in what can be considered a multidimensional concept (Ajitabh and Momaya, 2003). It has become common to describe economic strength of an entity (eg. a country) with respect to its competitors in the global market economy in which goods, services, people, skills, and ideas move freely across geographical borders (Murths, 1998).

In recent years, renewed attention has been given to the role of entrepreneurship in economic development (Wennekers and Thurik, 1999) and, given that entrepreneurship represents the most influential and proactive phenomenon in the cultural competitiveness framework (Hult et al., 2003), this research will link the Global Competitiveness Index (GCI), with its twelve pillars, with Global Entrepreneurship Monitor's (GEM) Total early-stage Entrepreneurial Activity (TEA) index, which is defined by GEM as the percentage of 18 years to 64 years population, who are either a nascent entrepreneur or owner-manager of a new business with less than 42 months, trying then to examine how competitiveness affects entrepreneurship. Additionally, this work will distinguish developed and developing countries according to the division established by the World Economic Forum's (WEF) Global Competitiveness Report, which, separates the countries in factor, efficiency and innovation-driven economies (Porter et al., 2002).

After this introductory chapter, this paper is composed by five more sections. We present the literature review divided in three sub sections: entrepreneurship and the economic growth; competitiveness and entrepreneurship; and entrepreneurship and economic development. In the third section, we show the framework and the hypotheses to be discussed. In section four, the methodological issues are presented. In the fifth section, we present and discuss all the results. Finally, the conclusions, implications, limitations and future research avenues are analysed.

2. Literature Review

2.1. Entrepreneurship and the Economic Growth

Naudé (2010) claims that, nowadays, it is taken for granted that entrepreneurship is indispensable for economic growth. If there are more entrepreneurs in the economy, it will grow faster (Dejardin, 2002).

Thus, Naudé (2010) adds that whereas there may be a genuine appreciation of the role of entrepreneurship in the economic development process, the attention has been largely confined to advanced economies. As such, the literature regarding entrepreneurship in developing countries is incomplete and still falls short of an adequate understanding of entrepreneurship in the development process or, at least, relatively less is known about independent entrepreneurs in developing countries (Naudé, 2010; Chari and Dixit, 2015).

By definition, entrepreneurship requires making investments today without assurance of what will be the returns tomorrow (Acs and Armington, 2004). These investments bring capital which has an important effect on economic growth (Leitão and Rasekhi, 2013).

Rupasingha et al. (2006) found that there is a strong, statistically significant relationship between entrepreneurship and growth in U.S. nonmetropolitan, and less developed areas, which they call lagging areas. This rational can be extrapolated to developing countries. Stephens et al. (2013) found a similar result for the Appalachian region and also found evidence that the positive role of entrepreneurship in supporting growth relates to having a greater share of opportunity entrepreneurs – i.e. highly creative and innovative individuals who identify and exploit an opportunity - as opposed to necessity entrepreneurs – i.e. individuals who are forced to start a business because of a lack of other employment options (Acs, 2006).

In the 90's, a number of developing countries have enacted premarket reforms aimed at developing their markets to promote entrepreneurship (Hoskisson et al., 2000). As a result of these reforms, these countries are becoming major economic strengths in the world, and entrepreneurship (including the startup and growth of formal businesses)

has been credited as playing 'a key role in this development' (Bruton et al., 2008, p. 1). Cho and Honorati (2014) complement that, in recognition of the importance of self-employment in job creation, interventions to promote entrepreneurial activities are increasingly being implemented around the developing world.

Other authors maintain that innovative SMEs with entrepreneurial initiatives play an important role in promoting economic growth (Spithoven et al., 2013). In this growth alignment, less competitive regions strive to enhance their knowledge infrastructures in efforts to attract medium-tech manufacturing and high-tech services (Leydesdorff and Meyer, 2006).

Porter et al. (2001) describe that as economies grow from low to middle-income status, global competitiveness becomes investment-driven, as economic growth is progressively achieved by harnessing global technologies to local production. Foreign direct investment, joint ventures and outsourcing arrangements help to integrate the national economy into international production systems, thereby facilitating the improvement of technologies, the inflows of foreign capital and technologies that support economic growth. In most economies, the evolution from middle-income to high-income status involves the transition from a technology-generating economy, one that innovates in at least some sectors, at the global technological frontier.

2.2 Competitiveness and Entrepreneurship

Newall (1992) declared that competitiveness is not an abstract economic concept as it speaks directly to whether a nation's economy can provide a high and rising standard of living for our children and grandchildren. For Schwab (2010), it is a set of institutions, policies and factors combining to determine the level of productivity of an economy and its corresponding capacity to generate wealth and returns on investments and determining the potential for economic growth. Kalimeris (2012) suggests that there is a direct and positive relationship between economic growth and competitiveness. This, results in companies getting well rewarded and therefore able to generate the resources necessary to supply an appropriate infrastructure for the

provision of public services and support for the socially disadvantaged parts of society (Ferreira et al, 2017).

In the new economies of the late 20th and 21st centuries characterised by globalisation and growing competition, innovation has emerged as a major source of competitive strength, and competing through innovation has become a successful paradigm for firms in many industries (Tirupati, 2008), being innovation a decisive challenge to global competitiveness (Farinha et al., 2016).

These and other points of study are presented by the World Economic Forum since 2005. According to Peréz-Moreno et al. (2016), one of the most widely used competitiveness indicators amongst academics, policy-makers and business leaders, the Global Competitiveness Index (GCI) focuses on both, macroeconomic and microeconomic factors, or "pillars" of competitiveness. The pillars that are equally determinants for a level of development cannot be totally compensated by each other, since the capacity to increase the productivity of an economy requires all of them, to a large extent. The deficiency in one key pillar of a country's development level may obstruct transformative forces that drive future economic growth and lessen opportunities, irrespective of whether the composite index of competitiveness increases or decreases.

As for these framework conditions, national conditions and supporting institutions, in the understanding of Stenholm et al. (2013), create a fertile environment for new ventures. In addition, studies examining this topic have, in large measure, focused on the variance in the rate of entrepreneurial activity across countries and have neglected to consider how these same country-level institutional arrangements might influence the quality of entrepreneurial activity.

Petuškienė and Glinskienė (2017) define entrepreneurship as setting up business and/or developing business ideas, the creation and commercialisation of innovations that, in turn, drives changes in the political, cultural, economic, legal and social environment, and also opens up opportunities to compete in the market at micro level as well as improve national competitiveness at macro level. In their opinion, this definition best describes the economic aspect of entrepreneurship and emphasizes its impact on changes in the environment and national competitiveness. This relation, of entrepreneurship with competitiveness, is explored by several other authors.

Entrepreneurial activity is at the heart of innovation, productivity growth, competitiveness and job creation (Grilo and Thurik, 2005; Amorós et al. 2012). Its promotion is an essential component of a policy designed to improve competitiveness (Cuckovic and Bartlett, 2007). On the other hand, Acs and Amorós (2008) suggest that as the competitiveness and economic growth of the region increase, entrepreneurial dynamics decrease. They also add that for developing countries, competitiveness is more oriented to structural production efficiency instead of enhancing the entrepreneurial dynamics of the country.

The main argument of this study is the impact of competitiveness on entrepreneurship and if it differs for countries at different stages of economic development. For highly developed countries we expect high competitiveness levels to positively impact the entrepreneurial activity and subsequent economic performance. For relatively poor countries it is more uncertain what high start-up rates stand for, in terms of an industrial organization conducive to innovation and economic growth.

2.3 Entrepreneurship and economic development

There is a great diversity in the level and time-series pattern of entrepreneurship across countries, some studies presenting the relationship between entrepreneurship and economic development as a positive relationship (e.g.: Wennekers and Thurik, 1999; Wong et al., 2005) and other studies presenting the opposite (e.g.: Carre and Thurik, 2003; Acs et al., 2008). Acs et al. (1994) show that the major reason for this diversity is the stage of economic development. These authors also show that the negative relationship between entrepreneurship and economic development persists after controlling for a number of other factors.

There are various ways in which entrepreneurship may affect economic growth (Acs and Amorós, 2008). Entrepreneurs may introduce important innovations by entering markets with new products or production processes (Acs and Audretsch, 1990; 2003). They may enhance our knowledge of what is technically viable and what consumers prefer by introducing variations of existing products and services in the market (Van Stel, et al., 2005).

Wennekers et al. (2010) suggest early-stage entrepreneurial activity may be an even more important measure of entrepreneurship, where an individual's willingness and capability to take action is a crucial component for entrepreneurial activity (Stenholm, et al., 2013), which influences the countries' development.

The economic development's concept has undergone some changes through history. One of the first and most known theories was the Rostow's Theory (1960), in which there were five stages of economic development: traditional society, preconditions for take-off, take-off, drive to maturity and age of high mass consumption. More recently, Chenery and Serquin (1975), idealized three stages by dividing countries in primary production, industrialization and developed economy. The current view, introduced by Porter et al. (2001), is that economic development means increasingly sophisticated ways of producing and competing, and implies the evolution from a resource-based to a knowledge-based economy.

Porter (1990) and Porter et al. (2001) define competitiveness according to the country's economic development, distinguishing three specific stages: factor-driven, efficiency-driven and innovation-driven stage. Countries in the factor-driven stage compete through low cost efficiencies in the production of commodities or low value-added products (Acs and Amorós, 2008); in the efficiency-driven stage, countries must increase their production efficiency and educate the workforce to be able to adapt in the subsequent technological development phase; in the innovation-driven stage, countries are marked by an increase in entrepreneurial activity and a decrease in the share of manufacturing in the economy, in which, technology generates economy (Wennekers et al., 2002).

Low-income countries are, usually, countries that have not reached a significant degree of industrialization relative to their populations, and have, in most cases, a medium to low standard of living (Brixiová and Égert, 2017). For a number of years, policymakers in low-income countries have included productive entrepreneurship as a key part of their strategies for inclusive growth. In contrast to necessity (or subsistence) entrepreneurship aiming at survival, entrepreneurship can help people escape poverty and contribute to development (Bruton et al., 2013). These policies are created due to the fact that low-income regions score worse on life expectancy, competitiveness and social progress (OECD, 2017).

For high-income economies at this innovation-driven stage of economic development, global competitiveness is critically linked to high rates of social learning (especially science-based learning) and the rapid ability to shift to new technologies (Porter et al., 2001).

The principal factors that contribute to global competitiveness, and thereby improve living standards, will therefore differ for economies at different levels of development. Successful economic development is thus a process of successive upgrading, in which businesses and their supporting environments co-evolve, to foster increasingly sophisticated ways of producing and competing (Porter et al., 2001).

3. Framework and Hypothesis

This research aims to examine the relationship between the GCI's 12 pillars of competitiveness and the Total early-stage Entrepreneurial Activity (TEA), and if this relationship is different according to the stage of economic development of each country.

The relations between all variables will be presented in the following sections.

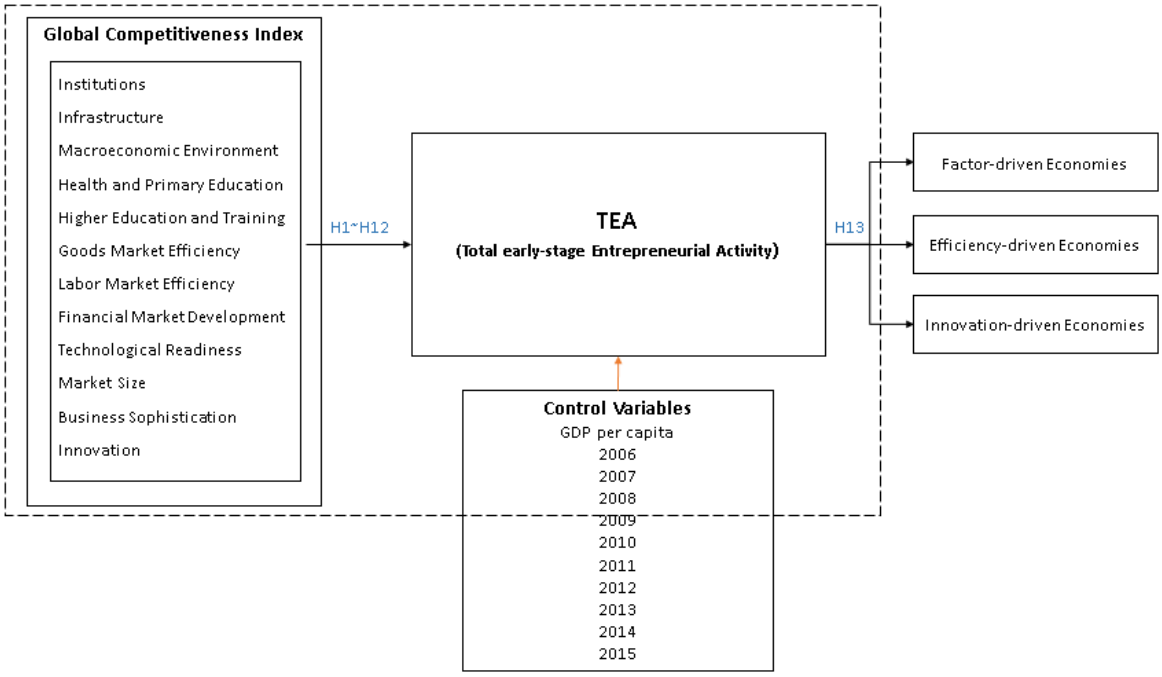

Figure 1 - Research's Framework and Hypotheses

3.1 Institutions and the TEA

As defined by the WEF, institutions are concepts related to protection of property rights, efficiency and transparency of public administration, physical security, corporate governance, business ethics and independence of the judiciary.

Institutions are, according to Sautet (2005), vital to the expansion of entrepreneurial activity, which is at the heart of the process of development and economic growth. The assumption is that institutions are rather stable and that entrepreneurs assess the institutional environment, find an opportunity, and try to

exploit it (Sine and David, 2010). It's the normative dimension of the institutional environment that influences who will (and who will not) become an entrepreneur. Some authors (e.g. Hwang and Powell, 2005; Gohmann, 2012) argue that when the setting related to institutions is more developed, entrepreneurship behaviours are higher. For instance, Hwang and Powell (2005) claim that individuals and organizations – as collections of individuals – are assumed to have the capacity to engage in creative activities where the initial conceptualization and construction of a standard or a model and its subsequent championing involve a considerable entrepreneurial activity and zeal. Keefer and Snack (1997) suggest that poor institutions that do not guarantee property rights can also interfere with growth by promoting entrepreneurs who are less able to take advantage of new technologies. Where institutions are inadequate, entrepreneurs succeed on the basis of political rather than economic criteria

Ultimately, as Andersson and Henrekson (2014) conclude, a crucial constituent of the environment for entrepreneurship is the institutional setup, because not only influences the supply of entrepreneurial activity but also its direction. This way, it can be suggested:

H1: Institutions are positively related with the TEA.

3.2 Infrastructures and the TEA

Efficient infrastructures are critical for ensuring the effective functioning of the economy as the WEF states. These infrastructures are measured by the quality and availability of transport, electricity and communication infrastructures. Each infrastructure has different objectives when promoting entrepreneurship but no single infrastructure alone favours growth. Instead, the best growth outcomes occur when firms combine different infrastructures (Roig-Tierno et al., 2015). Audretsch et al. (2015) state that investments in this segment may be particularly conducive to entrepreneurial opportunities considering infrastructures to be positively related with startup activity. Casson (1990) argued that an infrastructure that enhances cooperation between a

country's entrepreneurs will facilitate problem-solving activities and increase entrepreneurial activity. In her study, Wooley (2014) illuminates how, individually, elements of infrastructure play important roles in nascent entrepreneurship. She adds that in nascent markets where infrastructures are lacking, entrepreneurs can wait for them to be established or be part of its creation.

With these arguments, it can be suggested:

H2: Infrastructures are positively related with the TEA

3.3 Macroeconomic Environment and the TEA

WEF measures countries' macroeconomic environment through fiscal and monetary indicators, sovereign debt rating and savings rate.

The stability of the macroeconomic environment is important for business, both for short and long term decisions, and, therefore, is significant for the overall competitiveness of a country. The macroeconomic environments of some countries are more conducive to entrepreneurial behaviour while others penalize it (Arenius and Minniti, 2005). Gjelsvik and Aarstad (2016) suggest there is a potential link between macroeconomic shifts and the development of the entrepreneurial industry structure in a regional and national context. In addition, Castaño et al. (2015) argue that any initiative boosting economic activity and helping to establish a stable macroeconomic environment stimulates entrepreneurship.

Therefore, the following hypothesis is suggested:

H3: The Macroeconomic Environment is positively related with the TEA

3.4 Health and Primary Education and the TEA

This pillar considers the state of each country's state of public health as well as the quality and quantity of basic education.

A healthy workforce is vital to a country's competitiveness and productivity. Workers who are ill cannot function to their potential and will be less productive. Also

quantity and quality of basic education received by the population is increasingly important in today's economy. Primary education increases the efficiency of each individual worker (Ramoniene and Lanskoronskis, 2011) and seems important for stimulating entrepreneurship for several reasons (Reynolds et al., 1999; Sánchez, 2010). First, education provides individuals with a sense of autonomy independence and self-confidence. Second, education makes people aware of alternative career choices. Third, education broader the horizons of individuals, thereby making people better equipped to perceive opportunities and, finally, it provides knowledge and skills that can be used by individuals to develop new entrepreneurial opportunities (Raposo and Paço, 2011). Van der Sluis et al. (2005) conclude by claiming that the education effect that separates workers into self-employment and wage employment is stronger in the least developed economies, where agriculture is more dominant and literacy rates are lower. Given these statements, it is suggested:

H4: Health and Primary Education is positively related with the TEA.

3.5 Higher Education and Training and the TEA

Higher Education and Training is measured by how much a country has of quality and availability of on-the-job training, and how much value and amount of higher education.

The highest levels of entrepreneurship are linked to individuals with at least some college education (Raposo and Paço, 2011). Hynes (1996) states that education can be viewed as an important determinant of entrepreneurship. Various studies suggest that the entrepreneurial role can be culturally and experientially acquired, and therefore influenced by education and training. Mondragón-Velez (2009) shows that both people with less than a college education (starting on secondary enrolment) and people with a higher than college or more, are more interested to become entrepreneurs, since higher educated people are more interested to have their own business, rather than only wage earning workers. It is also noticeable that, people with less than the college

education or high school education prefer to be a wage-earning worker. Working in the opposite direction, Van der Sluis et al. (2005) affirm that although higher levels of education might generate better options (more lucrative paid wage employment under better working conditions) likelihood of entrepreneurship can be decreased. Bartos et al. (2015), in their study, concluded that the university graduates more often start their own business because they perceive it as a mission whereas the entrepreneurs without a higher degree are more often forced to start their own business by circumstances of life. As they cannot find a job they decide to start a company to make their living.

With the arguments pictured above, it is suggested:

H5: Higher Education and Training is positively related with the TEA.

3.6 Goods Market Efficiency and the TEA

The factors that drive the intensity of domestic and foreign competition and demand conditions are the tools used by WEF to measure this pillar.

The process of change involving the composition of goods produced in an economy has interesting implications for the development of entrepreneurship itself, so that entrepreneurship may be itself endogenous in the development process (Naudé, 2010). New knowledge creates the opportunity for entrepreneurs to create new goods - although a new product into the marketplace is fraught with challenges (Andrew and Sirkin, 2003) due to the customers' resistance to change (Heidenreich and Kraemer, 2016) - to introduce new methods of production, to utilize new sources of supply, to restructure industries, and to create new markets in new regions (Schumpeter, 1934) by replenishing the pool of opportunities that is drawn upon by entrepreneurs in their pursuit of profit (Eckhardt and Shane, 2003).

Chowdhury et al. (2015) focus in countries on the efficiency-driven stage, which rely less on agricultural productivity and instead on low-cost manufacturing firms. By moving away from the agricultural sector, these countries are, naturally, subject to search for better quality of life, higher education and training levels, efficient goods markets, well-functioning labour markets, well developed financial markets, the ability to exploit the benefits of existing technologies, and a large domestic or foreign market.

Given this state, Audretsch et al. (2015) add that a relatively high competition is a direct result of the higher market size. Also, entrepreneurial opportunities could enhance the existing goods and services due to the processes' optimization (Shane and Venkataraman, 2000) but, the consequences of exploiting new things are unknown, so entrepreneurial decisions cannot be made only through an optimization process in which mechanical in which mechanical calculations are made in response to a given set of alternatives (Baumol, 1993).

Therefore, the hypothesis to be considered is:

H6: Goods Market Efficiency is negatively related with the TEA.

3.7 Labour Market Efficiency and the TEA

Labour market efficiency considers flexibility, meritocracy and gender parity in the workplace across countries.

Each organization is interested in attaining sustainably high performance indicators by virtue of its human resources and, in the first place, by virtue of improving its labor efficiency (Ngima and Kyongo, 2013). Consequently, well-organized working environment and good working conditions can improve employees' job satisfaction which will result in higher labour efficiency (Kuznetsova et al, 2017). The efficiency and flexibility of the labour market are critical for ensuring that workers are allocated to their most effective use in the economy and provided with incentives to give their best effort in their jobs. These markets must also ensure clear strong incentives for employees and efforts to promote meritocracy at the workplace, and they must provide equity in the business environment between women and men. Taken together, these factors have a positive effect on worker performance and the attractiveness of the country for talent (Almeida and Carneiro, 2009). This way, we suggest:

H7: Labor Market Efficiency is positively related with the TEA

3.8 Financial Market Development and the TEA

The efficiency, stability and trustworthiness of the financial and banking system is how WEF defines a country's financial market development.

Financial markets play critical roles in mobilizing savings, evaluating projects, managing risk, monitoring managers, facilitating transactions and funding new projects (Hsu et al., 2014). Therefore, the development of financial markets is critical for a nation's innovation (Schumpeter, 1934) just like a deep financial market leads to higher growth (Gregório, 2016). Rajan and Zingales (1998) claim that firms interact with banks every day to finance their current operations and future investments and, therefore, are directly affected by financial market development. In particular, financial market development can facilitate incumbent growth by reducing financial constraints on funding investment opportunities.

Poor countries, with a weak financial system, are confined in a vicious circle, where poor financial development leads to poor economic performance and, in turn, pitiable economic performance leads to poor financial development (Fung, 2009)

Given the arguments above, the following is suggested:

H8: The Financial Market Development is positively related with the TEA.

3.9 Technological Readiness and the TEA

In today's globalized world, technology is increasingly essential for firms to compete and prosper but, as Porter (2000) points out, the rapid advancement of technology makes firms lose global competitiveness if they do not prioritize their efforts to keep up with modern technology. Technological readiness considers the adoption of technologies by individuals and businesses.

The technological readiness, as a competitiveness pillar, measures how a country implements existing technologies to increase productivity (Khan, 2017). Richey et al. (2007) suggest that the firm's ability to manage the usefulness of a technology may be key to gaining a competitive advantage. As Szabo and Herman (2014) point out, it is widely recognized that technology and innovation have a positive impact on the

entrepreneurial performance and have a significant role in the social and economic development through the created output. Other issue is that as new technologies often require new skills, the lack of human capacity has been one explanation for the failure of many developing countries to fully exploit the existing global technologies (Lee, 2001)

Given such arguments above, it is suggested:

H9: The Technological Readiness is positively related with the TEA

3.10 Market Size and the TEA

Market Size is defined as the size of country's domestic and export markets.

Entrepreneurship is the manifest ability and willingness of individuals, on their own, in teams, within and outside existing organizations, to introduce their ideas in the market, in the face of uncertainty and other obstacles, by making decisions on location, form and the use of resources and institutions (Wennekers and Thurik, 1999). Startups play an important role in re-establishing market equilibrium. Okamuro and Kobayashi (2006) exposed both firm density and regional growth rate as indicators for entrepreneurship and, as the results of Sato et al. (2012) study show, a larger market stimulates potential entrepreneurship and provides the workers stronger incentives to start a new business. Being so:

H10: The Market Size is positively related with the TEA

3.11 Business Sophistication and the TEA

Business sophistication is the efficiency and sophistication of business processes in the country and plays a main role in a country's economy which means that it controls the quality of a country's business networks and strategy of individual firms in general (Vesal et al, 2013). According to Schwab (2010),

business sophistication leads to higher productivity in the production of goods and services. This in turn, results in the increase of efficiency, thus enhancing the competitiveness of a nation. Countries enter a stage driven by innovation, where salaries can only be maintained through unique products that require sophisticated production processes and constant innovation (Schwab, 2014). This is the stage where business sophistication becomes relevant: when the country exhausts its traditional sources of productivity (Cuellar and González, 2015). Kabir (2016) points out opportunity perception among population as being huge due to inadequate business sophistication, entrepreneurial skills in knowledge fields and startups' activities display weakness, suggesting the need for further regulatory and business infrastructure overhaul. Lall (2001) concludes that higher incomes demand higher sophistication.

With the arguments described above, it is suggested:

H11: Business Sophistication is positively related with the TEA

3.12 Innovation and the TEA

Innovation is the commitment and capacity for technological developments.

Ever since the early work of Schumpeter, the concepts of entrepreneurship and innovation have been strongly related (Autio et al, 2014), in which he establishes the concept of "the entrepreneur as an innovator" as key figure in driving economic development (Wong et al., 2005). In his study, Veeraraghavan (2009) explains innovation and entrepreneurship are two sides of a coin. While there is a need for the innovations to occur, which should be facilitated and even encouraged deliberately by entrepreneurs, it is equally important for them to create opportunities and environment to realize those innovations. Focusing on innovation, Drucker (1998) asserts that innovation is central for entrepreneurial activity and encourages many entrepreneurs to engage in entrepreneurial activity. Summarizing, entrepreneurs' innovations encourage other entrepreneurs to enter into entrepreneurial undertakings and innovation (Duguet and Monjon, 2004).

To be tested:

H12: Innovation is positively related with the TEA.

3.13 GCI's Pillars Impact, the TEA and the stage of economic development

Throughout the literature, we found numerous agents deepening the study of the countries' economic development with competitiveness and how it affects entrepreneurship.

Several authors (e.g. Hwang and Powell, 2005; Gohmann, 2012) argue that when the context related to institutions is more developed, entrepreneurship behaviours are higher. Van der Sluis et al. (2005) claim that the education effect that separates workers into self-employment and wage employment is stronger in the least developed economies, where agriculture is more dominant and literacy rates are lower. As for Arenius and Minniti (2005), they state that education and entrepreneurship can be more pronounced in the developed countries rather than in developing countries.

Vivarelli (2014) provides the example for innovation-driven economies where Research and Development-based product innovation is much more present than for developing countries (and almost absent in factor-driven economies), thus weakening the influence of the component of technological change on local employment. He also enhances that developing countries (especially low-income countries) display a very limited capacity either in terms of in-house corporate R&D by the domestic firms, or in terms of public investment in R&D. This means new technologies and innovations are imported through licenses, and especially through the import of intermediate and capital goods from richer countries. This justifies why most entrepreneurial activities in developing countries are concentrated in non-technological priorities which its job creation might not be enough (John et al., 2016) so, although innovation may encourage entrepreneurs, different impacts can be noted between developing and developed countries.

Fung (2009) explains that poor countries, with a weak financial system, are confined in a vicious circle, where poor financial development leads to poor

economic performance and, in turn, low economic performance leads to poor financial development.

The technology gap between developing and advanced countries has been increasing during the last few decades (Lee, 2001). Also, technology is widely considered to be a crucial factor of input in the industrialization and development of countries.

Other subject is pointed out by Sato et al. (2012), which is the fact that population density, with direct impact on a country's market size, may be negatively related with entrepreneurship.

Acs et al. (2008), in their empirical model, suggest that as the economic growth and competitiveness increase, the entrepreneurial dynamics decrease, consequently, as Wennekers et al. (2005) conclude, the level of economic development has to be taken into account to evaluate whether entrepreneurial dynamics are high or low.

Considering all the arguments stated above, we suggest:

H13: The GCI's pillars impact on the TEA is distinct according to the country's stage of economic development.

4. Methodology

4.1 Data

In order to assess how competitiveness is related with entrepreneurship and how this relationship goes according to the countries' stage of economic development, this empirical study uses linear regressions and correlations.

The data used in this research will be taken from, as mentioned above, the Global Competitiveness Index and the Global Entrepreneurship Report.

The World Economic Forum based in Geneva started the calculations of its Global Competitiveness Index in 2005. It identifies twelve "pillars" or causative factors that influence competitiveness. These pillars are "institutions", "infrastructures", "macroeconomic environment", "health and primary education", "higher education and training", "goods market efficiency", "labor market efficiency", "financial market development", "technological readiness", "market size", "business sophistication" and "innovation". Each of these categories is broken down into a large number of subgroups, being the value for each pillar obtained as the arithmetic weighted average of the values of the subgroups, which goes from 1 to 7. Finally, using constant weights for each pillar as well, an overall competitiveness index for the entire country is calculated.

The Global Entrepreneurship Monitor (GEM) research program is an annual assessment of the national level of entrepreneurial activity, from which this study will focus on the Total early-stage Entrepreneurial Activity (TEA). This indicator comprises the percentage of 18-64 population who are either a nascent entrepreneur or owner-manager of a new business. It provides a measure of the level of new businesses creation in the economy; it covers both individuals in the process of starting a business and those who are running businesses with less than three and a half years old (GEM, 2013).

4.2 Dependent Variable

"The Global Entrepreneurship Monitor is the world's foremost study of entrepreneurship" (*in* gemconsortium.org). It began in 1999, as a joint project between

Babson College and London Business School, with only ten participating countries, having expanded to over 70 countries making it the largest and most developed research program on entrepreneurship in the world.

The aim of this project is to understand why some countries are more 'entrepreneurial' than others. Local researchers gather information regarding each economy in terms of entrepreneurial behaviour, attitudes and how the national context affects entrepreneurship, contributing with valuable perceptions on the entrepreneurial environment.

Considering data from the GEM Reports from 2006 until 2015, we registered the yearly TEA rates measured in that period.

4.3 Independent Variables

GCI's twelve pillars of competitiveness are grouped into three main country groups: factor-driven, efficiency-driven and innovation-driven economies, which encompass 111 components. Pillars are measured by the scores from 1 to 7 and components by the scores from 0 to 100. Finally, by using constant weights for each pillar an overall competitiveness index for the entire country (or region) is obtained. The factor groups scale is established according to each country's GDP per capita, determining in which stage of economic development is each country at.

The independent variables chosen are the competitiveness's 12 pillars mentioned before: institutions, infrastructures, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, market size, business sophistication, and innovation.

4.4 Control Variables

To increase the results' robustness and analyse TEA evolution and consistency, we took data from 10 consecutive years, from 2006 to 2015. Besides these 10 years, we also used the Gross Domestic Product per capita, representing the economic growth (Hussain et al, 2017):

- GDPpc – GDP per capita is a measure of a country's economic output that accounts for population. It is measured as the ratio of the country's gross domestic product, which is a monetary measure of the market value of all final goods and services produced in a period of a whole country or region, by its total population. Comparisons of national wealth are frequently making it one of best measurement instruments of a country's standard of living. It tells how prosperous a country feels to each of its citizens.
- Years – For all but one year, several *dummy* variables were included, where each one takes the value 1 when the data referred to a specific year and 0 when the data is not referred to that year.

4.5 Partition Variable

Besides testing the hypotheses for all the countries in the sample, this research also tests hypotheses for different subsamples. In order to assess the relation between competitiveness and the TEA according to the countries' development type, we had to divide the data set into three different partitions. The classification, according to the stage of each country's development, was presented in each GEM report analysed. Consequently, the countries are divided in factor-, efficiency- and innovation-driven, according to their GDP.

4.6 Sample

The Global Competitiveness Index includes information for almost countries in the world and also aggregates results by regions like Europe or Asia. Unfortunately, the GEM does not comprise a dataset so extensive, as does not study all the countries. From 2006 to 2015, GEM only released reports on the TEA for an average of 57 countries per year, which accounts for a total of 562 observations. By crossing this data with the one provided in the GCI, we reached a final sample of 558 observations.

Although GEM exists since 1999, the GCI only started in 2005 and the time this study was made there wasn't data available for the biennium 2016-2017, so we chose to study the 10 most recent years, from 2006 to 2015.

5. Results

This chapter intends to present the analysis of the relations between the variables described above. With the objective of checking the veracity of the hypotheses mentioned, we used a correlation analysis followed by a multiple linear regression analysis (Pooled OLS).

All the parameters were statistically treated on software Statistical Package for Social Sciences (SPSS).

5.1 Data Presentation

In order to assess how entrepreneurship (TEA) is affected by the control and independent variables defined, we created 4 different Models of study. Model 1 considers all the data in, and there is no partition according to the countries' economic development. Model 2 is where we can analyse how competitiveness is related with entrepreneurship for factor-driven economies. Model 3 and Model 4 follow the same pattern of relation of Model 2 but for efficiency- and innovation-driven economies, respectively.

5.2 All countries (Model 1)

We start by analysing the regression results for TEA for all countries (Model 1), we can see that our independent variables can explain 52,8% of the TEA's variance (R^2= 0,528 and R^2 Adjust. = 0,506). As for the first variable, although Institutions (beta= 0,048; t-value=0,508; n. s.) confirm a positive relation between Institutions and the TEA, it is not significant, therefore we do not accept hypothesis **H1**. The second variable, Infrastructures (beta= -0,213; t-value= -2,437; p<0,05), presented results against what was expected: the relation is negative and significant, not supporting **H2**. Regarding Macroeconomic Environment (beta=0,036; t-value=0,935; n.s.), we do not accept **H3** as the results are not significant. When checking Health and Primary Education (beta= -0,265; t-value= -3,967; p<0,001) we find surprising results, as the relation with the TEA is negative and strongly significant. Therefore we cannot accept

H4. In what concerns Higher Education and Training (beta= -0,014; t-value= -0,126; n.s.) we do not accept **H5** as the results are not significant. The results obtained in the relation with Good Markets Efficiency (beta= -0,268; t-value= -2,683; p<0,01) corroborate **H6** as it is negative and with a good significance. In Labor Market Efficiency (beta= 0,351; t-value= 6,281; p<0,001) we find, as expected, a positive and strong significant relation, therefore, confirming **H7**. Concerning the relation between the TEA and the Financial Market Development (beta= 0,059; t-value= 6,284; n.s.) we find no significance, not accepting **H8**. As for Technological Readiness (beta= -0,384; t-value= -3,037; p<0,01), we find a surprising result. The relation between this pillar and the TEA has a good significance and it is negative, which goes against **H9**. Regarding the Market Size (beta= -0,129; t-value= -2,281; p<0,01), just like the previous hypothesis, the relation is negative and significant, not confirming **H10**. With the results obtained for the relation between TEA and Business Sophistication (beta= 0,336; t-value= 2,705; p<0,01) we can confirm **H11**. Finally, Innovation (beta= -0,162; t-value= -1,456; n.s.) has a surprising result as it hasn't a significant relation with the TEA.

Table 1 - Regression Analysis between the 12 Pillars of Competitiveness and the control variables with the TEA.

Variables	TEA_T (N=558)
	Model 1
1st pillar: Institutions	**0,048** (0,508)
2nd pillar: Infrastructures	**-0,213*** (-2,437)
3rd pillar: Macroeconomic Environment	**0,036** (0,935)
4th pillar: Health and Primary Education	**-0,265***** (-3,967)
5th pillar: Higher Education and Training	**-0,014** (-0,126)
6th pillar: Goods Market Efficiency	**-0,268**** (-2,683)
7th pillar: Labor Market Efficiency	**-0,351***** (6,284)
8th pillar: Financial Market Development	**0,059** (0,969)
9th pillar: Technological Readiness	**-0,384**** (-3,037)
10th pillar: Market Size	**-0,129**** (-2,821)

11th pillar: Business Sophistication	**0,336**** (2,705)
12th pillar: Innovation	**-0,162** (-1,456)
Control Variables:	
GDP per capita ($)	**-0,020** (-0,282)
2007	**-0,065** (-1,511)
2008	**-0,046** (-1,049)
2009	**-0,025** (0,523)
2010	**0,035** (0,729)
2011	**0,091** (1,863)
2012	**0,159**** (3,048)
2013	**0,169**** (3,235)
2014	**0,213***** (4,093)
2015	**0,231***** (4,429)
R^2	**0,528**
R^2 Adjusted	**0,506**

Note: ***p<0,001; **p<0,01; *p<0,05. Standardized Beta Values and t-values in brackets.
Dummy Variables: 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014 and 2015 (1= values of that year and 0= values of other year). The year 2016 was excluded. N=558

5.3 Factor-driven Countries (Model 2)

This model presents the same relation tested in Model 1, but only for countries classified as factor-driven economies. Here we can observe that the independent variables can explain 73,3% of the TEA's variance (R^2= 0,733 and R^2 Adjust. = 0,623). We cannot accept **H1** as the results obtained for the relation between Institutions (beta= -0,253; t-value= -1,612; n.s.) and the TEA have no significance. Next, we do not confirm **H2** as the values for Infrastructures (beta= -0,403; t-value= -2,018; p<0,05) are negative and significant. Concerning the Macroeconomic Environment (beta= 0,090; t-value= 0,937; n.s.), it's not significant the relation obtained so we can't accept **H3**. Next, we find the relation between Health and Primary Education (beta= -0,391; t-value= -2,694; p<0,01) and the TEA, which is negative and significant, result that goes

against **H4**. Looking to Higher Education and Training (beta=0,436; t-value= 2,323; p<0,05), the obtained relation is positive and significant, which confirms **H5**, making it impossible to be accepted. The results obtained for Goods Market Efficiency (beta= 0,110; t-value= 0,434; n.s.), Labor Market Efficiency (beta= 0,110; t-value= 0,894; n.s.), Financial Market Development (beta= 0,028; t-value= 0,141; n.s.) and Technological Readiness (beta= -0,157; t-value= -0,826; n.s.) are all not significant, therefore we cannot accept, respectively, **H6**, **H7**, **H8** and **H9**. As for the Market Size (beta= -0,557; t-value= -4,999; p<0,001) and its relation with the TEA, we find a strong and negative relation, which goes against what was expected thus we do not accept **H10**. The last two independent variables, Business Sophistication (beta= 0,073; t-value= 0,264; n.s.) and Innovation (beta= 0,262; t-value= 1,010; n.s.) do not have a significant relation with the TEA, hence we do not confirm **H11** and **H12**, respectively.

Table 2 - Regression Analysis between the 12 Pillars of Competitiveness and the control variables with the TEA_f.

Variables	TEA_f (N=79)
	Model 2
1st pillar: Institutions	**-0,253** (-1,612)
2nd pillar: Infrastructures	**-0,403*** (-2,018)
3rd pillar: Macroeconomic Environment	**0,090** (0,937)
4th pillar: Health and Primary Education	**-0,391**** (-2,694)
5th pillar: Higher Education and Training	**,0436*** (2,323)
6th pillar: Goods Market Efficiency	**0,110** (0,434)
7th pillar: Labor Market Efficiency	**0,110** (0,894)
8th pillar: Financial Market Development	**0,028** (0,141)
9th pillar: Technological Readiness	**-0,157** (-0,826)
10th pillar: Market Size	**-0,557***** (-4,999)
11th pillar: Business Sophistication	**0,073** 0,264
12th pillar: Innovation	**0,262** (1,010)
Control Variables:	
GDP per capita ($)	**-0,020** (0,037)

2007	**-0,065** (-0,646)
2008	**-0,046** (-0,461)
2009	**-0,025** (0,145)
2010	**0,035** (0,354)
2011	**0,091** (-0,514)
2012	**0,159** (0,465)
2013	**0,169** (-0,111)
2014	**0,213** (0,025)
2015	**0,231** (0,349)
R^2	**0,733**
R^2 Adjusted	**0,623**

Note: $^{***}p<0,001$; $^{**}p<0,01$; $^{*}p<0,05$. Standardized Beta Values and t-values in brackets.

Dummy Variables: 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014 and 2015 (1= values of that year and 0= values of other year). The year 2016 was excluded. N=79

5.4 Efficiency-driven Countries (Model 3)

Thirdly, we explore to Model 3, which contains the results for the same relations as the previous models, but for countries classified as efficiency-driven economies. It's possible to observe that the independent variables can only explain 30,3% of the TEA's variance (R^2= 0,303; R^2 Adjust. = 0,224). We start this analysis by immediately not accepting **H1** and **H2** as the relation of the TEA with Institutions (beta= 0,177; t-value= 1,380; n.s.) and Infrastructures (beta= -0,064; t-value= -0,531; n.s.) is not significant. As for the Macroeconomic Environment (beta= 0,205; t-value= 2,400; p<0,05), we discover a positive and significant relation with the TEA, as expected, so we accept **H3**. Looking to the following two pillars, Health and Primary Education (beta= 0,032; t-value= 0,361; n.s.) and Higher Education and Training (beta= 0,026; t-value= 0,204; n.s.), as their relation is not significant with the TEA, we cannot accept both **H4** and **H5**, respectively. Next, the results of Goods Market Efficiency (beta= -0,426; t-value= -2,805; p<0,01) confirm the expected sign. The relation obtained is negative and significant, therefore we accept **H6**. In the seventh pillar, Labor Market Efficiency (beta= 0,170; t-value= 1,849; n.s.), although it has a positive relation as suggested, it is

not significant, therefore we do not accept **H7**. Concerning the next three pillars, Financial Market Development (beta= -0,038; t-value= -0,306; n.s.), Technological Readiness (beta= -0,235; t-value= -1,579; n.s.) and Market Size (beta= -0,117; t-value= -1,188; n.s.), the results obtained aren't significant, consequently we do not confirm **H8**, **H9** and **H10**, respectively. When looking to the final two variables, we find strong and significant results. Business Sophistication's (beta= 0,678; t-value= 4,999; p<0,001) results confirm **H11** but Innovation's (beta= -0,570; t-value= -4,227; p<0,001) surprisingly deny **H12**, as we expected this relation to be positive.

Table 3 - Regression Analysis between the 12 Pillars of Competitiveness and the control variables with the TEA_e

Variables	TEA_e (N=245)
	Model 3
1st pillar: Institutions	**0,177** (1,380)
2nd pillar: Infrastructures	**-0,064** (-0,531)
3rd pillar: Macroeconomic Environment	**0,205*** (2,400)
4th pillar: Health and Primary Education	**0,032** **(0,361)**
5th pillar: Higher Education and Training	0,026 **(0,204)**
6th pillar: Goods Market Efficiency	**-0,426**** (-2,805)
7th pillar: Labor Market Efficiency	**0,170** (1,849)
8th pillar: Financial Market Development	**-0,038** (-0,306)
9th pillar: Technological Readiness	**-0,235** (-1,579)
10th pillar: Market Size	**-0,117** (-1,188)
11th pillar: Business Sophistication	**0,678***** (4,999)
12th pillar: Innovation	**-0,570***** (-4,227)
Control Variables:	
GDP per capita ($)	**-0,020** (-1,113)
2007	**-0,065** (-0,450)
2008	**-0,046** (-0,316)
2009	**-0,025** (-0,058)
2010	**0,035** (0,983)

2011	**0,091*** (2,345)
2012	**0,159*** (2,531)
2013	**0,169***** (3,439)
2014	**0,213**** (3,017)
2015	**0,231***** (3,779)
R2	**0,303**
R2 Adjusted	**0,224**

Note: *** p<0,001; ** p<0,01; * p<0,05. Standardized Beta Values and t-values in brackets.

Dummy Variables: 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014 and 2015 (1= values of that year and 0= values of other year). The year 2016 was excluded. N=245

5.5 Innovation-driven Countries (Model 4)

This model includes only the countries classified as innovation-driven economies. The independent variables can explain 46,2% of the TEA's variance (R^2= 0,462; R^2 Adjust. = 0,399). The first two, Institutions (beta= 0,092; t-value= 0,524; n.s.) and Infrastructures (beta= 0,026; t-value= 0,278; n.s.) have no significant relation with the TEA hence we do not accept **H1** and **H2**. In the next variable we find other surprising result as the Macroeconomic Environment (beta= -0,194; t-value= -2,126; p<0,05) has a negative and significant relation with the TEA, contradicting **H3**. Next, we check that Health and Primary Education (beta= -0,051; t-value= -0,544; n.s.), Higher Education and Training (beta= 0,010; t-value= 0,080; n.s.) and Goods Market Efficiency (beta= 0,022; t-value= 0,159; n.s.) have no significant relation with the TEA so we do not accept **H4**, **H5** and **H6**. The seventh pillar, Labor Market Efficiency (beta= 0,530; t-value= 4,978; p<0,001) provides an expected result as it has a positive and strong significant relation with the TEA, confirming hypothesis **H7**. In what concerns the Financial Market Development (beta= 0,365; t-value= 2,776; p<0,01) relation with the TEA, we accept **H8** as it is positive and significant. Regarding the next two independent variables, Technological Readiness (beta= -0,206; t-value= -1,539; n.s.) and Market Size (beta= 0,059; t-value= 0,583; n.s.), and their relation with the TEA, respectively, we do not confirm **H9** and **H10** as the results show there is no significance. For Business Sophistication (beta= -0,631; t-value= -3,756; p<0,001), **H11** is not accepted

as the results display a very strong significance and negative relation with the TEA, which is against to what was suggested earlier. Finally, the last pillar, Innovation (beta= -0,049; t-value= -0,319; n.s.) has no significant relation with the TEA, therefore **H12** is not accepted.

Table 4 - Regression Analysis between the 12 Pillars of Competitiveness and the control variables with the TEA_i

Variables	TEA_i (N=234)
	Model 4
1st pillar: Institutions	**0,092** (0,524)
2nd pillar: Infrastructures	**0,026** (0,278)
3rd pillar: Macroeconomic Environment	**-0,194*** (-2,126)
4th pillar: Health and Primary Education	**-0,051** (-0,544)
5th pillar: Higher Education and Training	**0,010** (0,080)
6th pillar: Goods Market Efficiency	**0,022** (0,159)
7th pillar: Labor Market Efficiency	**0,530***** (4,978)
8th pillar: Financial Market Development	**0,365**** (2,776)
9th pillar: Technological Readiness	**-0,206** (-1,539)
10th pillar: Market Size	**0,059** (0,583)
11th pillar: Business Sophistication	**-0,631***** (-3,756)
12th pillar: Innovation	**-0,049** (-0,319)
Control Variables:	
GDP per capita ($)	**-0,020** (1,335)
2007	**-0,065** (-0,771)
2008	**-0,046** (0,540)
2009	**-0,025** (0,536)
2010	**0,035** (-0,649)
2011	**0,091** (1,187)
2012	**0,159** (1,812)
2013	**0,169**** (2,744)

2014	**0,213***** (3,577)
2015	**0,231***** (3,368)
R^2	**0,462**
R^2 Adjusted	**0,399**

Note: ***p<0,001; **p<0,01; *p<0,05. Standardized Beta Values and t-values in brackets.
Dummy Variables: 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014 and 2015 (1= values of that year and 0= values of other year). The year 2016 was excluded. N=234

5.6 Country's Stage of Economic Development

To check the impact that each of competitiveness's pillars has on entrepreneurship and if it differs according to the development, we only needed to find one pillar that doesn't share the same relation with the TEA according to the countries' development. In the first pillar, Institutions, we found all the relations to be not significant but, as we moved to Infrastructures, we found a negative relation for factor-driven economies and not significant for the other two types. Here it's already possible not to accept **H13**. In the third pillar, Macroeconomic Environment, the impact for all three types is different, being the same for the eleventh pillar, Business Sophistication, in which we can see that, the effect these pillars cause on entrepreneurship is not significant for factor-driven economies, positive for efficiency-driven economies and negative for innovation-driven economies. Both, Health and Primary Education and Market Size, demonstrate the same relation with the second pillar, which is negative for factor-driven economies and not significant for the other two types of economic development. Higher Education and Training is the only pillar we found to be positively related with factor-driven economies. Goods Market Efficiency and Innovation, both have a negative relation with efficiency-driven economies and a not significant one with factor- and innovation-driven economies. The only pillars to positively influence entrepreneurship on innovation-driven economies are Labor Market Efficiency and Financial Market Development, not having both significant relations with factor- and efficiency-driven economies. We found for Technological Readiness, just like Institutions, that there are no significant relations to any type of development.

Summing up, and as mentioned above, we found different impacts that each pillar has on entrepreneurship regarding the stage of economic development, therefore we do not accept **H13**.

Table 5 - Competitiveness Pillars' Relation with the TEA

Variables	TEA_t	TEA_f	TEA_e	TEA_i
1st pillar: Institutions	/	/	/	/
2nd pillar: Infrastructures	-	-	/	/
3rd pillar: Macroeconomic Environment	/	/	+	-
4th pillar: Health and Primary Education	-	-	/	/
5th pillar: Higher Education and Training	/	+	/	/
6th pillar: Goods Market Efficiency	-	/	-	/
7th pillar: Labor Market Efficiency	-	/	/	+
8th pillar: Financial Market Development	/	/	/	+
9th pillar: Technological Readiness	-	/	/	/
10th pillar: Market Size	-	-	/	/
11th pillar: Business Sophistication	+	/	+	-
12th pillar: Innovation	/	/	-	/

Note: n.s. (/); positive relation (+); negative relation (-)

5.7 Discussion

This work aims to discover if and how competitiveness affects entrepreneurship. Now we'll assess more specifically in what matter do GCI's pillars influence the TEA and what can we take from the observation for all three types of countries, divided by their economic development.

We'll start this discussion by checking if there is a distinct relation for each and every stage pointed out by Porter et al. (2002). Hypothesis **H13** was raised to test if the impact of one of competitiveness's pillars on entrepreneurship is the same regardless the economic stage a country is in. Our results show it's different for every pillar, except for Infrastructures, where we found no significance for every stage, therefore proving that competitiveness has different outputs according to a country's status. The principal factors that contribute to global competitiveness will then differ for economies at different levels of development (Porter et al., 2002) demonstrating the diversity of

entrepreneurship across countries is due to the stage of economic development (Acs et al., 1994).

Institutions is the only element to which we found no significance with. As the most basic indicator of GCI, and as Sautet (2005) claims, is vital to the expansion of entrepreneurial activity, we were not able to confirm its effect on entrepreneurship rates. It was expected this indicator to have an influential position in factor-driven economies as it is where these struggling countries start to base their development, where national conditions create a fertile environment for new ventures (Stenholm, 2013).

Infrastructures had an unexpected result. Although, for factor-driven economies the lack of infrastructures was proven to influence entrepreneurship, therefore confirming Wooley (2014), in a more general overview, this indicator was expected to positively influence the entrepreneurial activity which was proven wrong. With these results, we can conclude that for less developed countries, the lack of infrastructures plays a vital role to create new opportunities for entrepreneurs whereas the more developed the country starts to become and its infrastructures to grow, less entrepreneurial intentions tend to appear.

The Macroeconomic Environment shapes countries' international business and marketing strategies (Sheth, 1992) and is significant for the overall competitiveness of a country (Arenius and Minniti, 2005). We would expect our results to present a positive relationship between this pillar and the TEA, but they resulted with no significance until we reached efficiency-driven economies where we confirmed that, at least for these countries, an improving macroeconomic environment influences the entrepreneurial activities. With this result we refute Chowdhury et al.'s (2015) position as, in their study, they determine this relation to be negative for all three types of economic development. It's in efficiency-driven economies that the macroeconomic environment starts to stabilize, therefore, and with the results obtained, we confirm that a stable macroeconomic environment stimulates entrepreneurship as Castaño et al. (2015) claim. Surprisingly, as we move forward toward the development scale, we find that in innovation-driven economies, the macroeconomic environment, as a competitiveness factor, negatively influences entrepreneurship. We suggest that this negative relation is due to well established and developed economies that create much more barriers to entrepreneurial activities when compared to less developed countries, hence moving away entrepreneurs to other targets. Here we confirm Chowdhury et al's. (2015) position concerning innovation-driven economies.

With Health and Primary Education, we obtained a contradictory result. It was expected this indicator to positively influence entrepreneurship as basic education makes people aware of career choices, broad horizons and make them better equipped to perceive new entrepreneurial opportunities (Raposo and Paço, 2011). At the less developed level, for factor-driven economies, we observed a negative relationship between this indicator and the TEA. This could be due to the low level of health conditions and education that leads people to search for other employment options, mainly self-employed, like agriculture, as they are not able to undertake more complex activities due to the low levels of literacy (Van der Sluis et al., 2005). Necessity

entrepreneurship is common at these levels. For efficiency and innovation-driven economies this indicator has no influence on entrepreneurship.

We can agree with the arguments of Van der Sluis et al. (2005), since results show that Higher Education and Training decrease the likelihood of entrepreneurship as there weren't found any significant relations for efficiency-driven and innovation-driven economies, where education levels are higher. Nevertheless, this indicator came up to be positively related with entrepreneurship for factor-driven economies. In these countries, most of entrepreneurship comes from entrepreneurs with low levels of education, more as a necessity than an opportunity (Bartos et al. 2015). Therefore, despite having these low levels of higher educated people, the influence they have on entrepreneurship is significant.

Despite Schumpeter (1934) affirming new knowledge creates opportunities for entrepreneurs to create new goods, when the market is well defined and established, great barriers exist for entrepreneurs to enter with new ideas. As Goods Market Efficiency improves, less opportunity for entrepreneurial activities tend to appear, as our results demonstrate. The relation between this pillar and the TEA is negative. Neither in innovation nor factor-driven economies we obtained a significant result but, for efficiency-driven, it was quite surprising. In these countries, as they start to stabilize economically, develop industrially and start to introduce technology (Chowdhury et al., there is room to evolve and improve the goods market as it still isn't fully established but 2015) we found that, even here, entrepreneurship lessens with economic development.

On the other hand, as the Labor Market Efficiency improves, more does entrepreneurship. Kanniainen and Vesala (2005) claimed that a relatively low number of people to choose entrepreneurship in industrialized economies where the labour market is much more intensive and efficient than in undeveloped countries but our results have shown a positive and significant relation with the TEA, making us able to refute their position. This relation could be due to the capacities of the labor itself, who have the tools to much more easily identify opportunities and develop skills towards entrepreneurial activities and intensions. These entrepreneurs end up being opportunity-driven, pulled into this endeavour more out of choice to exploit some business opportunities (Williams and Williams, 2014), which is easy to forget as it does not conform to the normative path for the majority (Cullen et al. 2014).

The Financial Market Development is one of the pillars that we start to notice its bigger influence on more developed countries. Kalimeris (2012) suggests there is a direct and positive relationship between economic growth and competitiveness, which is not significant, nevertheless, a deep financial market is more likely found in developed countries and, according to Gregório (2016), leads to higher growth. With our results we confirm this thesis once we prove that for innovation-driven economies, the relation between the financial market development of a country positively influences entrepreneurship by reducing financial constraints on funding investment opportunities (Rajan and Zingales, 1998).

The relation between Technological Readiness and the TEA revealed itself unanticipated. This came out negative and had no influence for any specific type of

development, but only for the TEA itself. Technology creates opportunities for entrepreneurs but not as much as expected. These results support Porter (2000) when he says the rapid advancement of technology makes firms and countries lose advantage if they not prioritize their efforts to keep up with modern technology. It is notable specially in factor-driven economies, where new technologies often require new skills and the lack of human capacity has been one explanation for the failure of these countries to fully exploit the existing technologies (Lee, 2001). Therefore, we can conclude that although technology is fundamental for a country's development and evolution, it can suppress entrepreneurship.

Market Size was unexpectedly negative for entrepreneurial activities as the bigger and intense it gets, less opportunities exist for entrepreneurs to take advantage of. Sato et al. (2012), in their study, got an opposite result, showing that a larger market stimulates potential entrepreneurship but, as they also mention, population density can be negatively related with entrepreneurship, assumption that could explain the reversed relation we got in our results. Not even for factor-driven economies we found a positive relation. We expected that, at this level, the market's size could somehow influence entrepreneurship

At the eleventh level of our discussion, we find Business Sophistication, in which we found another surprising result. As expected, it influences entrepreneurship, but it has a negative relation with the TEA for innovation-driven economies. Although it increases efficiency, thus enhancing competitiveness (Schwab, 2010), it does not influence positively entrepreneurship in the most developed countries. Relation that is not found negative for efficiency-driven countries, where it's fundamental for their development to be as efficient as they can be, to gain edge over other competitors. This process of sophisticating what they have and develop new processes is a potential target for entrepreneurs to exploit and take advantage of, thus contributing to the economic development of that country.

As Veeraraghavan (2009) mentions, there is a need for innovations to occur, which should be facilitated by entrepreneurs, but how entrepreneurs are affected by these innovations was what we tried to obtain with the last relation being studied. The results were unexpected. As it has an insignificant result with innovation-driven economies, it has a negative relation with efficiency-driven economies. We consider that this contrary result could be better explained with further results as it is a subject with low literature. How entrepreneurship positively affects innovation is confirmed by several authors but, as we have obtained, innovation might suppress entrepreneurship.

6. Conclusion

Considering some of the results obtained and the literature analyzed, we can conclude that competitiveness, through some of its elements, influences the entrepreneurial activity.

How competitiveness affects entrepreneurship depends on the topics we're facing. As competitiveness is divided in twelve pillars, as we saw, each and every one of them created different outputs on entrepreneurship. We found that the only pillars that have a significant relationship are: Infrastructures, Health and Primary Education, Goods Market Efficiency, Labor Market Efficiency, Technological Readiness, Market Size and Business Sophistication. Of these factors, only Business Sophistication influences positively entrepreneurship, suggesting that the others suppress the occurrence of entrepreneurship.

By deepening the analysis on the economic development stage, we found that the pillars that influence entrepreneurship on factor-driven economies are Infrastructures, Health and Primary Education, Higher Education and Training and Market Size, being Higher Education and Training the only factor that does not suppress entrepreneurship. On efficiency-driven economies, the significant pillars are Macroeconomic Environment, Goods Market Efficiency, Business Sophistication and Innovation, where the positive impact was found in Macroeconomic Environment and Business Sophistication. Finally, the pillars that affect entrepreneurship on innovation-driven economies are Macroeconomic Environment, Labor Market Efficiency, Financial Market Development and Business Sophistication. This last one and Macroeconomic Environment suppress entrepreneurship in these, most developed, countries.

How competitiveness affects entrepreneurship is a relation not easily found in the literature, making this research the first one that dissociates the GCI's 12 pillars and compares them with the TEA, including a comparison between the economic development stages.

6.1 Theoretical Implications

It is not possible to conclude anything based only on the overall result once that the development also influences the impact competitiveness has on entrepreneurship.

Some pillars should be more influent, either negatively or positively for some types of development than others. As an example, Institutions was expected to have an effect on factor-driven economies, which was not verified. This could be due to the small sample available for the countries in this stage of development.

6.2 Managerial Implications

Policy managers and governments should implement training programs and policies that promote entrepreneurship differently, according to the level of development stage of their economies. These type of measures make the perfect analysis of the relation between competitiveness and entrepreneurship impossible once the countries are not under "*ceteris paribus*".

Also, as the level of development is relevant and the policy practiced in each country is different, there will be countries that will try to develop better some conditions than others, even if they're not lacking resources in them. This can be noticeable in more developed countries, where some may want to develop more their labor market efficiency to create conditions for everyone in obtaining good working conditions, and other countries may want to put their efforts in innovation by investing huge amounts in R&D.

As in factor-driven economies, the efforts should be directed more to the bases of the organizations, in institutions and infrastructures, to create good foundations that can support the country developing in a healthy way. Although, due to policies and their policy managers, these directions are not always followed, resulting in the country's stagnation or even underdevelopment.

6.3 Limitations and Further Research

We have analysed the period between 2006 and 2015 and the countries comprised in the GEM's report for these years. As the results show, we obtained indications that competitiveness influences entrepreneurship and what relations the pillars have with the TEA but it's important to understand why are these relations like this. What exactly influences positively or suppress entrepreneurship.

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