LUND UNIVERSITY
School of Economics and Management

Master programme in Innovation
and Spatial Dynamics

Entrepreneurship matters in Europe, but what matters for Entrepreneurship?

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Abstract: Economies have long been based on systems that emphasize production and explain results. In today's increased global competitiveness, the maturing capitalism advocates varied and lasting spatial concentrations as well as country-specific characteristics, National Innovation Systems. Even entrepreneurship has been given more and more attention in economic development and its importance in the implementation of prior innovations. On the other hand, National Innovation Systems have overlooked entrepreneurial activity in the economy while the Entrepreneurial Ecosystems has been neglected from the impact of National Innovation Systems. This research defines, describes and locates the national elements that support entrepreneurship, and then investigates which mechanisms as in variations associated with nationally successful entrepreneurship. The paper concludes that the intensity of a nation's integration into the Entrepreneurial Ecosystem depends on the ability to invent and upgrade and above all; the aggregated engagement within the National Innovation System.

Key words: *National Innovation System, Entrepreneurship, Entrepreneurial Ecosystems, Innovation, Porter's Diamond of National Advantage*

EKHS31
Master thesis (15 credits ECTS)
June 2017
Supervisor: Mikhail Martynovich, Kadri Kuusk
Examiner: Lea Fuenfschilling
Word Count: 10 903

PREFACE

I would like to thank my supervisors Mikhail Martynovich and Kadri Kuusk, who has been my source of knowledge and expertise along the development of the research. Your contributions have been essential in this research and I am very grateful that you took the time to supervise me.

Despite blood, sweat and tears, it has been both exciting and educational, but now it is done. Graduation is around the corner and I look forward to and am motivated for what is to come.

Thank you

Lund University 2017-05-31

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1. INTRODUCTION

The introduction presents the background of the chosen topic, literature review, the purpose of this study and the research question, the section ends with the disposition. This section aims to provide a broader insight into National Innovation Systems and Entrepreneurial Ecosystems.

1.1 BACKGROUND

Industries want to be better, faster and cheaper which is fundamental to be a part of global competitiveness (Acs et al. 2017; Narula & Guimon, 2009; Valliere & Peterson 2009). It is a time when digitization and simple innovative consumer compatibility apps are decaying each other and at the same time it is significantly harder to change high-regulated industries. Wennekers and Thurik (1999) claim that if we go back to the 1960-1970's, a period in which the academic and political interest in many Western countries increased and above all, interest in the market's demand management as well as diminished interest in the causes of economic growth.

Up until now, several studies have highlighted changes in the world economy from the 1970s. Attention has been directed against the movement from large to small businesses. Interest in economic growth in Europe and its underlying factors took off during the 1980s, when stagflation was a fact (Wennekers & Thurik, 1999). The resurgence of small business and the revival of entrepreneurship were followed by millions of entrepreneurs' commitment. The economic activity was created from intensification of globalization and the growth circles in the fragmentation of the market and technological development (Acs et al. 2017; Carlsson, 1992). European economy was affected by the pervasiveness changes in the world economy and the technical development that created structural changes (Carlsson, 1992; Audretsch & Thurik, 1998).

> "Some may see globalization as a trend in search of its 'second breath.' Yet, the relative contraction of international trade and investment flows does give even more strategic importance to the two sides of global innovation: on one hand, more emerging countries are becoming successful innovators, and on the other hand, an increasing share of innovation benefits stem from cross-border co-operation." (Bruno Lanvin, INSEAD Executive Director for Global Indices; Dutta, Lanvin & Wunsch-Vincent, 2016)

Additional, Porter (2000) highlights that, during the 1990s, were the years when research shifted focus towards geographical clusters. The economic operators link the institutions at a micro level, resulting in an economic outcome at a macro level. During this period, an anti-globalization aspect was also being established, this accelerated the process of developing a global business economics ecosystem (Acs et al. 2017). Concerning the emerging anti-globalization aspect, the importance of supporting of entrepreneurship increases along with it. Globalization and revolutionary Information and Communication Technology (ICT) brought a demand for structural changes and redistribution of resources which Audretsch and Thurik (1998) explains as a requirement for entrepreneurship. Entrepreneurship has been given more and more attention in economic development and its importance in the implementation of prior innovations. Already in 1934, Schumpeter (1934) formulated that the "agents of creative destruction" and since then, entrepreneurs have been recognized as important for the elaboration of the economy.

1.2 LITERATURE REVIEW

As globalization and competition between countries is becoming increasingly important along with knowledge sharing; clustering creates mutual dependence and the acute values usefulness is economically relevant and dynamic. Since Marshall (1890) identified agglomeration economies, researchers have been fascinated by agglomeration. Economic as well as non-economic benefits arise when companies collaborate with firms in the same industry. Exchange of resources, such as human capital, specialist suppliers and infrastructure, are the key to these Marshallian externalities. On the other hand, there are Jacobian externalities, claiming that knowledge can spread inter-industry, by co-locating, a form of knowledge spill-over (Jacobs, 1969).

The institutional and organizational infrastructures are crucial to the social and cultural context, which are also essential factors for innovative activities to generate knowledge dissemination, acquisitions and inaction. National Innovation Systems draw attention to stakeholder interaction and public intervention, motivated by the concepts of systemic failure, in addition to market failures (Narula & Guimon, 2009). Already in 1995 Metcalfe introduced the importance of;

> ".. that set of distinct institutions which jointly and individually contribute to the development and diffusion of new technologies and which provides the framework within which governments form and implement policies to influence the innovation process. As such it is a system of interconnected institutions to create, store and transfer the knowledge, skills and artefacts which define new technologies" (Metcalfe, 1995).

National Innovation Systems are defined as; *"An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations*" (OECD/EUROSTAT, 2005, p. 46). Previous research has established that innovation systems have merged for the understanding of innovation from a political perspective. The system includes comprehensive resources that cooperate to generate innovation (Gogodze, 2016). The innovation systems explain the complex interactions that take place in the environment in which an actor operates. The actors are one of the main resources, the system also include financial and institutional resources but above all, it is the actors, so-called entrepreneur, that commercialize the innovation. Porter (1990, p. 125) argues further that entrepreneurship is "at the heart of national advantage". Entrepreneurship generates economic benefits such as increased employment, productivity as well as facilitates technology transferring and dissemination of knowledge, which is of eminent importance for carrying out innovations (Acs et al. 2017).

There are different definitions when it comes to entrepreneurship. Until now, several studies have highlighted factors that are associated with the new combinations of enterprise, including the individuals whose function is to carry out innovative entrepreneurship (Schumpeter, 1942; Baumol, 1993; Drucker, 1985). Throughout this research, the term Entrepreneurial Ecosystem will refer to as a social and economic environment that affects entrepreneurs that are brought together with other core actors in close geographical, institutional and relative proximity (Brown & Mason, 2017). The system is a theoretical framework used to create insights into why dynamics are plentiful and growth-oriented in certain geographical locations than others, regardless of the specific consensus.

Brown and Mason (2017) imply that globalization has suggested that development opportunities have been concentrated to geographic distances and Entrepreneurial Ecosystems are summarized as collaborative in close geographic, institutional and relative proximity. Moore (1993 p. 76) defines the ecosystem as; "*business ecosystems condense out of the original swirl of capital, customer interest, and talent generated by an innovation, just as successful species spring from the natural resources of sunlight, water, and soil nutrients*". These are the definitions that will be used throughout the research.

Trends in innovation, growth and productivity are explained by some conventional indicators, a form of snapshot. This neglects the actors' integration into a country's innovation processes. Emphasis on the theory is that linkage between actors active in innovative development is essential for interpreting the efforts into outputs (OECD, 1997). In this sense, Valliere and Peterson (2009) claim that it is of the utmost importance to focus on incentive structures for enterprise start-up and exploitation of scientific results. Strategies that promote knowledge transfer, including adequate intellectual property protection, a well-functioning venture capital market and the presence of clusters at a macro level.

Apart from that Delmar and Wennberg (2014) highlight that entrepreneurship can contribute to both productivity and economic growth, there is a general lack of research. Interest also overlaps with the revival of entrepreneurship, not in all countries, but in many Western economies. However, the behaviour of entrepreneurship as a national phenomenon is more complex. This study of National Innovation Systems directs attention to the enforcement mechanisms that could lead to variations in the contexts of entrepreneurship. An understanding of these systems can help policy makers develop approaches for enhancing innovative performance in the knowledge-based economies of today. Meanwhile, very little is known about linking the performance at a national activity and the impact of entrepreneurial activity.

1.3 RESEARCH PURPOSE

The purpose of this research is to define, describe and locate the national constituents that support entrepreneurship. To reach this aim an investigation of enforcement mechanisms that could lead to variations in the contexts of national successful entrepreneurship.

1.3.1 RESEARCH QUESTION

- *How may National Innovation Systems support Entrepreneurship through different mechanisms?*

1.4 THESIS' DISPOSITION

The first section of this research will examine the literature that underlies the Comparative Advantage of Nations, Entrepreneurship and its determinants and the National Innovation Systems. Followed by the methodological positions that followed by empirical frameworks. Based on the background facts presented about Europe's change towards more small entrepreneurs in the 1980s, a delimitation to Europe is made and the study will only treat these nations. The results of the data suggest a classification of different mechanisms that will be investigated and concluded with a conclusion.

2. THEORETICAL FRAMEWORK

The purpose of this section is to give an overview of entrepreneurship and its network business activities relative to innovation. Theoretical framework contains of three parts: The Comparative Advantage of Nations, Entrepreneurship and its determinants and finally how these supports by the National Innovation Systems.

2.1 THE COMPARATIVE ADVANTAGE OF NATIONS

Delmar and Wennberg (2014) highlights that entrepreneurship can contribute to both productivity and growth in broad terms, this demonstrates that entrepreneurship connects components of invention and commercialization. Without an entrepreneur, the invention remains at the university and the entrepreneur himself would not have any new technology to commercialize. Entrepreneurship is about the vision of the entire process, from idea to customer (Acs et al. 2017). However, the role entrepreneurship can play in developing future economic growth that balances these potentially contradictory goals is based on how they work as a motor and how they handle the innovations. Baumol (1993) argues that capital investment, training, and similar variables affect output growth, but output growth impact, with some delay, in turn, these variables. The growth results from intentional innovation and can be treated as endogenous determined in a sequential process (Grossman & Helpman, 1991).

> "To some degree, the same story can be told about the exercise of entrepreneurship, investment in innovation, and the magnitude of activity directed to the transfer of technology. These too, clearly, are influenced by past productivity growth achievements and they also, in their turn, influence future growth. Yet it would seem plausible that there is a strong streak of exogeneity in these variables, which can help to account for the outbreak and spread of industrial revolutions and for the relative decline and even for the collapse of economies that formerly were models of success". Baumol (1993, p. 260)

Porter (2011) announce that certain social groups, economic institutions and nations can thrive with a view to certain causes. Mainly, on nations and Porter (1990) suggests that the competitiveness at the national level is characterized as national productivity. Furthermore, Porter (2011) implies that a nation is comparable to a collection of industries whose economic results is determined from their competitiveness.

Globalization and increasing competition between countries is becoming increasingly important. Porter (2011) claims that national competitiveness is a central preoccupation of government and industry. Furthermore, national prosperity is based on a country's natural resources, the currency's value, interest rates and so on. Meanwhile, national competitiveness and success is based on the capacity to innovate and upgrade the existing structure, products and services. According to Porter (2000), comparative advantage is based on forward-looking and dynamic of differences in national values, culture, economic structures, institutions and history make the nation's absorption of knowledge increased. More domestic rivals create a more aggressive home-based market of supply and demand.

Porter (1990) argues that, as for companies, most competitive advantage is established through innovation and investments made primarily in skills and knowledge, as well as in physical assets and brand reputation. Porter (1990) presents The Diamond of National Advantage, these are attributes that create the national environment where companies are born. The attributes reflect how a nation has built up its field and consists of factor conditions, demand, related and supportive industries, firm strategy, chance and government.

- *Firm strategy* summarizes the domestic rivalry as well as structure and conditions which govern how businesses are created and managed within the nation.
- *Demand* summarizes the nation's market and its demand for products and services.
- *Related and supportive industries* summarize the absence or presence of industries that are internationally competitive.
- *Factor conditions* summarize the nation's position when it comes to production factors, i.e. labour, natural resources, capital and infrastructure.
- *Government* summarize as the catalyst that encourage actors to challenge and move to higher performance. Stimulates local cooperation and attaches importance to anti-trust regulations
- *Chance* summarize the opportunities for innovative actors to start new entreprenurial aktivities.

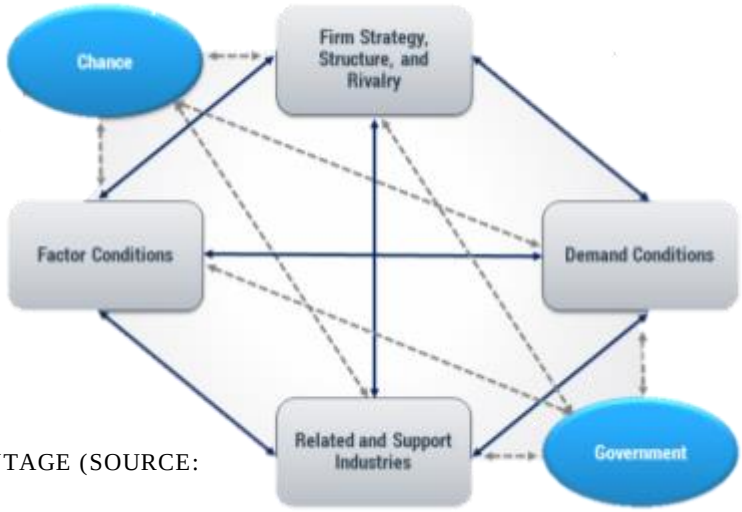


FIGURE 1 THE DIAMOND OF NATIONAL ADVANTAGE (SOURCE: PORTER, 2011)

These components affect the availability of resources and knowledge to achieve competitive advantages as well as create an environment that promotes collaboration of competitive industries (figure 1). Thus, the comparative advantage of a nation will be defined from these components, especially by the factor conditions (Porter, 1990). The Japanese statement, "We are an island nation with no natural resources", highlights that these components only serves for the nation's innovation system and competitiveness. All actors in the branch become mutually supporting and demonstrate new ways of competing and new opportunities. This lays the foundation for the direction in which nations develop, which creates an idea of the opportunities to invest and innovate. However, all nations do not face the same opportunities as the activities of the modern economy are concentrated to geographic distances (Brown & Mason, 2017). The actors who interact in a social and economic environment, in a certain geographical environment, are then defined as an Entrepreneurial Ecosystem.

2.2 ENTREPRENEURIAL ECOSYSTEM

An Entrepreneurial Ecosystem is defined as a social and economic environment that affects a geographically linked group of actors who do entrepreneurial activities (Brown & Mason (2017). Entrepreneurship is a part of the Entrepreneurial Ecosystems, which is a system of organized interactions and interdependent sub-indexes and pillars. Isenberg (2011) argue that the ecosystem is a naturally evolving system useful in both geographic and non-geographical contexts. The most commonly used term is the Embryonic ecosystems, a system where the components intend to work together to achieve a purpose.

Such network can be built by ever-changing set of dependencies and consists of both living and non-living factors. With this definition, it is clarified that it is a spatial concept, not only key factors for production or resources that justify economic performance; it is the organization of the economic activity within a geographical area (Brown & Mason, 2017). An ecosystem also generates a result, which is referred to as Ecosystem Services and Management. Acs et al. (2017) express that the pillars in the Entrepreneurial Ecosystem can be aggregated to optimize the ecosystem by required knowledge of the building blocks (figure 2);

- Entrepreneurship is the basis of activity driven by an incentive by an actor.
- An individual measure is affected by the institutional conditions
- The system is complex. Many components work together to generate system performance.

This means there is no index model that fits all, due to the system sub-indexes and pillars' need to be customized. Therefore, for these building blocks to develop a stable foundation, maintenance and constant improvement are required.

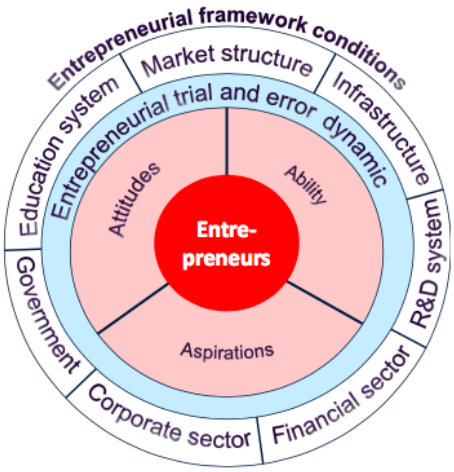


FIGURE 2 THE ENTREPRENEURIAL ECOSYSTEM CONFIGURATION (SOURCE: ACS ET AL. 2017).

Entrepreneurs are the answer to new combinations of enterprise, including the individuals whose function is to carry out innovative entrepreneurship by bringing new ideas to the market (Schumpeter, 1942; Baumol, 1993; Drucker, 1985). Wennekers and Thurik (1999, p.46) extend the definition of entrepreneurship:

> "Entrepreneurship is the manifest ability and willingness of individuals, on their own, in teams, within and outside existing organizations, to: perceive and create new economic opportunities (new products, new production methods, new organizational schemes and new product- market combinations) and 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."

The literature discusses the myth that entrepreneurship works as a social elevator where those with the highest level of enterprise and risk are most likely to succeed (Delmar et al. 2011). This refutes and suggests that small and medium-sized start-up businesses are not always able to create innovation and growth; most of them are drivers of entrepreneurship so-called necessity entrepreneurs. Additionally, The Global Entrepreneurship chooses to categorize countries through the occurrence of certain types of entrepreneurship, table 1 presented these types of entrepreneurship (Minniti, Bygrave & Autio, 2005);

High Expected Entrepreneurship Activity (HEA)	These "gazelle" companies are usually start-up and are expected to employ at least 20 people in the next 5 years. Identified by their smaller size, they have higher availability of available resources and less financial resources.
Opportunity Entrepreneurship Activity (OEA)	An expected business opportunity is utilized in relation with several other career opportunities. Comprises the definition of HEA entrepreneurs but lacks the expectation of high growth. There are limitations in the form of motivation, environmental and other barriers. They get things done and work hard to emerge.
Necessity Entrepreneurship Activity (NEA)	Other work options are non-existent or unsatisfactory and are a more "informal" form of entrepreneurs. Total Early-stage Entrepreneurial Activity (TEA) is high, most of the actors' categorize as necessity entrepreneurs.

TABLE 1 NATIONAL PREVALENCE LEVELS FOR ENTREPRENEURSHIP (SOURCE: MINNITI, BYGRAVE & AUTIO, 2005).

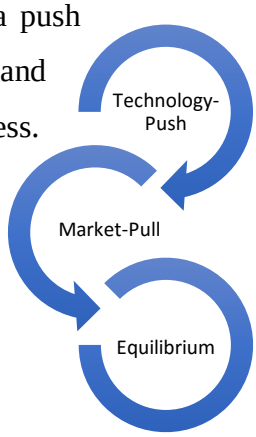
Entrepreneurships differ between countries and according to Valliere and Peterson (2009), necessity entrepreneurial rates are high in countries with low or high income per capita. In table 1, a measurement introduces. TEA (Total Early-stage Entrepreneurial Activity) measure the quantity of entrepreneurship rather than the quality and is negatively correlated with growth, freedom and competitiveness. High-expected entrepreneurship activity (HEA), also known as "blockbuster entrepreneurship", is part of the fact that only a few entrepreneurs need to succeed in creating major benefits to the ecosystem. Acs et al. (2017a) argue that these spill-over effects then contribute to the entire cluster.

High Expected Entrepreneurship Activity (HEA) and Opportunity Entrepreneurship Activity (OEA) has a systemic role in the ecosystem, and valued companies are expected to have an important role in quality of entrepreneurship. Brown and Mason (2017) claim that the quality of the Entrepreneurial Ecosystem is based on; policy, education, programs given by the government, as well as R&D transfer, infrastructure, internal market dynamics and entry regulation, physical infrastructure, as well as cultural and social norms. Further, Ace et al. (2017a) argue that considerable evidence clarifies that exogenous incumbent companies play a key role in ecosystems. A traction for skilled labour, knowledge game-over as well as customers. Additional, Schumpeter (1942) characterizes entrepreneurship and economic dynamism as "creative destruction". Schumpeter (1942) implies that entrepreneurship is not a permanent form but rather a career activity, the *Creative destruction* (Schumpeter, 1942, pp.83-84);

> "A system—any system, economic or other—that at *every* given point of time fully utilizes its possibilities to the best advantage may yet in the long run be inferior to a system that does so at *no* given point of time, because the latter's failure to do so may be a condition for the level or speed of long-run performance. /…/ Every piece of business strategy acquires its true significance only against the background of that process and within the situation created by it. It must be seen in its role in the perennial gale of creative destruction; it cannot be understood irrespective of it or, in fact, on the hypothesis that there is a perennial lull."

Schumpeter (1934) presents entrepreneurship as a component of an economic function, where the entrepreneur takes the role of risk taker and innovator of innovation with the desire to expand its business. Several evidences argue that entrepreneurship is fundamentally a localized phenomenon, with the ecosystem acknowledging how geographical location affects the creation, discovery and exploitation of entrepreneurship opportunities. However, Brown and Mason (2017) also elevates non-local interaction between actors and for clusters, global pipelines are promoted. In terms of clusters and vibrant economies, individual actors play a critical role in the ecosystem.

This contributes to economic renewal, where the new replaces what was previously used, thus leading to economic growth. The literature highlights differences between *push- and pull factors* in entrepreneurship (Audretsch & Thurik, 2000; Valliere & Peterson, 2009). Theoretic have explained the economic development rates as partly a business from deviating business rates from an equilibrium. A balance of supply and demand in a nation and an economy driven by both technology-push and market-pull. On the other hand, differences arise in different types of companies, especially when it comes to different nations. The division of entrepreneurship from an economic perspective follows supply and demand. Whatever range reflects individuals' relevant preferences, skills and resources. The supply of technology creates a push effect on the demand. On the other hand, demand relates to the market-pull and demand for opportunities to create and connect innovation and to start a business. Nonetheless, an equilibrium in considering the dynamics of innovative entrepreneurship.



2.3 NATIONAL SYSTEM OF INNOVATION

Economic performance has previously been explained by innovation-driven and localized economic factors and processes. Schumpeter (1942) argues that innovation is a component of the actual process when new technologies are developed. The process as Schumpeter (1942) discuss is a three-step breakdown;

Invention → Innovation → Adoption.

Firstly, the process of *invention* begins, which includes general ideas and R&D, which can then be commercialized in the next step that is *innovation*. Once it has been processed at the innovation level, it is taken to the *adoption* stage and Schumpeter (1942) claims that the new technology is then ready to reach the market.

In innovation systems, knowledge sources reflect both domestic and foreign components. A National Innovation System based on knowledge is an important resource in the economy as well as the knowledge produced and accumulated through interactive and cumulate process of innovation (Lundvall, 1992; Freeman, 1995). The structure focuses institutional and industrially interaction and knowledge-building rather than the individual level, because it is the structure that contributes to national innovation and productivity. The concept became popular in the 1990's with the publication of an international research project (Nelson, 1993), attention to interactions in innovations system (Lundvall, 1992), the study of Japanese innovation (Freeman, 1988). Not to mention, this kind of process is only effective in the right environment and in a nation's innovation system.

Gogodze (2016) claims that a national innovation system (NIS), acts for the nation and is crucial for the individual country's innovation and capacity. NIS consists of different parts;

- *Knowledge generation subsystems;* the element that processes knowledge generation from example universities and R&D centres.
- *Exploitation subsystems;* consists mainly of firms, tendencies of clustering. The more actors that take part in exploitation subsystems, the greater the cluster. A network where companies can learn from each other.
- *Supporting subsystems;* the government's role is discussed as support and infrastructure, formal and informal institutions.

The system acts such as actors cooperate with each other (Gogodze, 2016). Comprehensive resources, such as human, financial, infrastructural, and institutional resources, within the borders of a nation are included in the NIS. When these resources interact, innovation is generated as well as some form of dissemination of knowledge that can be summarized as an intangible asset. As a component, NIS can therefore contribute to value-creating effects and the country's economic growth. Thus, Gogodze (2016) claims that NIS is defined as a socio-economic system. This kind of socialist systems in technical development followed step by step, from research into development and then innovation. Previous research has established that it reminded of a hierarchical method and the relationship between the players were relatively weak and commercialization was absent. Furthermore, the foreign interactions were very sporadic when all links with foreign sources of knowledge were controlled by the state. Acs et al. (2017) announce that the gap between knowledge dissemination and technical development was influenced by these weak foreign links as well as all reproduction done by foreign research.

Acs et al. (2017) argues that in a global world it is about the possibility of using resources elsewhere, especially when only national systems are somewhat limited in terms of innovation methods. Development issues were based on state-defined priorities, and it was also the domestic governmental organizations that decided on domestic industrial policy and thus the infrastructure. Eliasson (2000) claims that it is the infrastructure that is required to promote new ideas in business clusters and independent skills blocks. Block of institutional actors who have a viable role in the commercialization of ideas, as the sources of knowledge mainly comes from domestic elements such as R&D centres, universities and science parks. Marshallian externalities encourage this and have been a key to shaping industrial policy in OECD economies (Warwick, 2013).

Today, a nation's level of innovation is built primarily on the performance of the internal actors and how they interact with each other. As Gogodze (2016) express that NIS are based on interactions between different actors active in innovation, and the connections that arise are key to improving the technical performance. The interactions that arise are primarily research, patenting and exchange of personnel and equipment. Development and improvement is based on a complex set of actors and the knowledge they possess. Since NIS is multidimensional and complex of nature, instruments need to be used to measure a country's ability to achieve innovative processes, products, and activities.

2.4 CONCEPTUAL FRAMEWORK: INTEGRATING THEORIES

Today, both academics and politicians talk about the importance of new businesses and the development of entrepreneurship. Entrepreneurs are effective in the right environment and play a role in today's economy and to achieve entrepreneurship. The entrepreneurial framework environments are of great importance because they regulate, firstly, *who chooses to become an entrepreneur*. An entrepreneur is no specific person, but can be anyone and their common link is the ability to get new ideas to the market. Whether an entrepreneur succeeds does not have to do with what tools it has, rather in what environment, therefore secondly, *to what extent can the new businesses meet their growth potential.*

The National Innovation System includes human, financial, infrastructure and institutional resources within the borders of a nation. Components of Entrepreneurial Ecosystems are linked to NIS, especially those actors that are included in both systems. Gogodze (2016) claims that companies, universities and other formal and informal institutions cooperate within the National Innovation System while Brown and Mason (2017) express that Entrepreneurial Ecosystem is based on education, programs given by the government, as well as R&D transfer, infrastructure, internal market dynamics and entry regulation, physical infrastructure, in addition to cultural and social norms.

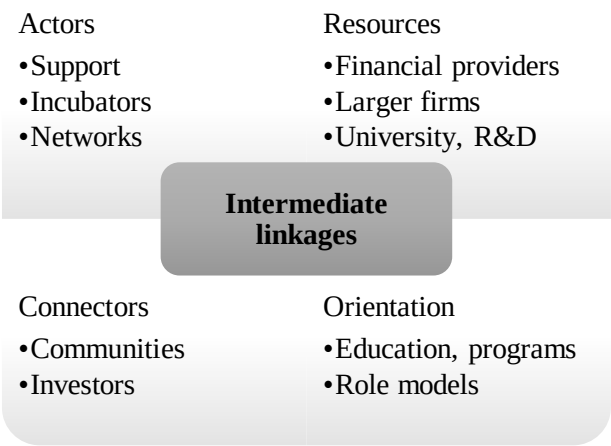


FIGURE 3 INTERMEDIATE LINKAGES BETWEEN NATIONAL INNOVATION SYSTEM AND ENTREPRENEURIAL ECOSYSTEM.

When these resources interact, innovation is created as well as some form of knowledge dissemination that can be summarized as an intangible asset. As a part, National Innovation System can therefore contribute the social and environmental benefits of Entrepreneurial Ecosystems. Collaboration increase opportunities and, on the other hand, it is the potential entrepreneur who generates commercial success as a part of the National Innovation System. All actors in the branch becomes mutually supporting and illustrate new ways of competing and finding new opportunities. Below is the conceptual framework that identifies the link between Entrepreneurial Ecosystems and National Innovation System. The study will follow the framework and aim to identify factors within a nation that encourages, and possibly impedes, entrepreneurship.

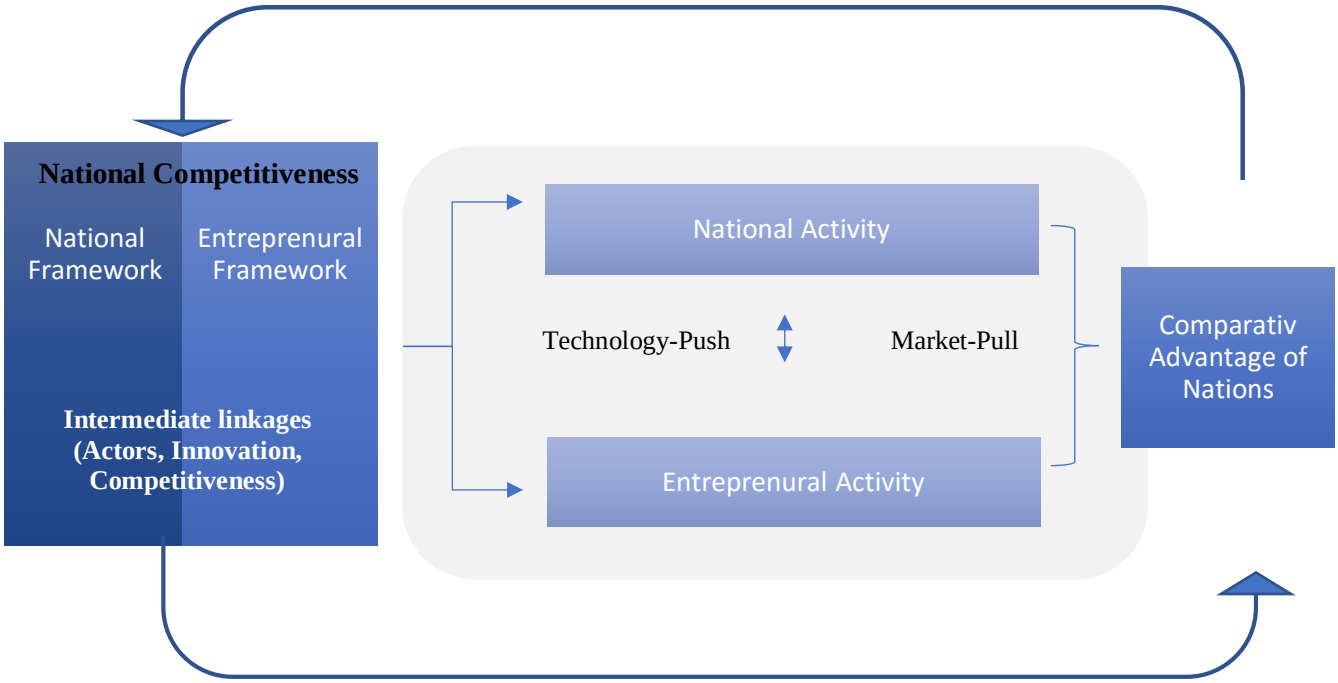


FIGURE 4 CONCEPTUAL FRAMEWORK: LINKING ENTREPRENEURIAL ECOSYSTEM TO NATIONAL INNOVATION SYSTEM

3. METHODOLOGY

The following sections aim to briefly clarify and expose the methodological approach underlying the essay. The focus is on finding methods to answer the question; How may National Innovation Systems support entrepreneurship through different mechanisms? To fully understand the results and findings of this research, it is also important to clarify what the methods and processes behind the results are, as well as the reasoning for choosing these particular methods.

3.1 RESEARCH APPROACH

After examining existing literature, the following chapter presents how the compound research question will be studied, that is, the basis of the dissertation. The research question was influenced by previous contributions within the field of entrepreneurship and innovation, which therefore ought to make the relation with previous research important. The study follows a deductive reasoning, which means that the study's research question was derived from existing research and theories, and subsequently tested.

The aim of this research, requires literature that defines the theoretical framework contained here; Entrepreneurial Ecosystem, Entrepreneurship and National Innovation system. The process was initiated by the examination of existing literature, followed by the construction of the research question which is based on the existing theory. Further research was driven by the research question and, depending on the results of the collected data, got answered in the conclusion. Moreover, a deductive approach is often used when explaining causal relationships between variables. However, this study does not aim to induce new theories to the background of the fact that there are already many academic studies and theories that deal with both National Innovation System and Entrepreneurial Ecosystem. Consequently, this study aims at strengthening or challenging existing theories about national innovations impact on entrepreneurship.

The theory of deductive research is often associated with a quantitative research method, and this also applies to this research. Quantitative research emphasizes quantification in data collection and analysis, which ultimately comes down to numbers and statistics. Through a quantitative study, statistical generalizations of the results could be implemented.

Criticism towards the approach is that, when generalizing statistic, it becomes difficult to distinguish people and gives a static picture of social life. On the other hand, this study aims to responding to enforcement mechanisms that could lead to variations in the contexts of national successful entrepreneurship and it was not necessary to create application in everyday life for this research.

The empirical framework includes the quantitative data required to respond to the purpose of the study which meets the requirements for this thesis. The generalization of knowledge is thus desirable since a small number of studies have raised the potential connection. The research design that is explained represents step 1 in figure 5, in the next section, step 2, processing of data, will be explained.

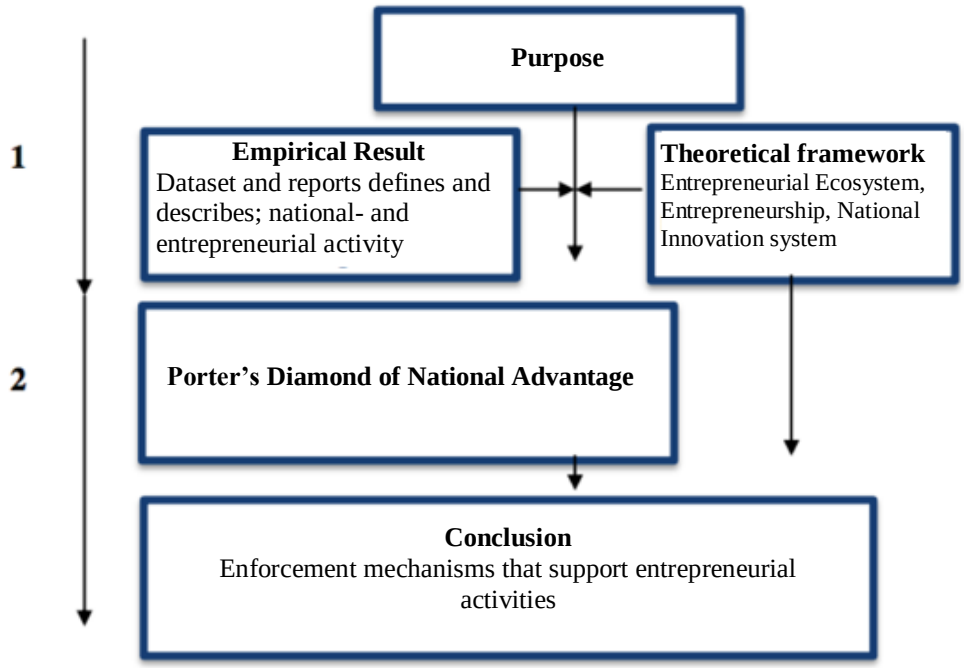


FIGURE 5 RESEARCH DESIGN

3.2 DATA COLLECTION INSTRUMENT

Secondary dataset underlying the data source, giving the researcher the opportunity to rethink data already collected by others. Given that the researcher is not responsible for collecting the material, it also gives more time to process and add resources to the analysis. The primary data source is the data set taken from the Global Entrepreneurship Monitor (GEM) (GEM, 2017), The Global Research Report Institute (Acs et al. 2017) and the Global Innovation Report (Dutta, Lanvin & Wunsch-Vincent, 2016). The The Global Research Report Institute provides the study with the Global Entrepreneurship Index (GEI) and related variables. The Global Innovation Report provides the study with the Global Innovation Index (GII). Data and statistic are collected from GII (2016) and GEI (2017).

Dataset provided information about national activities on entrepreneurial activities, and reports are used for interpretations. An additional benefit is a better understanding of the research problem by reviewing background information, which also captures the research area and increases the ability to assess the relationship between the established variables that were designed based on the presented literature review. Since the study aims to describe a relationship between two concepts in a specific context that have been investigated to a large extent previously have enough secondary data to answer the research questions.

3.2.1 VARIABLES ENTREPRENEURIAL ECOSYSTEM AND NATIONAL INNOVATION SYSTEM

All the charts, figures and data presented in this section are taken from the report given by Acs et al. (2017); GEM (2017); Dutta, S., Lanvin, B. & Wunsch-Vincent, S. (2016) and the dataset given by GII, (2016); GEI (2017). The study is limited to Europe only and thus the data will reflect the geographic area that the study represents. On the other hand, comparison with the OECD will be done to show a generalized picture of overall performance, as well as to make a breakdown of strengths and weaknesses that nations faces. The choice of comparison with the OECD is to compare with, within the subject, high-performing nations and follows the pursuit of a context of constant improvement of the economy. Focuses on innovation mechanisms that support entrepreneurship, metrics and variables related to this issue.

The leading research organization Global Entrepreneurship and Development Institute (GEDI Institute) promotes knowledge of the relationship between entrepreneurship, economic development and prosperity. The report is done by Acs et al. (2017) and the main tool in the report is the Global Entrepreneurship Index (GEI) that measures the quality and dynamics of business-economic ecosystems. The GEI dataset with focus on a national level is used in this study (GEI, 2017). Using the Global Entrepreneurship Index increases the possibility of comparing variables between nations, which promotes the development of global prosperity. The GEDI index is based on 14 pillar of an Entrepreneurial Ecosystem, description of the variables can be found in appendix 1, and table 2 shows how these pillars are developed. GEDI Index Pillars are used to establish the effect on entrepreneurship. The division between the National Framework and the Entrepreneurial Framework (table 3) is done from the composition and description of the pillar (appendix 1).

	Sub-indexes	Pillars	Variables (ind./inst.)
GLOBAL ENTREPRENEURSHIP INDEX	ATTITUDES SUB-INDEX	OPPORTUNITY PERCEPTION	*OPPORTUNITY RECOGNITION*
			FREEDOM (ECONOMIC FREEDOM *PROPERTY RIGHTS)
		STARTUP SKILLS	*SKILL PERCEPTION*
			EDUCATION (TERTIARY EDUCATION*QUALITY OF EDUCATION)
		RISK ACCEPTANCE	*RISK PERCEPTION*
			COUNTRY RISK
		NETWORKING	*KNOW ENTREPRENEURS*
			AGGLOMERATION (URBANIZATION*INFRASTUCTURE)
		CULTURAL SUPPORT	*CAREER STATUS*
			CORRUPTION
	ABILITIES SUB-INDEX	OPPORTUNITY STARTUP	*OPPORTUNITY MOTIVATION*
			GOVERNANCE (TAXATION*GOOD GOVERNANCE)
		TECHNOLOGY ABSORPTION	*TECHNOLOGY LEVEL*
			TECHNOLOGY ABSORPTION
		HUMAN CAPITAL	*EDUCATIONAL LEVEL*
			LABOR MARKET (STAFF TRAINING*LABOUR FREEDOM)
		COMPETITION	*COMPETITORS*
			COMPETETIVNESS (MARKET DOMINANCE*REGULATION)
	ASPIRATION SUB-INDEX	PRODUCT INNOVATION	*NEW PRODUCT*
			TECH TRANSFER
		PROCESS INNOVATION	*NEW TECHLOLOGY*
			SCIENCE (GERD*(AVERAGEQUALITY OF SCIENTIFICAL INSTITUTIONS +AVAILABILITY OF SCIENTISTS AND ENGENEERS))
		HIGH GROWTH	*GAZELLE*
			FINANCE AND STRATEGY (VENTURE CAPITAL*BUSINESS SOPHISTICATION)
		INTERNATIONALIZATION	*EXPORT*
			ECONOMIC COMPLEXITY
		RISK CAPITAL	*INFORMAL INVESTMENT*
			DEPTH OF CAPITAL MARKET

TABELL 2 THE STRUCTURE OF THE GEDI INDEX PILLARS (ACS ET AL. 2017; P.1).

The literature on Entrepreneurial Ecosystems has a strong link with systematic innovation systems, a term that enhances knowledge generation and transfer. Global Innovation Index (GII) was therefore used to analyse the importance of the NIS for the support of entrepreneurship. Dutta, Lanvin and Wunsch-Vincent, (2016) defines that the index is a measure that deals with the multidimensional aspects of innovation (GII, 2016). In table 3, *Identification of the pillar's character* provides a summary of the variables used in the study, identified to have a high variability and thus useful for the research purpose.

	National Framework	Entrepreneurial Framework
1. Opportunity Perception		X
2. Start-up Skills		X
3. Risk Acceptance		X
4. Networking	X	
5. Cultural Support	X	
6. Opportunity Start-up	X	
7. Technology Absorption	X	
8.Human Capital	X	
9. Competition	X	
10. Product Innovation	X	
11. Process Innovation	X	
12. High Growth		X
13. Internationalization	X	
14. Risk Capital	X	
GEI		X
GII	X	

TABLE 3 IDENTIFICATION OF THE PILLAR'S CHARACTER

3.3 DATA ANALYSIS METHOD

Entrepreneur ecosystems have been studied earlier and in the 1990s there was an abundance of studies aimed at measuring, among other things, input-output analysis. A quote from Vogel (2013, p. 9) "*If we do not measure the effectiveness of the various components of an ecosystem and ecosystems as a whole, we will not be able to improve existing programs and introduce new and complementary resources".* Without focusing on different actors, the analysis focused on the support that goes from National Innovation Systems, through different mechanisms, to Entrepreneurship.

This study requests a descriptive research design since the research aims to establish substantial relationships, a correlation between the variables of interest to deliver an accurate description of the situation. The descriptive research design does not seek to derive explanations of a problem, but rather define, describe and locate the national constituents that support entrepreneurship. This research was designed to explore different mechanisms that lead to variations in the contexts of national successful entrepreneurship.

There is no model that creates the correct solution, but on the other hand, the linear regression is better suited to display linear correlation. Therefore, a linear correlation analysis was applied to identify the relationship between variables, this responded to which national activities that have an impact on entrepreneurial activities. The relationship between the variables was tested separately and then p value (<0.05) indicates a meaningfulness to the model. When correlation is found with more than one value, the variable used is the variable that does not correlate with any of the other variables. Followed by, a scatter plot that described the correlations between the variables in different nations. This diagram answers for both linear and nonlinear relationships between two variables. Regression line was also applied to see it from a more general perspective and the linear equation showed the relationship between variables.

Based on this data analysis, a development of the conceptual framework follows, which is first constructed at the theory section, and this developed part focuses on the central part of the framework; national- and entrepreneurial activities. According to the Porter (1990), it is the environment that enables national success and the aim of the study is to find the mechanisms that support entrepreneurship. To enable this analysis, Porter's National Diamond will be used (figure 6). Localization of national supportive activities was undertaken to investigate how it can lead to variations in the context of the successful entrepreneurship of the European nations'. This model worked as an effective tool to use when describing the contribution and finding the central connections that link together the following; firm strategy, demand terms, related and supportive industries, factor conditions, chance and government.

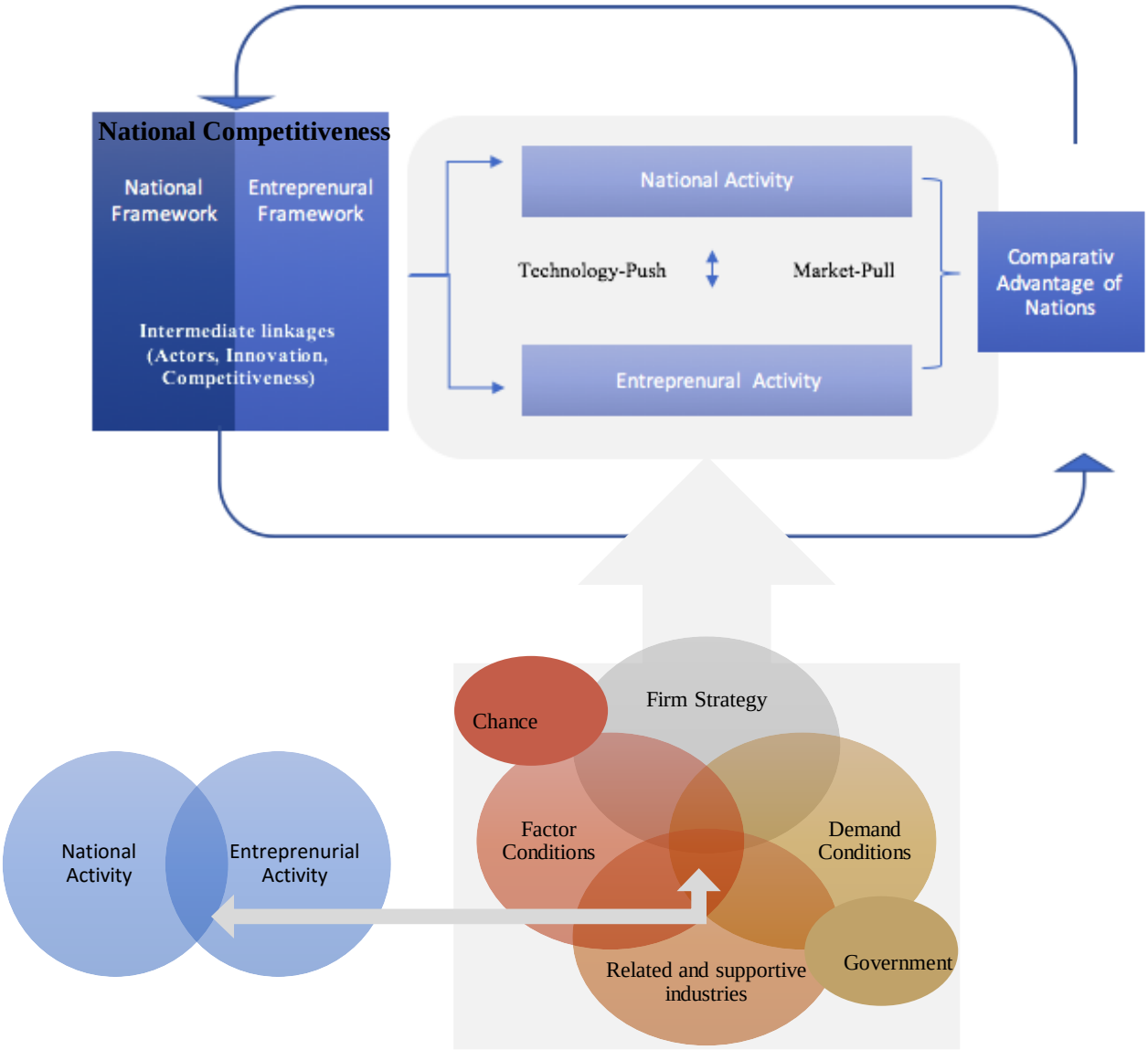


FIGURE 6 PORTER'S DIAMOND NATIONAL ADVANTAGE AS ANALYSIS METHOD

3.4 QUALITY CRITERIA FOR MEASUREMENT

During this research, consideration has been given to quality measures; validity and reliability. Validity means that the questions are set in such a way that they really measure what is meant to be measured. In this quantitative study, it means that the method of choice is intended to achieve the purpose of the study, with no personal values playing into the outcome. Consideration to the reliability means that the intended measurements are measured correctly, that is, how it is measured. Being able to measure the perception is an important contribution in the study, to enable that the results can be repeated. Reliability can be guaranteed since the study is based on literature and existing data.

3.4.1 LIMITATIONS

The dataset obtained from The Global Entrepreneurship Report does not include all the nations of the world, and in the study of Europe, Malta and Andorra are excluded. This has been taken into consideration but accepted in the light of the fact that the focus has instead been on other countries. However, attention should be drawn to the fact that they are missing in the average measure, that is, both the linear function of the figure and when it is used to show Europe's average location for the different variables.

The average of Europe is linked to the OECD to lift Europe's performance in relation to the countries classified as the world's greatest economies. Note that New Zealand is missing in the average of the OECD.

4. EMPIRICAL RESULT

Initially, a presentation of Entrepreneurial activities and focus on the development of entrepreneurial economies in Europe. Furthermore, a more detailed approach to entrepreneurship and its variables follows. Next section, National activity and test of the variables and charts presents the nation's performance, to ensure the national innovation system. All charts and data presented in this section are taken from the report from Acs et al. (2017), Dutta, Lanvin and Wunsch-Vincent, (2016) *and GEM (2017) and data sets from GEI (2017) and GII (2016).*

4.1 ENTREPRENEURIAL ACTIVITY

In Europe, only 58% of the whole population consider entrepreneurship a good career opportunity, but it differs depending on the nation. The Global Report divides the nations by phases and types of entrepreneurial economies. The division is between the different driving forces; Factor-, Efficiency- and Innovation-driven.

- *Factor-driven economy* is the group with the highest level of TEA (Total Early-stage Entrepreneurial Activity) and appears to decrease in the context of a nation's economic development. Established business ownership is highest in the factor-driven group of economies. Europe is the geographical region reporting the lowest level of TEA.
- *Efficiency-driven economy* is the group where two thirds of the population considers it a good career choice to start a business. This is a group who believes they possess the knowledge required while about one third of the population are afraid of failing.
- *Innovation-driven economy* is the group of entrepreneurs that are significantly more innovative. TEA is high as well as the level of innovation. In this category of economy there are eight established business owners for every ten in the start-up phase.

Total Early-stage Entrepreneurial activity (TEA) level, measurements for people who are working age and activity participate in business start-ups. Entrepreneurial Employment Activities (EEA) include the actors starting a new project in addition to their existing employment. This is something many European economies contribute through different risks and opportunities. Europe has the second highest level of EEA in the world (4%), North America has the highest (6,5%).

The Global Entrepreneurship Report has categorized the entrepreneurial economies of Europe by development level, which is presented in table 4, note that, due to limitation in the dataset, all countries are not included. Further, The Global Entrepreneurship Report highlights that EEA is high in Europe but the rate differs depending on nation. Europe holds low levels of business in relation to the world at large, but the EEA is high. In most North and West European economies, high levels of EEA and TEA, maintain a higher level of entrepreneurial. With the eastern and Baltic economies, the higher the proportion of corporate formations and the EEA. The lowest level of EEA has the southern Europe economies, and there are low levels of avenue leadership formations.

The EEA is therefore not explained as a widespread phenomenon, but above all, the EEA is likely to be of higher quality in terms of growth potential. Europe thus maintains a relatively high level of competitiveness despite low rates of start-ups. The countries rate of TEA and EEA is presented in table 5.

FACTOR-DRIVEN	EFFICIENCY-DRIVEN	INNOVATION-DRIVEN
RUSSIAN FEDERATION	BULGARIA	AUSTRIA
	CROATIA	CYPRUS
	HUNGARY	ESTONIA
	LATVIA	FINLAND
	MACEDONIA	GERMANY
	POLAND	GREECE
	SLOVAKIA	IRELAND
		ITALY
		LUXEMBURG
		NETHERLANDS
		PORTUGAL
		SLOVENIA
		SPAIN
		SWEDEN
		UNITED KINGDOM

TABLE 4 ECONOMIC DEVELOPMENT LEVEL (SOURCE: GEM, 2016).

	COUNTRY	TEA	EEA
FACTOR-DRIVEN	RUSSIA	6,3	0,7
EFFICIENCY-DRIVEN	BULGARIA	4,8	0,9
	CROATIA	8,4	5,3
	HUNGARY	7,9	3
	LATVIA	14,2	4,5
	MACEDONIA	6,5	1,4
	POLAND	10,7	5,2
	SLOVAKIA	9,5	2,2
INNOVATION-DRIVEN	AUSTRIA	9,6	7,3
	CYPRUS	12	5,6
	ESTONIA	16,2	6,3
	FINLAND	6,7	5,6
	GERMANY	4,6	5,1
	GREECE	5,7	1,4
	IRELAND	10,9	6,2
	ITALY	4,4	2,1
	LUXEMBURG	9,2	7,2
	NETHERLANDS	11	7,6
	PORTUGAL	8,2	2,4
	SLOVENIA	8	4,7
	SPAIN	5,2	2,7
	SWEDEN	7,6	6,1
	UNITED KINGDOM	8,8	7

TABLE 5 ECONOMIES PERFORMANCE - TEA AND EEA (SOURCE: GEM, 2016).

In the Global Entrepreneurship Report, evidence demonstrates that in the entire geographic region of Europe, about a quarter of entrepreneurship takes place in the wholesale/retail sector. There is a significantly higher representation (46%) in engineering, finance and professional services. The division of entrepreneurial economies represents the level of entrepreneurship in each nation. The next figure shows the identification of the variables phases/types of entrepreneurial economies (figure 7). Presented as the group average of the nations development level represents the division of; factor-driven, efficiency-driven and innovation-driven economy.

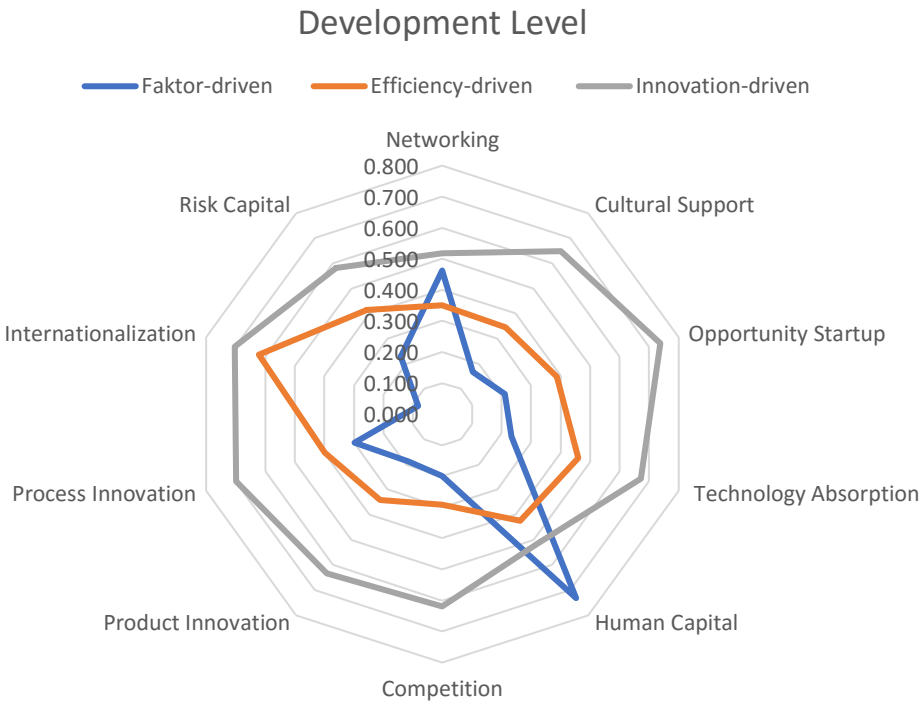


FIGURE 7 LOCATING THE NATIONAL CONSTITUENTS

Based on figure 7, the different national constituents based on development of the different levels of entrepreneurial economies driving forces are identified. The figure provides information about the highest and lowest level of the different variables, divided into each economy based on driving forces. The spread distinguishes the pillars based on how the economy is driven. The highest value pillar's in each development level are identified and categorization of the variables is presented in table 6. The categorization show the strongest variables in each economy based on the driving force. Meanwhile, the strongest, does not mean that they do not have high levels of the other variables, but they are the most notable ones.

	Factor-driven	Efficiency- driven	Innovation- driven
Networking	X		
Cultural Support			X
Opportunity Start-up			X
Technology Absorption		X	X
Human Capital	X	X	
Competition			X
Product Innovation			X
Process Innovation	X	X	X
Internationalization		X	
Risk Capital		X	

TABLE 6 CATEGORIZATION OF THE VARIABLES BASED ON THE DRIVING FORCES

Based on the identification of the pillar's character (table 3), the Entrepreneurial activity that should be supported is; risk acceptance, high growth, start-up skills and opportunity perception. Through a linear regression where entrepreneurial variables are dependent and nationally variables independent (appendix 2), strong correlation is shown as follows;

- *Risk acceptance – Opportunity start-up*
- *High growth – Technology absorption*
- *Start-up skills – Process innovation*
- *Opportunity perception – Culture support*

The linear regression locates the national mechanism that support entrepreneurship. Further, from the composition and description of the pillar (appendix 1) and the division between the National Framework and the Entrepreneurial Framework (table 3), the variables in table 7 are sorted to ensure their contribution. The contribution that the linear regression highlights. The division is made between *National activity* which supporting *Entrepreneurial activity.*

	National activity	***Entrepreneurial activity***
Factor-driven	Human Capital	
	Networking	
	Process Innovation	
Efficiency-driven	Technology Absorption	High growth
	Human Capital	
	Process Innovation	Start-up skills
	Internationalisation	
	Risk Capital	
Innovation-driven	Cultural Support	Opportunity perception
	Opportunity Start-up	Risk acceptance
	Technology absorption	High growth
	Competition	
	Product innovation	
	Process innovation	Start-up skills

TABLE 7 IDENTIFICATION OF THE PILLAR'S CONTRIBUTION

4.2 NATIONAL ACTIVITY - TEST OF THE PILLAR'S CONTRIBUTION

Test of the pillar's contribution to investigation of enforcement mechanisms that could lead to variations in the contexts of national successful entrepreneurship. The nations fluctuate above and below the line. In the grey box, the innovation-driven economies are found, in the orange box, the efficiency-driven economies, and in the blue box, the factor-driven economies. Box excludes extreme values, these are nations that do not comply with the norm within the categorization of economies based on development level.

4.2.1 RISK ACCEPTANCE AND OPPORTUNITY START-UP

$$Y = -0{,}07 + 0{,}92 * x$$

Figure 10 shows the link between Risk acceptance and the amount of opportunity start-up. In this way, we can measure the opportunity start-up of a nation and how it affects the ability to achieve risk acceptance. The diagram shows a visual comparison between two variables and the line shows the relationship. The linear function shows an average, when the ability to absorb start-up culminates with 1, risk acceptance increases by 0,92. The line cuts risk accept at -0,07 and therefore requires a certain amount of opportunity start-up before an actor's risk acceptance begins.

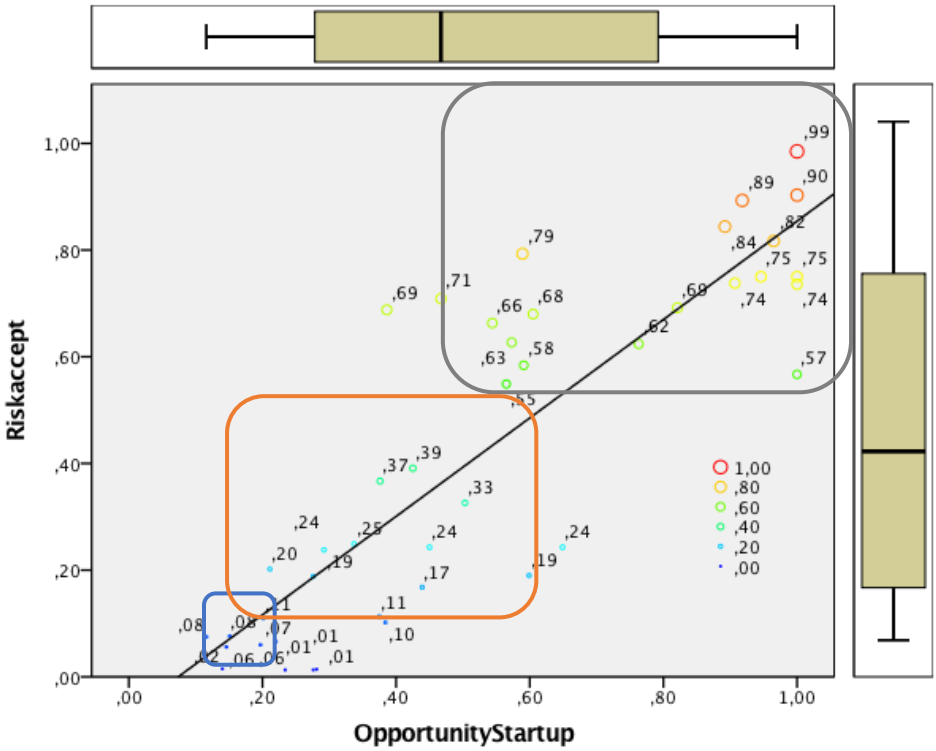


FIGURE 8 RISK ACCEPTANCE AND OPPORTUNITY START-UP

4.2.2 HIGH GROWTH AND TECHNOLOGY ABSORPTION

Y= 0,26+0,38*x

Figure 11 shows the link between High growth and the amount of Technology absorption. In this way, we can measure the technological absorption of a nation and how it affects the ability to achieve high growth. The diagram shows a visual comparison between two variables and the line shows the relationship. The linear function shows an average, when the ability to absorb technology culminates with 1, high growth increases by 0.38. The line cuts high growth at 0.26 and hence increases high growth even before the absorption of technology begins.

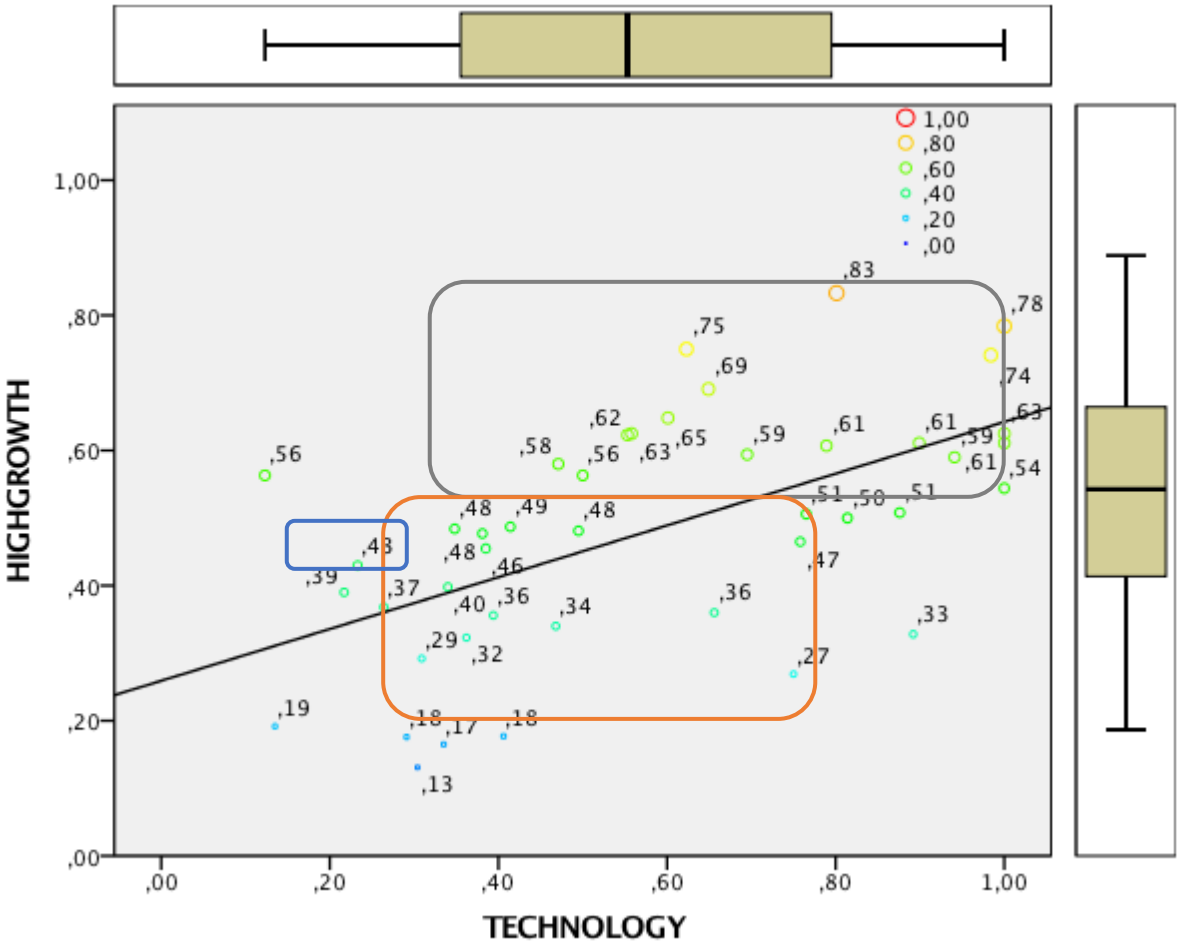


FIGURE 9 HIGH GROWTH AND TECHNOLOGY ABSORPTION

4.2.3 START-UP SKILLS – PROCESS INNOVATION

*Y= 0,3+0,47*x*

Figure 9 shows the link between Start-up skills and the amount of Process innovation. In this way, we can measure the process innovation of a nation and how it affects start-up skills. The spread diagram shows a visual comparison between the two variables and the line shows the relationship. The linear function shows an average, when the ability to absorb process innovation culminates with 1, start-up skills increases with 0.47. The line cuts start-up skills at 0.3 and hence increases start up skills even before the process innovation begins.

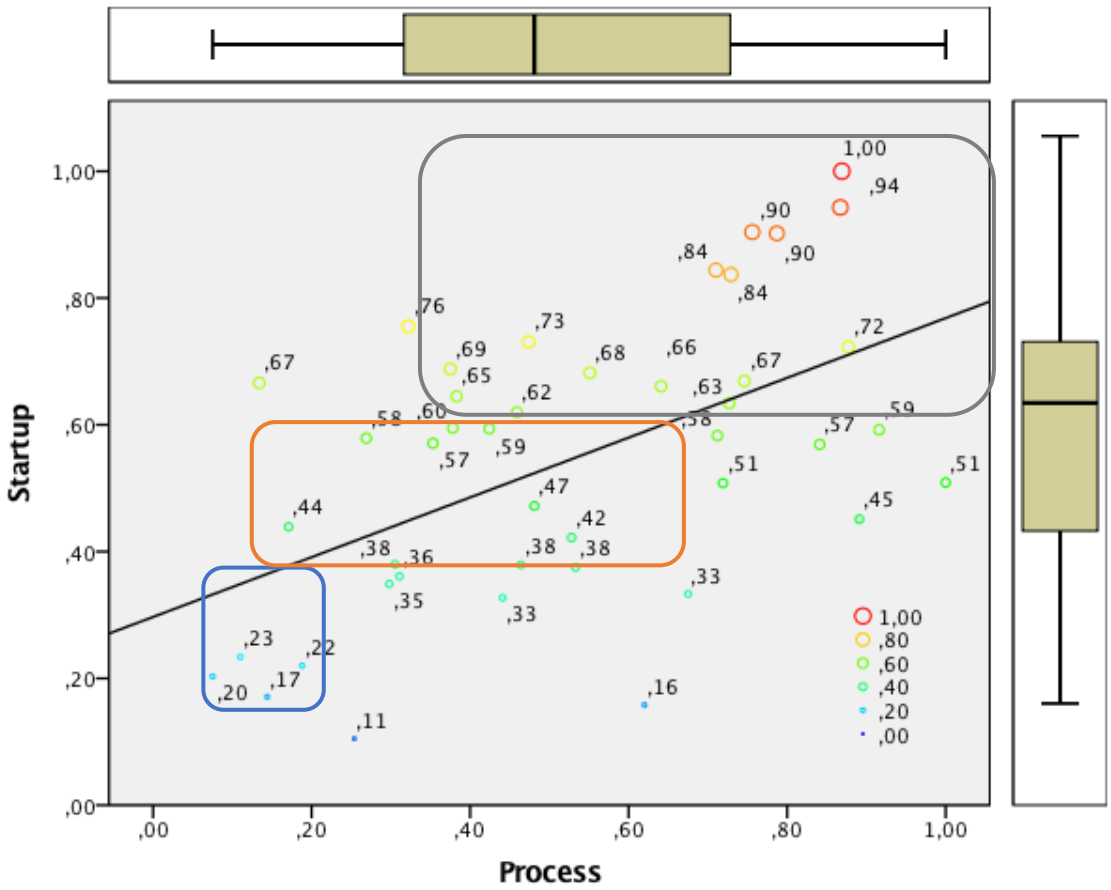


FIGURE 10 START-UP SKILLS AND PROCESS INNOVATION

4.2.4 OPPORTUNITY PERCEPTION AND CULTURAL SUPPORT

*Y = -0,2+1,02*x*

Figure 8 shows the link between Opportunity perception and the amount of Culture support. In this way, we can measure the culture support of a nation and how it affects the ability to achieve opportunity perception. The diagram shows a visual comparison between two variables and the line shows the relationship. The linear function shows an average, when the ability to absorb cultural support culminates with 1, opportunity perception increases by 1,02. The line cuts opportunity perception at -0,2 and therefore requires a certain amount of cultural support before an actor's opportunity perception begins.

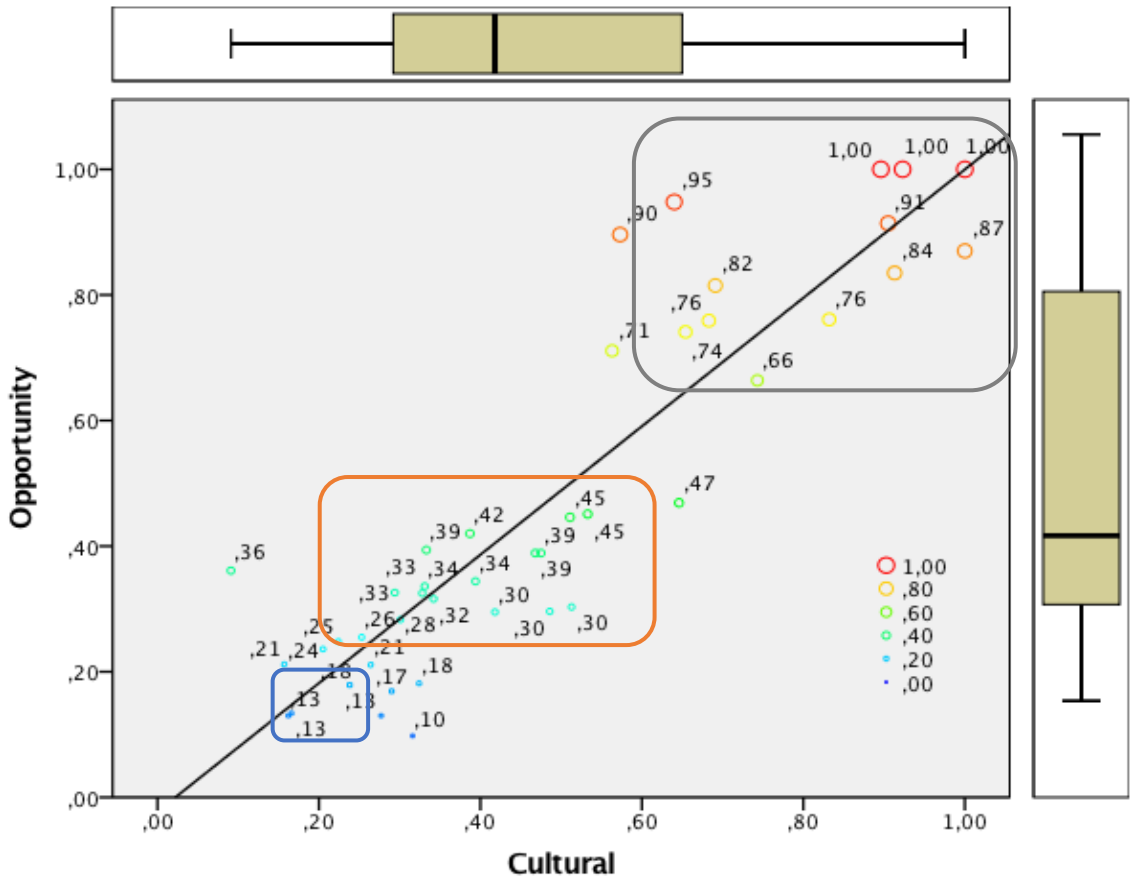


FIGURE 11 OPPORTUNITY PERCEPTION AND CULTURAL SUPPORT

4.3 ENTREPRENEURSHIP AND INNOVATION

Global Entrepreneurship Index and Global Innovation Index $Y = -29{,}12 + 1{,}64 * x$

Figure 12 shows the link between the Global Entrepreneurship Index (GEI) and the value of the Global Innovation Index (GII). In this way, we can measure the level of GII in a nation and how it affects the ability to achieve GEI. The diagram shows a visual comparison between two variables and the line shows the relationship. The linear function shows an average, when the ability to absorb GII culminates with 1, opportunity perception increases by 1.64. The line intersects GEI at -29.12 and therefore requires a certain amount of GII before an actor's GEI begins.

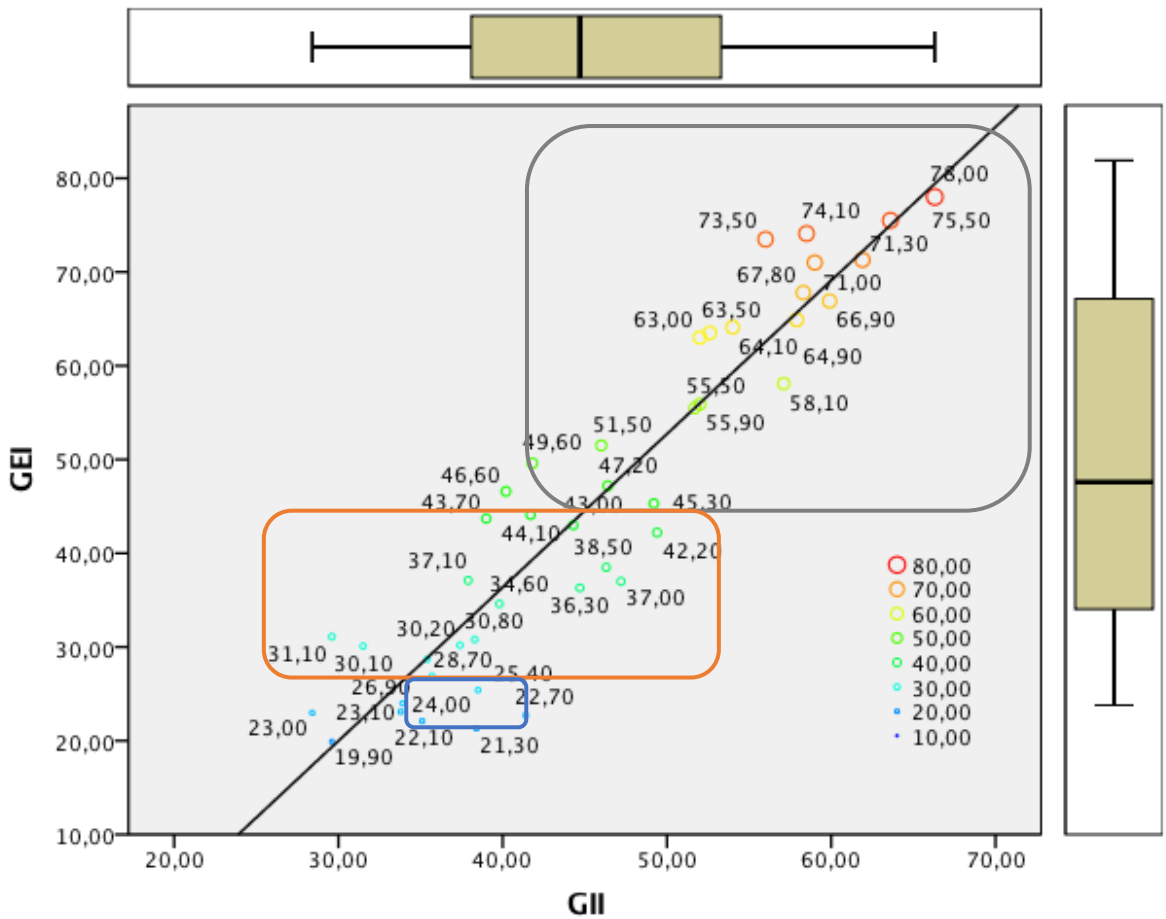


FIGURE 12 GEI AND GII

Further, figure 13 provides the Global Entrepreneurship Index and Global Innovation Index for each country. What stands out in the figure is that the countries on the left part have a higher level of entrepreneurship that innovation. The countries on the middle part has a lower level of both and above all an increased level of innovation in relation to entrepreneurship. Finally, the countries on the right part, the levels are the lower and give a clear indication that innovation is higher in relation to entrepreneurship.

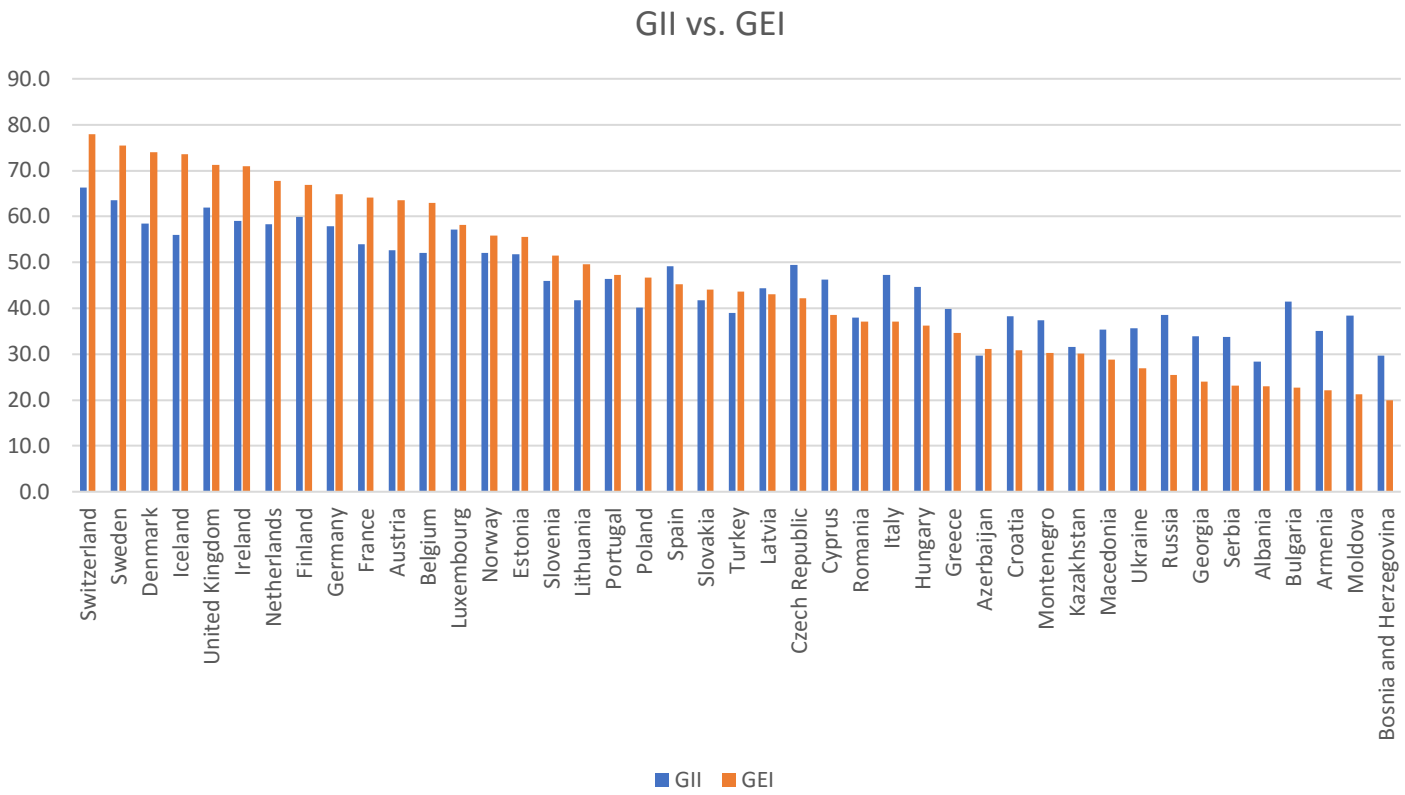


FIGURE 13 ENTREPRENEURSHIP AND INNOVATION

4.3.1 GENERAL LINKAGES

Based on the report given by Acs et al. (2017), figure 14 presents how Europe in relation to the OECD stands in the various pillars. Data show that the average of countries in Europe has a relatively even level of performance in all categories. The strongest ones are internalization, opportunity start-up, technology absorption and process innovation. The weakest ones are networking, cultural support, competition and product innovation.

In the same figure, data is found for the same variables categorized for the OECD. The line representing OECD shows higher values and thus stronger performance. The strongest ones are internalization, opportunity start-up, technology absorption, product innovation and process innovation. The weakest ones are networking, cultural support, human capital and competition.

- Common strength; Internalization, opportunity start-up, technology absorption and process innovation.
- Common weakness; Cultural support and competition.

The results in this chapter indicate which mechanisms that can lead to variations associated with entrepreneurial- and national- activities. The next chapter, therefore, moves on to discuss how may National Innovation Systems support entrepreneurship through different mechanisms.

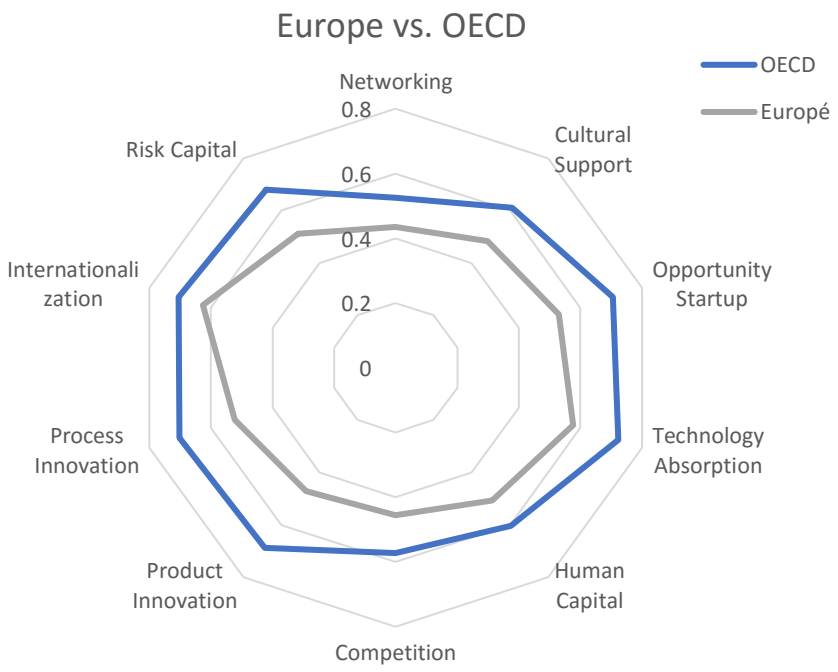


FIGURE 14 LOCATING THE NATIONAL CONSTITUENTS EUROPE VS. OECD

5. DISCUSSION OF RESULT AND CONCLUSION

The aim of this study is to define, describe and locate the national elements that support entrepreneurship. To achieve this goal, the following chapter includes an investigation of enforcement mechanisms that can lead to variations associated with nationally successful entrepreneurship. Discussion follows the analysis model (figure 6), presented in the method.

5.1 PORTERS DIAMOND OF NATIONAL ADVANTAGE

According to Brown and Mason (2017), whether entrepreneurship contributes to economic development relate to the environment and the completed entrepreneurial activities. More specifically, linking National Innovation Systems to entrepreneurship can also mean linking the individual level to the company and the macro level, regardless of economic driving forces, innovation-, efficiency- or factor-driven. Several reports have reflected the customized business economics ecosystem that should promote entrepreneurship if it maintains itself as a stable foundation. In other words, comparable with the nation's policies, education, state programs, R&D transfer, infrastructure, internal market dynamics and access control, physical infrastructure as well as cultural and social norms. The type of actor and coordinator depends on the reason of which the economy has developed and the mechanisms that support entrepreneurship will be accepted or rejected based on the Porter's Diamond of National Advantage.

5.1.1 FIRM STRATEGY

In the case of divisions and living economies, entrepreneurs act as risk takers and innovators, and these results further support Schumpeter’s (1934) idea of an entrepreneur as part of the economic function. Furthermore, domestic rivalry adds to the arguments for, such as higher company level and risk acceptance, which increase the chance to succeed in entrepreneurship. Thus, according to previous research, the social elevator is difficult to validate. From an economic perspective, there are requirements for domestic rivalry, structure and conditions leading to the individuals' preferences, skills and resources. Structure and conditions represent the increasing opportunity for innovative actors to start new entrepreneurial activities, linking between opportunity start-up and risk acceptance.

A closer examination of figure 8 implies that the risk acceptance needs opportunity start-up before the risk acceptance starts to increase, then the general regression line increases by 0.92. The figure indicates a relatively even culmination that the opportunity start-up has a strong impact on risk acceptance. To enable entrepreneurial activity, it can therefore be assumed that the *Exploitation subsystems* include a firm strategy, especially when the business can contribute knowledge to other actors in the domestic network. The pattern demonstrate that higher opportunity start-up gives a higher level of risk acceptance and, in larger, clustering.

It has been proposed that entrepreneurial activities can be treated as endogenous in a sequential process, a "/ ... / practice of entrepreneurship, investment in innovation and the extent of the business aimed at technology transfer / ... /" (Baumol, 1993, p. 260). Commercialization of new technology can make companies more productive and the quality increase, as table 7 indicates, as an innovation-driven economy is summarized as entrepreneurs that create real work opportunities. This result, however, is contrary to Delmar and Wennberg (2014), as it connects this to smaller companies, thus the size announce that the economic potential is not always fully utilized. The size itself can also indicate that companies outsource certain features or make use of existing solutions instead of innovation ideas.

Thus, the relationship is tested in figure 12, and proved successful. It could identify an overview of the relationship as entrepreneurship exceeds the level of innovation which in turn, the left part of figure 13 marks the countries classified as innovation-driven economy. Yet another indication is the Entrepreneurial Employee Activity (EEA) and the Total Early-stage Entrepreneurial Activity (TEA) level in the innovation-driven economies (table 5). Because of this, it may imply that a high domestic structure and opportunity start-up that can generate higher business quality, that is, High Expected Entrepreneurship Activity (HEA)/gazelles'-companies, which could develop nations' competitiveness.

5.1.2 DEMAND CONDITION

An explanation for a nation's market is its demand for products and services (Audretsch & Thurik, 2000; Valliere & Peterson, 2009), which justifies a market-pull effect. After all, stability in high growth is because some activities create satisfaction that encourages entrepreneurial activities to continue this pattern. Different countries' economic development levels are grouped in about the same place and table 7 indicates that it is one of the strongest variables in an efficiency-driven economy.

Figure 9 provides a clear pattern of absorption of technology and the general regression line increases by 0,38. As a result, mainly Opportunity Entrepreneurship Activity (OEA) are expected to have an important role in the quality of entrepreneurship and could be found in every nation, independently to the development of the nation's economy.

Regarding the generalized pattern, the spill-over effects from technology absorption then contribute to the ecosystem, due it is only a few High Expected Entrepreneurship Activity (HEA)/gazelle-companies succeed and creates high growth. The generalized pattern of technology absorption is, according to Minniti, Bygrave and Autio (2005) essential for innovative companies with high growth potential since they need higher availability of resources and less financial resources. Of the localized economic factors and processes advocated by theory, it is the technical factor that can explain the connection between invention and adoption, that is, commercialization. Commercialization must then, according to Porter (2011), fit the nation's market and its demand for products and services. Previous research encourages entrepreneurship activities to continue this pattern, which could be enabled by *Knowledge generation subsystems*. For example, universities and R&D centres are two elements in an NIS that deals with knowledge generation.

Based on the results, it can be noted that nations combine, to a large extent, high growth potential with sophisticated business strategy and funding. The higher the growth, the more gazelle companies and the self-market-pull are what differentiate and position these actors on the market. On the other hand, in these efficiency-driven economies where the TEA is high while the EEA is low, it could probably mean that without knowledge generation subsystems it would be difficult to achieve high growth and result in decommissioning operations. This is confirmed by Porter's (1990) definition of government that acts as a catalyst that encouraging actors to challenge and move to higher performance. However, the regression line in figure 11, cuts high growth at 0.26 and hence increases high growth even before the absorption of technology begins, this proves that the theory is in line with reality. Formal and informal institutions should stimulate local cooperation and attaches importance to anti-trust regulations which is central for a country's capability to attract firms at a fixed level.

5.1.3 RELATED AND SUPPORTIVE INDUSTRIES

National competitiveness involves absence or presence of industries that according to Porter (2011) should collaborate. Theory advocates, as mentioned earlier, the socio-economic system NIS advocates for value-creating effects and the country's economic growth (Lundvall, 1992; Freeman, 1995; Gogodze, 2016; Acs et al. 2017). Observations in the empirical result in table 7 provide support for entrepreneurship to exist in nations with developed economies, both in efficiency- and innovation-driven economies. The regression line (figure 10) confirms successive increases in intensity of the process innovation, the start-up skills increases with 0.47, as well as revealing that a certain level of start-up skills already exists before process innovation begins. This highlights that governmental effort such as infrastructure is required to promote new innovative processes.

Previous studies that evaluate related and supportive industries have observed results of their operations in an *Exploitation subsystem*. The interaction that arises is based on complex sets of players whose knowledge creates development and improvement. Knowledge sources consist mainly of domestic elements; gaps can thus be reduced by mutual support in the subsystems. In this way, it would rather prove that a qualitative level presence of industries that are internationally competitive needs exploitation subsystem. According to Valliere and Peterson (2009), technical pressure could provide relevant resources that could link innovation and entrepreneurship at national level. Porter (2000) emphasizes the creation of an environment where resources can promote clusters, an environment where actors support each other. Thus, High-Expected Entrepreneurship activity (HEA) relative to the empirical result represents exogenous established companies that play a key role in ecosystems when their spill-over effects contribute to the entire cluster.

Another interesting aspect worth mentioning, figure 10 provides information about the fluctuations of nations. In these efficiency and innovation-driven economies where the TEA is high and in some nations, the EEA is also high (table 7). Stability is important and resources culminate in innovation, which may mean that absentee could inhibit start-up skills in related and supportive industries and concerning tangible and intangible assets. Then there is a generalized pattern of national weaknesses, this could be an explanation for how network and competition is crucial for an innovation-driven economy to enable initiation skills based on process innovation.

5.1.4 FACTOR CONDITION

In Europe, 58% of the working-age population considers entrepreneurship a good career choice. It is also identified that the reason for the neglect and primary lack of business profitability is consistently cited as the main reason for discontinuing operations. Meanwhile, according to Brown and Mason (2017), the more programs given by the government, infrastructure, internal market, the dynamic- and social- norms, the higher qualitative Entrepreneurial Ecosystems.

Factor conditioning includes the comprehensive resources that a nation possesses and which either promote or inhibit their market position, as well as opportunities for innovative actors to start new entreprenurial activities. A comparison of the two results in figure 14 reveals that cultural support is the weakest variable in both Europe and OECD. Meanwhile, the most interesting aspect of the linear function in figure 11 is that a certain amount of cultural support is needed before the opportunity perception begins. The most striking result to emerge from the data is that as cultural support increases with 1, the opportunity perception increase by 1.02. However, the fluctuations imply a clear division between the three economic development levels in terms of growth in opportunities perception. The bottom half of the figure shows the factor-driven economies that have high levels of TEA (table 5) and low levels of EEA. The economies that are less developed with a high level of Necessity Entrepreneurship Activity (NEA), which is based on lack of employment, thus experience low levels of opportunity perception. Meanwhile, cultural support is strongest in innovation-driven economies, where both TEA and EEA is high. Yet another link to the lack of absorption level is the opportunity perception, on the other hand, something that can be promoted by *Supporting subsystems*.

In this way, without considering corruption, the low status may hamper development. On the other hand, in the case of corruption, it may mean that the players are hampered by low economic freedom and property rights. Programs presented by the government, infrastructure, internal market, dynamic and cultural and social norms are, according to Brown and Mason (2017), key factors in a qualitative Entrepreneurial Ecosystem. Strong evidence of increasing numbers of Opportunity Entrepreneurship Activity (OEA) was found when there is a high level of cultural support. Supporting subsystems thus proves to be an important factor for economies, independent of driving forces, to expand. Activities in these economies, in turn, contribute to a cumulative knowledge bank, which, according to figure 11, even increases the opportunity perception.

5.2 LINEAGES OF THE ENTREPRENEURIAL ECOSYSTEM

Technology-push represent the supply in the nation while the Market-pull represent the demand and according previous literature, the equilibrium creates the national advantage. Put together, these results suggest that there is an association between the national prevalence levels for entrepreneurship and how many various actors, High-Expected Entrepreneurship activity (HEA), Opportunity Entrepreneurship Activity (OEA) and Necessity Entrepreneurship (NEA), that are active in economies with different driving forces, factor-, efficiency- and innovation-driven. Meanwhile, the government's role is discussed as extensive resource to create the environment needed for entrepreneurial activities.

The relationship between GEI and GII produced in figure 12 indicates that factor-driven economy involves a gap between innovation and entrepreneurship. The so-called lower level of entrepreneurial activity, as confirmed in figure 13. Another interesting aspect worth mentioning based on the result is that knowledge subsystems can ensure that factor-driven economies can be strengthened through an extensive university/R&D upgrade. In this regard, factor-driven economies include the comparative benefits of science, since the global visibility is quite limited. Increased visibility can come through a theoretical perspective through the structure of regulatory initiatives as well as support/education while global success emerges through competitive research.

Overall, these results reveal that the breakdown of economies shows how they differ in a development plan, meanwhile, the empirical result shows that the differences between their economic development are not constant when it comes to different variables. Identified data from the empirical result, connected to the intermediate linkages between National innovation system and Entrepreneurial Ecosystem, results in table 8.

	Mechanism	**National Innovation System**	**Entrepreneurial Ecosystem**
Firm strategy, Structure and Rivalry	Opportunity start-up	Exploitation subsystems	Risk acceptance
Demand condition	Technology absorption	Knowledge generation subsystems	High growth
Related and Supporting	Process innovation	Exploitation subsystems	Start-up skills
Factor condition	Culture support	Supporting subsystems	Opportunity perception

TABLE 8 IDENTIFICATION OF THE PILLAR'S SUPPORTING MECHANISMS.

5.3 CONCLUSION

This study set out to address National Innovation Systems and highlighting the mechanisms that support Entrepreneurship. The method demonstrates a contextual basis for entrepreneurial processes and how national activities promote the development of economies. Some argue that the invention of nations should be promoted by the government's increased responsibility while others argue for the work of the invisible hand. Based on this research, institutional capital is an important component for nations to succeed in innovation and the infrastructure required to promote the unique character of entrepreneurship and is responsible for encouragement and management.

Meanwhile, findings support that the Entrepreneurial Ecosystem commercialization of ideas mainly consists of domestic elements such as universities and science parks and knowledge sharing as well as a nation's sophisticated business strategy where funding is essential for the entrepreneurial activities. Based on the classification of national development levels and driving forces, it can be concluded that independent to the economy driver, the coordination needs to focus on the nations' context and mechanism which is essential to the Entrepreneurial Ecosystem and to enable higher level of growth (table 9). The intensity of a nation's integration into the Entrepreneurial Ecosystem depends on the ability to invent and upgrade, and above all, the aggregated engagement within the National Innovation System.

	Factor-driven	**Efficiency-driven**	**Innovation-driven**
Context	Opportunity perception	High growth	Risk acceptance/ Start-up skills
Mechanism	Cultural support	Technology absorption	Opportunity start-up/ Process innovation
Coordination	Supporting subsystems	Knowledge generation subsystems	Exploitation subsystems

TABLE 9 ENFORCEMENT MECHANISMS THAT SUPPORT ENTREPRENEURIAL ACTIVITIES.

Since the relationship is treated as a process; incentive, innovation, adoption, an analysis of what is happening in any part of it - say, in a single activity - can clarify details about the mechanism but is questionable beyond that. Despite these promising results, questions remain. Further research, focusing more on how the results of this study can be incorporated in the econometric models which are now being used in policy analysis, is therefore suggested.

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APPENDIX

1. DESCRIPTION OF THE 14 GEDI INDEX PILLARS OF AN ENTREPRENEURIAL ECOSYSTEM

***The Opportunity Perception*;** The pillar is responsible for the potential perception of a population regarding ownership and the legal burden that may limit the actual exploitation of entrepreneurial opportunities. It measures the percentage of opportunity to start a new company in the area in which they live. The institutional variable of freedom and property includes two variables; *Economic freedom* which includes the overall rules regarding start-up and operation and *Property rights* which includes the right to exploit their property or business without confiscating or self-confessing.

The variable is used and weighed with two variables describing the home market: the size of the domestic market and the degree of urbanization (combined here to reflect the agglomeration of the market). Urbanization is used to capture the idea that the pursuit of power is easier in urban areas, where customers tend to be closer and more prosperous than in poorer rural areas.

Start-up skills; Perception of the necessary start-up skills, which is measured by percentage of the population who believe they possess the values. For the population to acquire this knowledge, they need education beyond secondary school, something that has increased 53 percent in the last decade. Higher quality of human resources functions as a way out of poverty, thus this variable is weighed against the contribution from education.

Risk acceptance; Risk acceptance includes the fear of failure in entrepreneurial activity. The variable is defined as a percentage of the population who does not feel that fear of failure stops them from starting an activity. The variable is weighted against the countries risk.

Network; Entrepreneurs' potential to actively mobilize and join others in the country and the world. There are two components within the connection variable; Urbanization in the country and the quality of infrastructure. Network proxy is the key to success and must show the percentage of the population who has a connection to an entrepreneur and starts a business in the next two years.

Cultural support; This variable shows the status of entrepreneurship when it comes to the population's career choice. Also, the corruption level in the country affects these decisions. The measure is based on the average age of 18-64 age-olds who believe entrepreneurship is a good career choice. If the level of corruption is high, it may undermine the status of business career choice.

Opportunity Start-up; This shows entrepreneurs' motivation to start business and to face regulatory barriers like bureaucracy and tax payments. The variable is explained by two components; State service quality and cost of governance. GEM's explains the measure of opportunity entrepreneurs that they are better prepared and generate higher value than emergency entrepreneurs. This share falls within Total Entrepreneurial Activity (TEA) companies as they use a certain opportunity or other motivation to start the business.

Technology absorption; In today's economic development, the modern knowledge economy, i.e. information and communication technology (ICT), plays a decisive role. The coverage of new technologies and the capability to absorb it is central for innovative companies with high growth potential. Technology intensity varies depending on sector; the Technology Level variable is also a measure that shows companies in the technology field. Furthermore, the World Economic Forum reported absorption, which accounts for a country's capability to absorb firm at a fixed level.

Human capital; Human capital is a measure of the quality of the resources that the entrepreneurs possess. Generally, the higher the education they have, the greater the willingness is to start and manage growth companies. Therefore, the entrepreneur's education level is an important part of a company with high growth potential. Furthermore, there is an expectation that investment in personnel is profitable for increased work quality. The variable therefore measures the quality of the workforce in relation to the regulatory perspective and staff training and/or staff development.

Competition; Competition is a measure of the combination of regulation and market dominance. It can be explained as its business product or uniqueness in relation to the existing TEA actors' market power and the effectiveness of antimonopoly regulation. The variable aims to capture the "creative destruction" process (Schumpeter, 1996) and captures the power aspect of the barriers.

Product innovation; The ability to put new products on the market is an important part of every country's economy. The variable shows a quantitative indication of the entrepreneurial potential for new product innovation and creating waves of creative destruction. The variable shows a link on an institutional part, which can be explained as research institutes and the protection of intellectual property rights, as well as a technology transfer section that shows how the business environment enables product development.

Process innovation; The ability to create and apply new technologies is important for start-up companies' ability to continue their growth. The use of existing technology then turns into buying or copying the latest technology and should the development of new technologies cease, even growth would be hampered. The variable is a combination of research and development (R&D), scientific infrastructure and scientist's human capital availability.

High growth; A so-called gazelle company, whose measurements combine the share of high growth companies that plan to grow more than 50 percent and employ at least ten people. This should be done with a business strategy flexibility and risk capital financing. The strategy indicates the ability of the business to pull segregated strategies that differentiate and position them on the market. The variable thus combines growth potential with sophisticated business strategy and financing of specific venture capital.

Internationalization; The method is used to capture the internationalization of a country's contractors in relation to the activities of export potential and the production of complex products. A country's openness to applying international exports is important for growth purposes. These complex products are described as interacting between society expanding the knowledge base and creating more complex networks to produce products. The calculation of the variable was made by weighing internationalization against the country's economic globalization.

Risk Capital; The measure includes two funding; The informal investment and institutional depth of the capital market (DCM). Informal investors are relatively high in efficiency and innovation-driven countries and measured by multiplying the population of 18-64 years with the average size of the investment made in new businesses. DCM, in turn, measures the stock market size and liquidity of IPO, M&A, as well as debt and credit market functions on the nation's seven aspects of the debt and capital markets.

Risk Acceptance

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-,198	,104		-1,896	,067
	Product	-,105	,179	-,095	-,585	,563
	Process	,528	,174	,431	3,030	,005
	Internationalization	-,066	,109	-,055	-,608	,547
	Human	-,006	,151	-,003	-,037	,970
	Cultural	,010	,203	,008	,048	,962
	OpportunityStartup	,563	,204	,526	2,759	,009
	Technology	,314	,143	,267	2,188	,036
	Competition	-,179	,204	-,153	-,878	,386
	RiskCapital	,066	,166	,047	,395	,696

a. Dependent Variable: Riskaccept

High growth

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,090	,103		,876	,388
	Product	,099	,177	,160	,561	,579
	Process	-,150	,173	-,219	-,870	,390
	Internationalization	,183	,108	,273	1,696	,099
	Human	,302	,150	,319	2,018	,052
	Cultural	,134	,201	,194	,668	,509
	OpportunityStartup	-,083	,202	-,138	-,410	,684
	Technology	,395	,142	,599	2,783	,009
	Competition	-,284	,202	-,433	-1,408	,168
	RiskCapital	,068	,165	,087	,411	,684

a. Dependent Variable: HighGrowth

Start-up Skills

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,257	,140		1,832	,076
	Product	-,041	,241	-,051	-,170	,866
	Process	,475	,235	,540	2,024	,051
	Internationalization	-,040	,147	-,047	-,275	,785
	Human	,104	,203	,086	,513	,611
	Cultural	,109	,273	,124	,399	,692
	OpportunityStartup	,443	,275	,577	1,612	,116
	Technology	-,155	,193	-,184	-,804	,427
	Competition	-,425	,275	-,506	-1,549	,131
	RiskCapital	,049	,224	,049	,220	,827

a. Dependent Variable: Startup

Opportunity perception

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-,014	,080		-,170	,866
	Product	,229	,137	,225	1,677	,103
	Process	-,016	,133	-,014	-,119	,906
	Internationalization	-,070	,083	-,064	-,845	,404
	Human	-,005	,115	-,003	-,045	,964
	Cultural	,566	,155	,500	3,652	,001
	OpportunityStartup	,355	,156	,361	2,282	,029
	Technology	,174	,109	,161	1,596	,120
	Competition	-,025	,156	-,024	-,164	,871
	RiskCapital	-,233	,127	-,182	-1,834	,076

a. Dependent Variable: Opportunity