UNIVERSITETI I EVROPËS JUGLINDORE
УНИВЕРЗИТЕТ НА ЈУГОИСТОЧНА ЕВРОПА
SOUTH EAST EUROPEAN UNIVERSITY

Third Cycle of Studies

# "THE INNOVATION ECOSYSTEM IMPACT ON NEW PRODUCTS DEVELOPMENT AND FIRM PERFORMANCE: EVIDENCE FROM THE ICT SECTOR IN KOSOVO"

**(Doctoral Dissertation)**


**Candidate:**

**Herolinda Murati-Leka**

**Supervisor:**

**Prof. Dr. Veland Ramadani**

**February 2022**


## ABSTRACT

In a world with scarce resources, innovation should be considered as the preserver of the trichotomic well-being of economic, social, and environmental factors. Innovation enables sustainable development by increasing productivity and decreasing resource usage. Contemporary research in the field of innovation, sustainable development, and economics are being conducted to analyse and design different forms of organization of economic actors that enable and facilitate innovation. The focus of this paper will be on finding and analysing the symbiotic and reciprocal relationships among the actors and their impact. This would be the core finding toward doing further in-depth research about the impact of the Innovation Ecosystem in the ICT sector in Kosovo. The hypothesis will be constructed to determine the effect of certain actors of the Innovation Ecosystem on the firm innovation and performance indicators. The techniques used to identify, select, and analyse information will include both qualitative and quantitative approaches. The survey questionnaire will be designed by using measurement scales adopted from prior studies on this field. The scientific contribution of this study will be on mapping, analysing, and proposing a Sustainable Innovation Ecosystem in Kosovo based on its competitive advantage and potential to generate knowledge-driven growth with the main purpose of helping economic development.



**Keywords**: Innovation Ecosystem, ICT, Firm Performance, Firm Innovation, Open Innovation.

## Table of Contents

**LIST OF TABLES**

**LIST OF FIGURES**

# CHAPTER 1: INTRODUCTION

## 1.1. Introduction

This scientific research study has been conducted with the aspiration on expanding the understanding of the impact of the innovation ecosystem on product development and firm innovation performance. Notably, this study examines how innovation ecosystem (IE) actors, such as research institutions and universities, government, financial institutions, start-ups and enterprises, non-government organizations (NGOs) and development agencies, incubators and accelerators, and culture and social norms (Corrente el al., 2008; Striteska & Prokop, 2020) are correlated with innovative performance dimensions such as the firm introduction of new product or service, profitability, growth, and efficiency.

The introduction chapter starts with the study background and the scope of the study. Afterward, the research gap, research objectives, and research hypotheses will be explored. Furthermore, this chapter also delineates the expected outcomes of the study. In the end, it concludes with the provision of the structure of the thesis.

## 1.2. Background

The evolutionary history of living species has shown that species that have adapted to changes in the environment and those that have cooperated have managed to maintain their survival. This is especially true for humans. Considering the prerequisite that humans also are 'Homo economicus', we must conclude that adaptation to change and cooperation must be applied in the economic arena. Union makes power while cooperation creates success. In a world with scarce resources, innovation should be considered as the preserver of the trichotomic well-being of economic, social, and environmental factors. Innovation enables sustainable development by increasing productivity and decreasing resource usage. Consequently, it brings the necessity to research and finds adaption pathways to business survival as a way of dealing with consistent changes in the outer environment, which lately is more vibrant than before. Contemporary research in the field of innovation, sustainable development, and economics are being conducted to analyse and design different forms of organization of economic actors that enable and facilitate innovation. This study will examine the impact of the Innovation Ecosystem on firm innovation performance and the development of new products in the ICT sector in Kosovo. This sector takes a considerable part in the employment rate and contributes to a significant share of the GDP of Kosovo. The Government of Kosovo officially declared the ICT industry a high priority sector for its economy (Government of Kosovo, Ministry of Economic Development, 2013, p.5). The focus of this paper will be on finding and analysing the symbiotic and reciprocal relationships among the actors of the Innovation Ecosystem and how the emotional proximity between the actors benefit them with a special emphasis on their impact on innovation. This would be the core finding toward doing further in-depth research about the impact of the Innovation Ecosystem in the ICT sector in Kosovo. In this paper, the main actors of the innovative ecosystem in Kosovo's ICT sector will be selected to be analysed, and then their impact on innovation and development of new products will be researched and measured separately. The geographical aspect will occupy an important place in the magnifying glass of the scientific research of this paper to understand how companies benefit from collaboration and their location. In-depth research will be conducted to see how ecosystem actors perceive their concurrent roles in the selected innovation ecosystem. This study will give a comprehensive overview of the

current situation of innovation and entrepreneurship in Kosovo. It will give deductible answers to many important topics like:

- What are the core growth drivers and motivations of the Kosovar founders to set up and run a start-up in the ICT industry?
- What are the core challenges that Kosovar ICT businesses struggle with?
- How is the current state of ecosystem development in Kosovo?
- What kind of support is available to start-up companies in Kosovo?

Afterward, it will be analysed the economic situation of the country to prioritize economic activities that have competitive advantages and bring economic transformation to cope with urgent challenges for society. A cross-industry cooperation model of a sustainable innovation ecosystem between the ICT sector on one hand and the agriculture, medicine, military, or/and tourism sector, on the other hand, may be proposed as a way for Kosovo's economy to cope with changes that the global economy is experiencing. This could also be seen as an attempt to help Kosovo's economy to define its competitive advantages.

To propose an effective construction of an innovation ecosystem will be used the bottom-up mentality as a way to bring together universities, businesses, local government, and civil society to work on developing long-lasting sustainable growth strategies. The scientific contribution of this research will stand on enhancing the definition of the innovation ecosystem. Since we are presenting The Digital Era, the innovation ecosystems can be considered as an economic formation that can exceed the physical boundaries between countries and be integrated globally using technological tools. Collective Intelligence (CI)

should be considered as a strategy and Artificial Intelligence (AI) should be considered as the future tool of the Innovation Ecosystem.

The last part of the study will analyse the core similarities and differences between innovation ecosystems as the initial effort to propose a sustainable model of an innovation ecosystem that will be applied widely in the industry. The goal is to explore how they differ and how to survive and prosper within them by reimaging or remodelling the connections between ideas, people, and technology.

This research, among other contributions, will pave the way for recognition and acceptance the open innovation as a research field. It will also enhance sustainable consideration by decision-making actors, and it will increase social awareness about resource usage.

## 1.3. Scope

To write a comprehensive scope, there has been outlined the limitation of the study. Considering that the innovative ecosystems (IE) are not static configurations with predefined actors, which do not differ from each other, also considering that the focus of this study is on finding the correlation between the actors of the innovative ecosystem and their impact on the firm performance, the scope of this study extends as follows:

- Even though different scholars have emphasized a different number of Innovation Ecosystem (IE) actors, this study will research seven of them (those which are predominantly active in the respected Innovation Ecosystem researched in this study).
- The focus of the study will be only on the ICT sector in Kosovo.

- Considering that there is no consensus about the performance measurement among the scholars (Al-Matari et al., 2014; Birchall et al., 2011; Murphy et al., 1996; Santos & Brito, 2012; Venkatraman & Grant, 1986), and taking into account that if several dimensions exist, a researcher should choose the dimensions most relevant to his or her research and judge the outcomes of this choice (Richard et al., 2009), there have been selected carefully financial and non-financial measurements. This study will use profitability, growth, efficiency, and firm introduction of new products as the dimensions of the overall firm innovation performance.

## 1.4. Research gap

The research gap that has not been answered in the respective research area of interest has been addressed by the research hypothesis identified in the next section of the study. As a new topic of study, the innovation ecosystem has attracted the attention of a wide number of scholars. Despite that, there is a limited number of empirical research in this field. The vast majority of the studies on this topic are of theoretical nature. According to Howells and Elder (2011), the literature on innovation has reflected a growing interest in the idea of an innovation ecosystem as a mechanism to improve the flaws in "structural innovation''. Furthermore, as Adner and Kapoor (2010) explains, the strategy and the innovation literature have traditionally dealt with the innovation challenges that are mainly faced by the focal firm, rather than the whole ecosystem. As Leon (2013) explains, the analysis of innovation ecosystems can be done at macro, meso, or micro levels depending on the emphasis placed on policy instruments and the type of activities of the research interest. Through this research, it is attempted to study a certain set of actors within the whole innovation

ecosystem to get a more in-depth understanding of interactions taking place among the actors and give answers to the research hypotheses of the study. There is a limited effort in the contemporary scientific literature on systematizing the innovation ecosystem actors and measuring their impact with a special emphasis on innovation. This study tries to close the gap, through careful studying about this issue.

Moreover, to the best of my knowledge the concept of the innovation ecosystem, respectively the impact of the innovation ecosystem in the new product development and firm innovation performance is not studied at all in the region (Kosovo and its neighbouring countries) therefore this research will be the first study in this field. As a result, this study will fill a considerable gap in the regional literature and even will contribute to the gap in worldwide innovation ecosystem literature.

## 1.5. Research objectives

To have a better and clearer view, the research objective of this study is divided into general and specific objectives.

### 1.5.1. General objective

The general objective of this study is to determine the impact of the innovation ecosystem on product development and firm innovation performance.

### 1.5.2. Specific objectives

The specific objectives of the study are:

1. To determine the impact of research institutions and universities on new product development and innovation performance of the business participants of the innovation ecosystem.

2. To examine the impact of the government on new product development and innovation performance of the business participants of the innovation ecosystem.

3. To measure the impact of the financial institution's support on new product development and innovation performance of the business participants of the innovation ecosystem.

4. To define the impact of other start-ups and enterprises on new product development and innovation performance of the business participants of the innovation ecosystem.

5. To examine the impact of non-government organizations (NGOs) and development agencies on new product development and innovation performance of the business participants of the innovation ecosystem.

6. To measure the impact of incubators and accelerators on new product development and innovation performance of the business participants of the innovation ecosystem.

7. To examine the impact of the culture and social norms on new product development and innovation performance of the business participants of the innovation ecosystem.

## 1.6. Research hypothesis

The research hypothesis or the research problem of a Ph.D. thesis usually is more theoretical, and a Ph.D. research problem may not be purely a 'problem-solving' one, but it should 'test out' the limitations of beforehand proposed generalisations (Phillips and Pugh, 2015).

Based on the extensive literature review the general and specific hypothesis is defined:

*The general hypothesis is:*

***H: Innovation Ecosystem has a significant impact on the overall firm innovation performance.***

*Specific hypotheses are:*

***H1: Research institutions and universities have a significant impact on overall firm innovation performance.***

***H2: Government has a significant impact on overall firm innovation performance.***

***H3: Financial Institutions have a significant impact on overall firm innovation performance.***

***H4: Cooperation with other start-ups and enterprises has a significant impact on overall firm innovation performance.***

***H5: Non-government organizations and development agencies have a significant impact on overall firm innovation performance.***

***H6: Incubators and Accelerators have a significant impact on overall firm innovation performance.***

***H7: Culture and social norms have a significant impact on overall firm innovation performance.***

## 1.7. Contributions

The scientific contribution of this study elaborated and researched below will be on mapping, analysing, and proposing a Sustainable Innovation Ecosystem in Kosovo based on its competitive advantage and potential to generate knowledge-driven growth with the main purpose of helping the economic development. This research, among other contributions, will pave the way for recognition and acceptance the open innovation as a research field. It will also enhance sustainable consideration by decision-making actors, and it will increase social awareness about resource usage. There are not many empirical studies conducted on this topic even though in the last decade it has been a very attractive research field among the scientific community. The expected outcome of this research is to contribute to the gap in the literature by providing a first study that examines the impact of the innovation ecosystem on product development and firm innovation in Kosovo. Moreover, by answering the research hypothesis, this research will fill the gap also in the international literature about this topic since there is a deficiency of empirical studies. The results of the study can be helpful for economic policymakers. Therefore, they may use the results derived from the research to create better policies to improve the entrepreneurship and innovation climate so the innovation ecosystem performance may progress. The actors of the innovation ecosystem may also benefit from this study by adopting some of the concepts introduced in this research, like Collective Intelligence and Artificial Intelligence as future strategies, respectively tools of doing business in the Digital Era. Finally, this research will probably rise the enthusiasm and interest among other scholars to conduct further research in this very attractive field of study.

## 1.8. Structure

This doctoral thesis in its content will include five chapters elaborated below. As explained by Perry (1995), a five-chapter structure can be used to effectively present a Ph.D. thesis. The figure below summarizes the model of the chapters of a Ph.D. thesis.

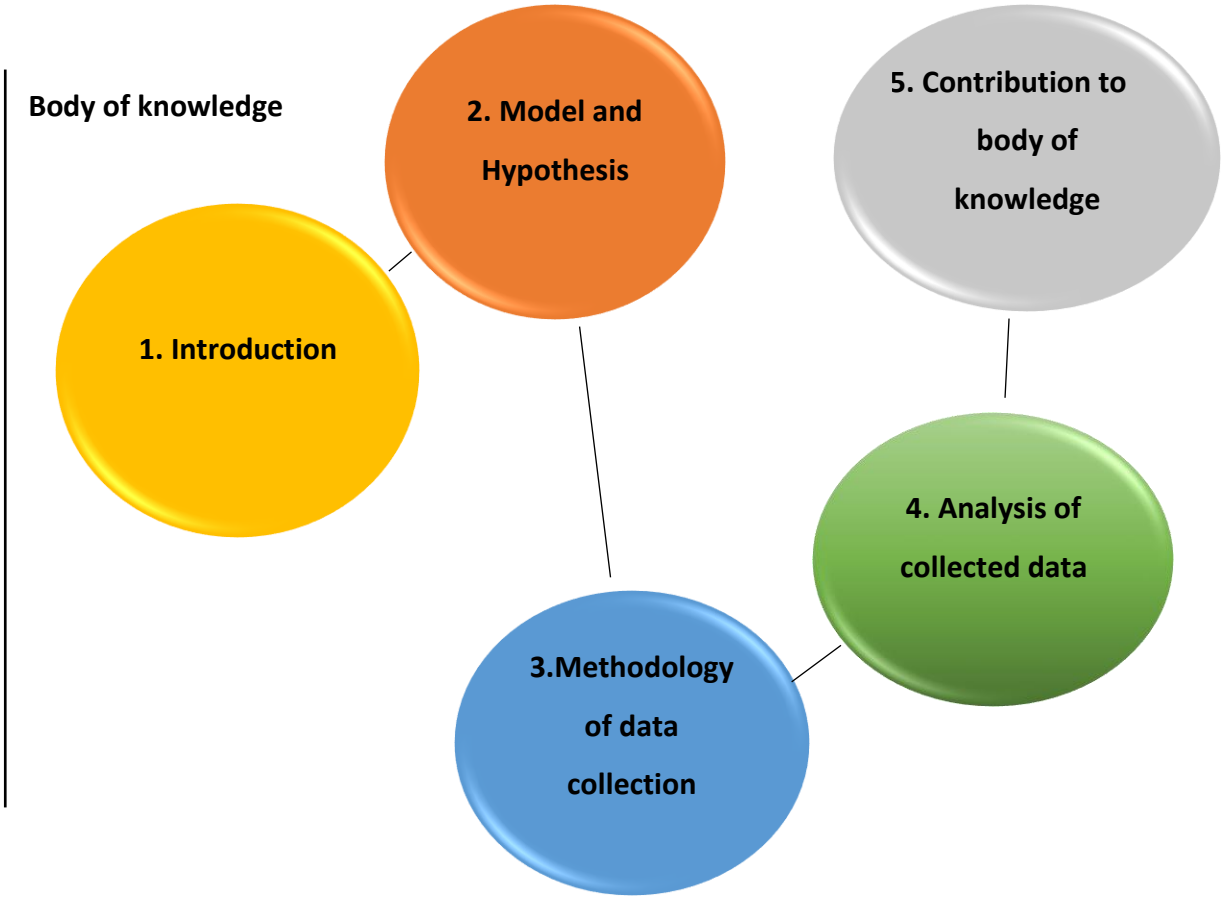


*Figure 1. Model of the chapters of a Ph.D. thesis*

**Source: Based on Perry (1995)**

The content of each chapter is explained briefly, as follow:

**Chapter 1 – Introduction:** This chapter starts with the introduction of this study then continues by giving an overview of the background, the scope, and the research gap. Afterward, this chapter puts forward the objectives and hypotheses of the study. In the last part, the contribution of the study has been elaborated.

**Chapter 2 – Literature review:** This chapter gives an overview of the existing literature and theories related to the topic of the Innovation Ecosystem (IE). Notably, this chapter covers the genesis and development of the notion of the innovation ecosystem, the core similarities, and differences among other ecosystems, the actors of the innovation ecosystem. It also provides a more detailed explanation of the most successful practices of innovative ecosystem functioning. In the end part of the chapter, there has been explained the conceptual framework of this study.

**Chapter 3 – Methodology:** In this chapter, it is interpreted the research methodology used in this study, the research process, the approach that it is used, and the research design. Afterward, this chapter explains the data collection methods used in this study, the study variables, the data analysis method, and the pilot testing.

**Chapter 4 – Findings and Analysis of Data:** This chapter provides the data collection process and the analysis of the data. In this chapter, there has been used inferential and descriptive statistics. This chapter is supposed to have more numbers, graphs, and tables than the others because it is assumed to measure and test all that is said in the previous chapters to provide conclusions and recommendations in the next chapter.

**Chapter 5 – Conclusions, recommendations, and limitations of the study:** This chapter will explain the research results of the study, which will be followed by the recommendations given by the author. In the end, based on the set of limitations discovered in the study, it is incorporated the recommendation and the suggestion for future research.

# CHAPTER 2: LITERATURE REVIEW

## 2.1. Introduction

This chapter gives an overview of the existing literature and theories related to the topic of the Innovation Ecosystem (IE). It will be also introduced the history and the evolution of the IE, the definition of IE, the core similarities, and differences among other ecosystems. The chapter among others will present in detail the actors of the innovation ecosystem, their symbiotic relationship, and their impact on the IE. It also provides a more detailed explanation of the most successful practices of innovative ecosystem functioning.

## 2.2. Innovation: definitions, types, and process

*"Innovation is a change that creates a new dimension of performance." -Peter Drucker*

If we had to describe innovation in just one word, it would be 'new'. Therefore, innovation is bringing something new. However, this description is very comprehensive and not specific. Although, many scientists have done and still research the definition, types, and innovation process. Innovation is explored and studied through different perspectives of scientific magnifying glass, so there are both approximate and different definitions. However, one thing is for sure, innovation, especially, in the stage of globalization and technological development, is the headline of every economy, or business in more detail. Innovation is the process of making changes, large and small, radical and incremental, to products, processes, and services that result in the introduction of something new for the organization that adds value to customers and contributes to the knowledge store of the organization (O'Sullivan & Dooley, 2009). Innovation is the process that turns an idea into value for the customer and results in sustainable profit for the enterprise" (Carlson and Wilmot, 2006). As Rexhepi et al. (2013, 2018) find, innovation is considered one of the main sources for enterprise growth. Ramadani and Gerguri (2011), show that the main benefit from innovation toward businesses is the improvement of products and services offered to customers. Innovation is a common process, which incorporates different actors, processes, and forms. Innovation is the creation of a new product-market-technology-organization-combination, 'PMTO-combination' (Boer and During, 2001).

As (Rothaermel, 2013) explain, innovation is the commercialization of any new product, process, or idea, or the modification and recombination of existing ones, which

departs significantly from prior ones (McKinley et al., 2014). Furthermore, Baregheh et al., (2009) see innovation as a multi-stage process whereby organizations transform ideas into new/improved products, service or processes, to advance, compete and differentiate themselves successfully in their marketplace. Basically, innovation is the transformation of knowledge into new products, processes, and services (Porter & Stern, 1999). The basic idea is that the product, service, or process should be new, and be commercialized, which is the main difference between innovation the invention. As Fagerberg (2004) distinguishes, the invention is the first occurrence of an idea for a new product or process while innovation is the first commercialization of the idea. Sometimes is hard to distinguish one from another.

Innovation is an integral part of global trends, as such, cannot escape the impact of these changes. As Archibugi and Iammarino (2002) explain, the concept of globalization of innovation is the zip between two fundamental phenomena of modern economies: the increased international integration of economic activities and the rising importance of knowledge in economic processes. As we can see, innovation is all-encompassing and touches all areas of our lives. Therefore, as such, it cannot be monopolized by a single scientific discipline because the scientific research of this phenomenon would be shallow and not comprehensive due to the impact of innovation in social and economic aspects. As suggested by Fagerberg (2004), a cross-disciplinary perspective should be done because no single discipline deals with all aspects of innovation.

The innovation process involves the exploration and exploitation of opportunities for a new or improved product, process, or service, based either on an advance in technical practice(“know-how”), or a change in market demand, or a combination of the two, which according to Utterback (1971) it occurs in three phases: 1) idea generation; 2) problem

solving; 3) implementation and diffusion. In the literature of innovation, we can find different 'types' of classification. Joseph Schumpeter (1934) identified five types of innovation:

- new products or services,
- new methods of production,
- new sources of supply,
- the exploitation of new markets and,
- new ways to organize a business.

Another author distinguishes between different types of innovation. This author ranks the types of innovation based on the impact or degree of change that innovations bring. According to Drucker (1993), there are four basic types of innovation:

- Incremental Innovation — doing more of the same things with better results.
- Additive Innovation — More fully exploiting already existing resources
- Complementary Innovation — something new and changes the structure of the business.
- Breakthrough Innovation (Radical Innovation) — Changing the fundamentals of the business or creating a new industry.

An important finding in the innovation literature is that companies do not innovate in isolation but depend heavily on interaction with their outer environment. Different concepts have been introduced to enrich this phenomenon, the vast majority of them incorporate the terms "system" or "network". Furthermore, the systemic interdependencies between the initial and induced innovations also imply that innovations (and growth) "tend to concentrate in certain sectors and their surroundings" or "clusters" (Schumpeter, 1939). In the following

chapters, the innovation will be studied, explored, and measured in a wider scope, as a part of an innovation ecosystem.

## 2.3. The Origin and the Evolution of Ecosystem in Economics

The term „ecosystem" is not a new concept in the field of business research it dates back to 1930. Since the introduction of this term, additives or related terms have been added to it, thus taking on different scopes and objectives, but the same general goal, the cooperation between actors. The term ecosystem derives from the science of ecology. Social science has approached the economy as an ecosystem (Rothschild, 1990), viewing the global economy as an entity in which organizations and consumers are the living organisms, furthermore, it was Moore (1996) that proposed an analogy between the biological world and business world, and he coined the terms business ecosystems. Starting from its re-introduction two decades ago by Moore (1996), scholars have studied different ecosystems that are related to the economy, like industrial ecosystems (Frosch and Gallopoulos, 1989; Galateanu and Avasilcai, 2013; Korhonen, 2001; Peltoniemi, 2005;), business ecosystems (Galateanu and Avasilcai, 2013; Iansiti and Levien, 2004; Moore, 1993; Moore, 1996; Peltoniemi and Vuori, 2004), digital business ecosystem (Isherwood and Coetzee, 2011; Nashira, 2002), entrepreneurship ecosystem (Ahmad and Hofman, 2008; Guerrero et al., 2016; Isenberg, 2010), knowledge ecosystems (Clarysse et al., 2014; Van der Borgh et al., 2012), platform ecosystems (Baldwin and Woodard, 2009; McIntyre and Srinivasan, 2016; Tiwana et al., 2010), and lately the innovation ecosystem (Adner, 2006; Carayannis and Campbell, 2009; Durst and Poutanen, 2013; Still et al., 2014; Wessner, 2007; Yawson, 2009).

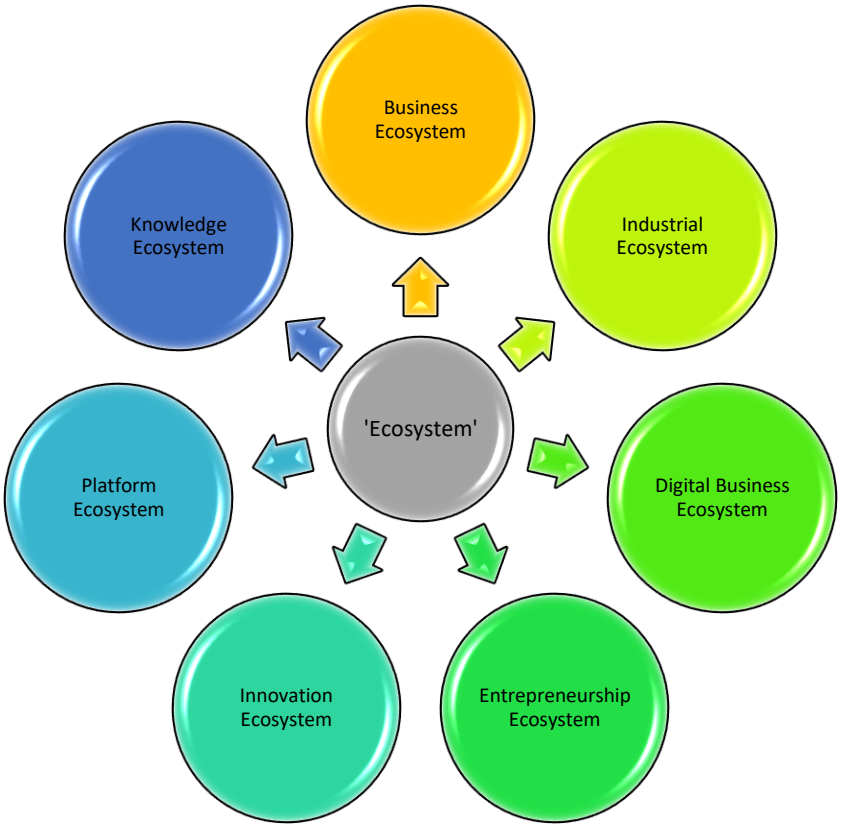



*Figure 2. Different Ecosystems that are related to the Economy*

**Source: Candidate**

## 2.4. The History and Evolution of Innovation Ecosystem

The base of an innovation ecosystem is the concept of a national innovation system (Wessner, 2007). The concept of the innovation ecosystem in the initial phases has been used related to the concept of business ecosystems as used by Moore (1993) and other authors in the field of business research. An Innovation Ecosystem refers to a loosely interconnected network of companies and other entities that coevolve capabilities around a shared set of technologies, knowledge, or skills and work cooperatively and competitively to develop new products and services (Moore, 1993). Mercan & Göktaş (2011) specify that an "innovation ecosystem consists of economic agents and economic relations as well as the non-economic parts such

as technology, institutions, sociological interactions, and the culture", furthermore, Granstrand and Holgersson (2020) have explained in more details the functioning of an innovation ecosystem, they explain it as a set of actors, activities, and artifacts, and the institutions and relations, including complementary and substitute relations, that are important for the innovative performance of an actor or a population of actors. Innovation ecosystems have been defined as human networks that generate extraordinary creativity and output on a sustainable basis Hwang and Horowitt (2012), specializing in the exploitation of a shared set of complementary technologies or competencies Gobble (2014). As Valkokari (2015) states that Innovation ecosystems occur as an integrating mechanism between the exploration of new knowledge and its exploitation for value co-creation in the business ecosystem. According to Howells and Elder (2011), the literature on innovation and business research has shown a growing interest in the idea of an innovation ecosystem as a mechanism to improve the flaws in "structural innovation". As Adner et al. (2013), explains, scholars have proposed the construction of an innovation ecosystem to capture the cross-industry and cross-country complexity of the innovation process.

## 2.5. Emerging Nature of Innovation Ecosystem

As explained in previous chapters, the term innovative ecosystem is a new concept. In the course of its development, this concept has brought with it innovations which we can say are of added value in the economy in general. Some of these we can mention, like new models of knowledge creation and innovation, the opening of the innovation process with special care in sustainability, opening of the economy in general, etc.

As Mercan & Göktaş (2011) claims, the innovation ecosystems approach is an emerging approach because systems of innovation approach have not made a distinction

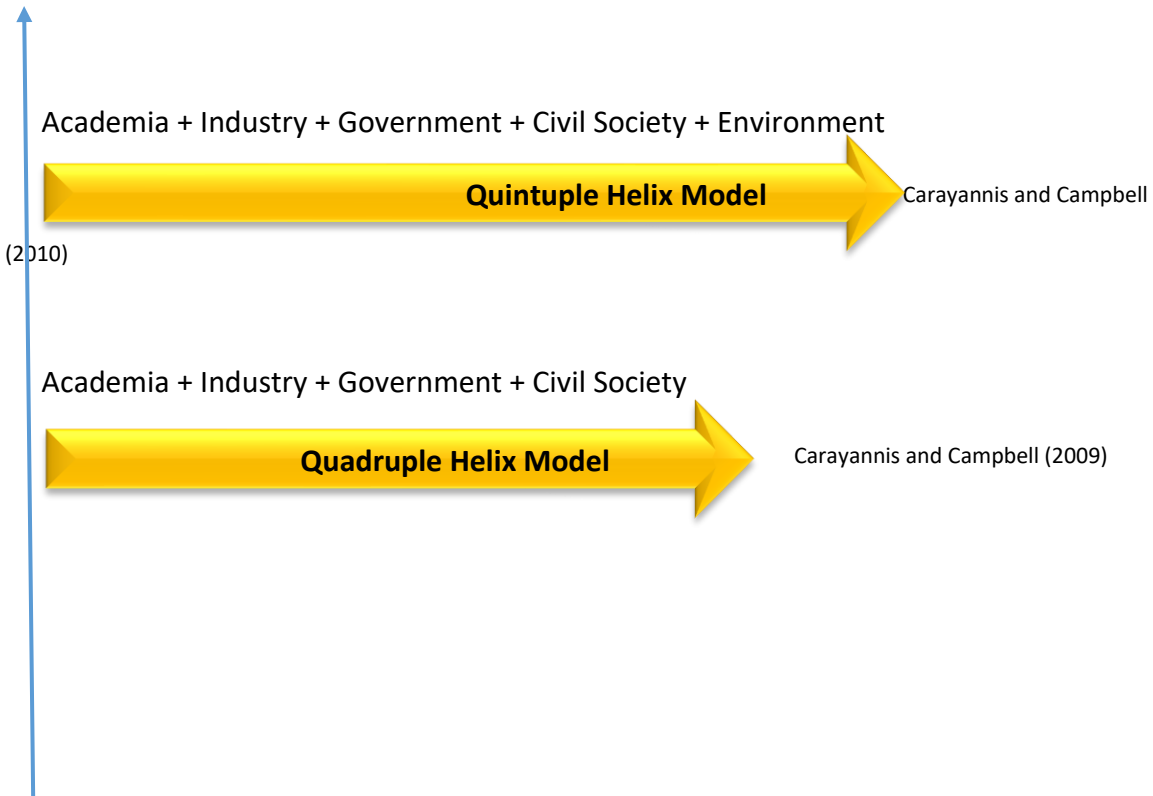
between innovation events and innovation structure. Below there will be briefly elaborated some of the emerging themes of innovation ecosystems.

### 2.5.1. Innovation Models Milestones - from Mode 1 to Quintuple Helix Model

In this chapter, there are explained the milestones of innovation and knowledge models. The focal point is to stress out the co-development and co-specialization of different actors of respective systems. First to be introduced, was 'Mode 1' (Gibbons et al., 1994), which according to the authors, focuses on the traditional role of university research in an elderly ''linear model of innovation'' understanding, which does not focus on features concerning problem-solving for the society or the economy. Since the 1980s, universities became progressively a pivotal economic actor of the system of innovation and regional development thanks to their assignment of producing knowledge (Carayannis, 2013) making universities move from their positions of 'ivory tower' - Mode 1 to the entrepreneurial paradigm - Mode 2 (Etzkowitz and Leydesdorff, 2000). As Gibbons et al. (1994) explain, The specific characteristics of the innovation model "Mode 2" compared to the model "Mode 1" are the following ones: knowledge is "produced in the context of application"; "heterogeneity and organizational diversity"; "social accountability and reflexivity"; and, "quality control". Moving forward, the 'Triple Helix' model of knowledge, developed by Etzkowitz and Leydesdorff (2000), explains three 'helices' that intertwine and by this generate a national innovation system: academia, industry, and government. With the overlapping helices of academia, university, and government, it is tried to explain the tri-lateral way of co-operation and influence among them.

In the extension of the 'Triple Helix' model Carayannis and Campbell (2009) suggest a 'Quadruple Helix' model which means adding to the above-stated helices a 'fourth helix' that

is identified as the “media-based and culture-based public”. According to Carayannis and Campbell (2012) in the ‘Quadruple Helix’ model, government, academia, industry, and civil society are seen as key actors promoting a demographic approach to innovation. Understanding that the process of innovation and knowledge is not a static formation of actors, and after the introduction of ‘N-Tuple of Helices’ (Leydesdorff, 2012), the authors Carayannis and Campbell (2010) expand their ‘Quadruple Helix’ model to ‘Quintuple Helix’ model by adding the environmental mode to the model. In the figure above there are illustrated by the author the innovation and knowledge model milestones – from Mode 1 to the Quintuple Helix Model.



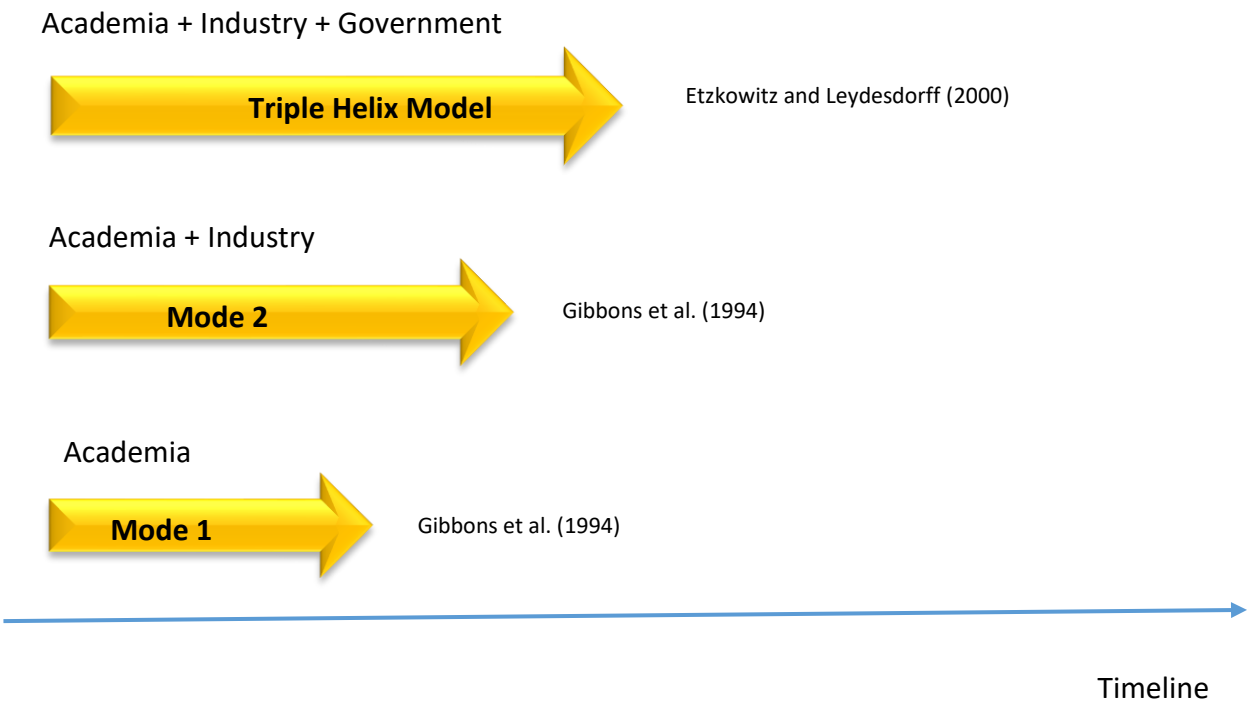



*Figure 3. Innovation and knowledge model milestones*

**Source: Candidate**

### 2.5.2. Open-Innovation Sustainability

Conventionally, the process of innovation has been considered as an integrative internal part of a business. Such a mind-set has committed all business resources to innovate preserved within the business. As Chesbrough and Crowther (2006) emphasize that innovation has generally been conducted internally and firms barely resort to sharing innovative outcomes with partners by meaning to generate competitive advantage. Furthermore, in his book,

Chesbrough (2011) describes the open innovation as an innovation paradigm shift from a closed to an open mode.

The globalization trends, such as technological development, dynamism in the circulation of goods and services, the emergence of new professions, have made the process of innovation in business come out of the closed box, and the openness of business actors as the dominant behaviour. Such a transformation is known as open innovation. This process has progressed concerning the emergence of new forms of organization and cooperation of various actors, one among them is known as the innovative ecosystem. In an open-innovation pattern, companies have taken the advantage of exploring other actors of the ecosystem, but are also prepared to commercialize their innovations in cooperation with third-party actors who might be more befitted to put the innovations to market. As Teece (2007) points out, companies must constantly scan, search, and explore technologies and markets.

Along with the process of transformation from closed to open innovation, the business mentality for sustainable development has also evolved. So far, the theory and practice explored have demonstrated links between innovation and sustainability at the firm and supply chain levels; at the innovation ecosystem level, there are still research gaps, however, at the ecosystem level in general, the concept of sustainable innovation means much more (Liu and Stephens, 2019). Despite the benefits of openness to innovation, hence many businesses have concerns about that. As mentioned by Von Hippel (2006), the concern of open innovation is with the sources of innovation and willingness of organizations to perform flexible control, as either innovators or/and innovation adopters, over their innovation pipelines and processes.

Different authors have different approaches or points of view about the open-innovation ecosystem. An interesting approach gives Leon (2013), he sees open innovation ecosystem as a subset of the innovation ecosystem, more precisely, he defines open innovation ecosystem as 'an innovation ecosystem where a substantial number of the supported activities are classified as open-innovation initiatives'. As mentioned by Rexhepi et al. (2019), researchers and practitioners need to rethink the design of innovation strategies in a networked world; they need to seek new sources of innovation, which can be found in the new concept of open innovation.

### 2.5.3. Sharing Economy

It is worth mentioning that business evolution and profit are associated with the two most prominent characteristic features of the innovation ecosystem, which are, innovation and sustainability. These features can be performed in a business climate that supports and fosters the concept of a sharing economy. As Adner (2006) mentions, the crucial hope behind ecosystem thinking is to expand the capabilities of one actor beyond its limits and transfer knowledge into innovation and collaboration with other actors. Furthermore, Liu and Stephens (2019) explain and give industry practice suggestions, like co-creating knowledge, stakeholder engagement, working together with partners and customers for solutions related to technology, product development, and environmental sustainability. All these actions can be aggregated to the term sharing economy. According to Richardson (2015), the sharing economy converges around activities facilitated through digital platforms that enable peer-to-peer access to goods and services; but the author explains the concept in the scope of both opportunities and critiques, with a conclusion that the sharing economy should serve as a prompt to engage with the digital transformation of the economy in the spirit of affirmative

critiques and no tolerating polarisation of ownership and inequalities. Furthermore, in her three-year study of both non-profit and for-profit initiatives in the sharing economy, Schor (2016) comes to conclusions that these new technologies of peer-to-peer economic activity are potentially powerful tools for building a social movement centred on genuine practices of sharing and cooperation in the production and consumption of goods and services. The author says that to achieve that potential there must be some requisitions like the democratization of ownership and the governance of platforms. Felländer et al., (2015) elaborate in a figure the sharing economy, they emphasize that their term comprises the peer-to-peer exchange of tangible and intangible slack (or potentially slack) resources, including information, in both global and local contexts (see figure below).

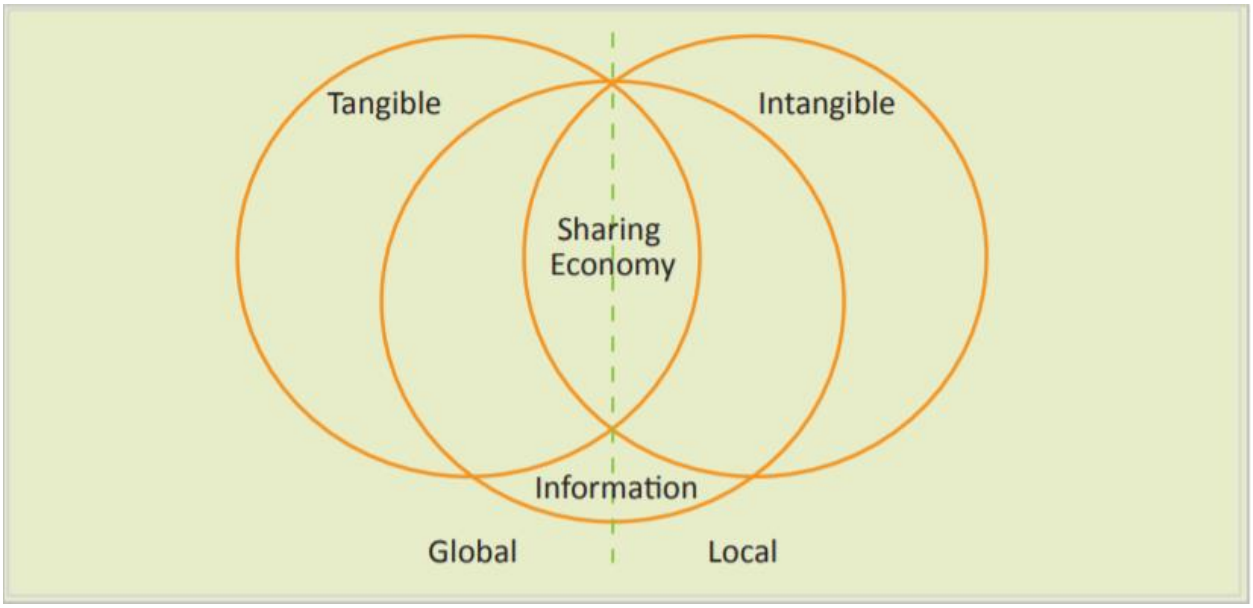



*Figure 4. Sharing Economy*
**Source: Felländer et al. (2015)**

Corresponding to the main term of this research study, it is worth mentioning that a well-constituted and well-functioning innovation ecosystem may be seen as a friendly

environment of practicing the sharing economy, in the term of minimizing the negative externalities like dispersion of ownership and predatory business relationship.

## 2.6. The Need for Innovation Ecosystem

In recent decades, the innovation process has been shifted from a closed to a more open process. This has been achieved from the collaborations and innovation ecosystems approach and mind-set. Innovation ecosystems have been identified as unique opportunities for all stakeholders of the industry to actively engage in solving future challenges and opportunities. Adner and Kapoor (2010), point out that the success of an innovative firm often depends on the efforts of other innovators in its environment, furthermore, Basole and Rouse (2008) explain the independence of firms that, from symbiotic relations create and deliver products and services. They shed light on how firms are increasingly interdependent in their business and innovation activities. Open-minded innovators approach innovation holistically. According to Adner (2006), innovation ecosystems can be defined as "the collaborative arrangements through which firms combine their individual offerings into a coherent, customer-facing solution" on the other hand Iansiti and Levien (2004), explain a benefit of the businesses participating in an ecosystem, they state that ecosystems participants should enjoy high survival rates, either overtime or relative to other, comparable ecosystems. The participants of any ecosystem create their value chain which has been mentioned and explained by Porter (1985), where complimentary products supplied often by third parties outside the value chain (Teece, 1986) help in the increase of the production values in the ecosystem. This integration of these complementary products with the value chain results in a new term known as ''value network'' as mentioned by Amit and Zott (2001), known also as ecosystems. Their importance has been recognized in the different industries and also in the

scholarly area. The fundamental hope behind ecosystem thinking is to expand the capabilities of one actor beyond its boundaries and transfer knowledge into innovation in collaboration with others (Adner, 2006). For this, technology plays an important role, as Dodgson et al. (2006) emphasize the efficiency and effectiveness of cooperation between network member firms are often facilitated through the use of information technologies. An innovation ecosystem stimulates and provides a manageable flow of knowledge and information between its actors and offers an environment that embraces the culture of creativity, cooperation, and innovation.

### 2.6.1. Resource Usage

There exist two ways of increasing the economic output of an economy: the increase of the number of inputs in the process of production or thinking of new ways to get more output from the same amount of inputs. Thinking this way, innovation is considered to be the core source of wealth generation within the economies. As Schumpeter (1942), explains the concept innovation which is defined as ''the introduction of new or significantly improved products (goods and services), processes, organization methods, and marketing methods in internal business practices on the marketplace'', we can come to the conclusion that the innovation ecosystem is created to help and facilitate the execution of the innovations and the actors of such ecosystem are very creative and innovators, as Drucker (1998) explains that the innovativeness is that entrepreneur that creates welfare, new resources or increases the capacity of use of existing resources. Furthermore, innovation ecosystems create spaces for sustainable development as a way of developing without compromising the future generation's abilities to meet their needs. In conclusion, it is worth mentioning that the innovation ecosystems are the most sophisticated forms of organizations, which meet and

preserve the economic, social, and environmental well-being and enable sustainable development by increasing productivity and decreasing resource usage.

## 2.7. Characteristics of Innovation Ecosystem

Since the genesis of the introduction of the term 'ecosystem' in the world of economics, different terms, characteristics, and forms of organization have been added to this term. Scholars of this field in their scientific research have tried and are constantly trying to establish scientific frameworks to define these terms as accurately as possible to give us a more concise understanding of how different types of ecosystems differ, what are their characteristics, which are the actors, their interconnection, their value creation, etc.

For instance, in management and innovation studies, meta-organizations such as ecosystems have been approached with different concepts (Gulati et al., 2012), furthermore, it was Valkokari (2015) who agreed and added that there exist several partly overlapping concepts – such as business ecosystem, innovation ecosystems, and knowledge ecosystem – to describe the meta-organizations among economic actors.

It is worth mentioning that it is a matter of the scientific point of view or scientific approach followed by authors. As proposed by Weber and Hine (2015), rather than focusing on ecosystems as platforms, a scientific model of research shall be explored where ecosystems are approached as structures of and relationships among interacting actors. As Valkokari, (2015) explains, system frontiers can be set in various forms:

- by geographical scope (local vs. regional or national vs. global),
- by temporal scale (from history to future or static snapshots vs. dynamic interactions),

- by permeability (open vs. closed), as well as
- by types of flows (knowledge, value, material).

Advancing above the basic circumstantial view, ecosystems have also been recognized as dynamic and purposive networks in which actors co-create values (Adner and Kapoor, 2010; Lusch et al., 2010). As you will see in the following table, the distinctive features of the most prominent ecosystems in the world of economics are explained.

*Table 1. Characteristics of ecosystem types*

| | BUSINESS ECOSYSTEM | INNOVATION ECOSYSTEM | KNOWLEDGE ECOSYSTEM |
|---|---|---|---|
| BASELINE OF ECOSYSTEM | Resource exploitation for customer value | Co-creation of innovation | Knowledge exploration |
| RELATIONSHIPS AND CONNECTIVITY | Global business relationships both competitive and cooperative | Geographically clustered actors, different levels of collaboration and openness | Decentralized and disturbed knowledge nodes, synergies through knowledge exchange |
| ACTORS AND ROLES | Suppliers, customers, and focal companies as a core, other actors more loosely involved | Innovation policymakers, local intermediators, innovation brokers, and funding organizations | Research institutions, innovators, and technology entrepreneurs serve as knowledge nodes |
| | The main actor that operates as a platform sharing | Geographically proximate actors interacting around | A large number of actors which are grouped around |

| | | | |
|---|---|---|---|
| LOGIC OF ACTION | resources, assets, and benefits or aggregates other actors together in the networked business operations | hubs facilitated by intermediating actors | knowledge exchange or a central non-proprietary resource for the benefit of all actors |

**Source: Based on Valkokari (2015)**

As Basole (2009) mentions, a defining characteristic of innovation ecosystems is their ability to adapt and evolve. Furthermore, other authors have highlighted different characteristics of the innovation ecosystem. Thomas and Autio (2019) identify four characteristics of innovation ecosystems: community heterogeneity, ecosystem-level out-puts, participant interdependence, and distinctive governance. Pilinkienė and Mačiulis, (2014) in their scientific research draw analogical parallels between ecosystems in economics. In the following table, we will see a summary of characteristics, actors, impact on the micro and macro environment, as well as key determinants affecting the innovative ecosystem.

*Table 2. A brief overview of the innovative ecosystem*

| | |
|---|---|
| AUTHORS | Adner, 2006; Wessner, 2007; Yawson, 2009 |
| ACTORS | Entrepreneur; Large and small enterprises; Educational institutions; Research institutes and laboratories; Venture capital firms; Financial markets; Government institutions. |

| | |
|---|---|
| KEY DETERMINANTS AFFECTING ECOSYSTEM PERFORMANCE | Resources, governance, strategy and leadership, organizational culture, technology; Interaction between ecosystem actors |
| MICRO LEVEL IMPACT | Value and innovation creation; The level of firms' productivity; Influence to innovation performance. |
| MACRO LEVEL IMPACT | Enhance competitiveness; Effect on innovation index |
| ENVIRONMENT | From local to global; Inter-organizational, political, economic, and technological environment. |

**Source: Adopted from: Pilinkienė and Mačiulis (2014)**

### 2.7.1. The Geographic Aspect of Innovation Ecosystems

It is believed that with the development of technology and the improvement of information flow among participants of the economy in general, the tendency of geographic concentration of economic actors in the process of innovation to become less. However, as Cortight and Mayer (2002); Feldman (2001) find, this tendency toward spatial concentration has become more marked over time, not less. Furthermore, as Asheim and Gertler (2005) explain, the geography is fundamental, not incidental to the innovation process itself: that one simply cannot understand innovation properly if one does not appreciate the central role of spatial

proximity and concentration in this process. Generally, an entrepreneurial and innovation ecosystem emerges in locations that have place-specific assets/attributes (Herrera et al., 2018). By analysing the literature on innovation, we can notice that innovation ecosystems have been seen in the scope of geographical aspect, meaning those regions, districts, or areas where the percentage of innovation is higher than in other areas. As in other fields of studies, different authors see scientific events or processes from different perspectives. Leon (2013) tended to relativize the geographical bias to focus attention on one firm or group of them that share some common goals in a global sector or market challenges whereas they are linked or not to one specific territory. Additionally, it was Torre (2013) that introduced Temporary Geographical Proximity (TGP) as a way to cope with the technological changes, according to the author this term constitutes one form of geographical proximity that enables actors to temporarily interact face-to-face with each other, and a large part of the information and knowledge that are necessary for production or innovation activities to be transferred from a distance, through telephone or Internet-mediated exchanges for example. However, face-to-face interaction cannot altogether be eliminated, and consequently, ICT cannot be considered a substitute for face-to-face relations (Torre, 2008).

On the other hand, as Asheim and Gertler (2005) mention, innovative activity is not uniformly distributed across the geographical landscape, indeed, the more knowledge-intensive the economic activity, the more geographically clustered it tends to be, like biotechnology or financial services, which have become ever more tightly clustered in a small number of major centers despite the attempts of many other places to attract their activities in these sectors.

The emotional closeness between actors (Coughlan, 2014), and the benefits of innovation ecosystem companies from their locations and collaborations (Almeida and Kogut, 1999) are some of the profits that come from the geographic concentration of companies.

The geographic-based development policies lack of understanding the social connections among the economic actors, so the innovation ecosystem thinking evolves those policies and embraces the social dimensions as a very important tool of sustainable development. Fostering networking assets and platforms of collaboration spaces are some of the policies that innovation ecosystem builders should be the focus on.

## 2.8. Innovation Ecosystem Actors

Adner and Kapoor (2010) mention that the strategy and the innovation literature have traditionally dealt with the innovation challenges that are mainly faced by the focal firm, rather than the whole ecosystem, Valkokari (2015) agrees with it, he seeks to have a more focused approach to, for example, a certain set of actors within the whole ecosystem to get a more in-depth view about the processes and interactions taking place. In this research, it is used the same approach. There have been pre-selected the innovation ecosystem actors to study their impact in the specified area of interest explained in the methodology part. Different scholars emphasize different actors of the innovation ecosystem. It is necessary to mention that the innovation ecosystem is not a static formation with fixed actors, on the contrary, it is a very dynamic form of organization, which is acclimatized based on the environment where it operates. Based on that, we can mention these innovation ecosystem actors: research institutions and universities, government, entrepreneurs, start-ups and other enterprises, venture capitalists, angel investors, incubators and accelerators, non-

government organizations, collaborative networks, innovators, vendors, financial network (Adner and Feiler, 2017; Clarysse et al., 2014; Gulati et al., 2012; Oksanen and Hautamaki, 2015; Pellikka and Ali-Vehmas, 2016; Talmar et al., 2018; Viitanen, 2016). During the process of literature review on the topic of innovation ecosystem actors, there have been found, various participants or actors. Different innovation ecosystems consist of different actors. This happens since the innovation ecosystems are dynamic formations that differ from each other. In the table below there have been emphasized the actors of the innovation ecosystem mentioned by other researchers. For more information, see Table 3.

*Table 3. Innovation Ecosystem Actors*

| **Innovation Ecosystem Actor** | **Author / Source** |
|---|---|
| Research Institutions & Universities | Clarysse et al., (2014); Guerrero et al. (2016); Mason and Brown, (2014); Oksanen and Hautamaki, (2015); Pellikka and Ali-Vehmas, (2016); Striteska & Prokop (2020); Valkokari, (2015) |
| Government | Corrente el al. (2008); Pellikka and Ali-Vehmas, (2016), Albros-Garrigos & Barrera (2011) |
| Financial Institutions | Corrente el al. (2008); Mason and Brown, (2014); Guerrero et al. (2016); Claryssen et al., (2014) |
| Start-ups & Enterprises | Gulati et al., (2012); Shane, (2009); Striteska & Prokop (2020); Talmar et al., (2018) Viitanen, (2016) |
| NGOs & Development Agencies | Jackson, (2011); Viitanen, (2016); Wallner and Menrad (2011) |
| Incubators & Accelerators | Miller and Bound (2011); Gertler, (2003); Hughes, Ireland & Morgan (2007); Viitanen, (2016) |
| Social & Cultural Norms | Carayannis and Campbell (2009); Corrente el al. (2008); Hwang and Horowitt (2012); Wallner and Menrad (2011) |
| Angel Investors | Guerrero et al. (2016); Mason and Brown (2014) |
| Venture Capitalists | Adner and Feiler, (2017); Guerrero et al. (2016); Mason and Brown, (2014); Mcdade & Malecki, (1997); Miller and Bound (2011); Norton, (2001) |

| | |
|---|---|
| Private Equity Firms | Porter (2000) |
| Professionals | Cohen (2006); Jackson (2011); Neck et al. (2004); Roper and Hart, (2013); Valkokari, (2015) |
| Market Facilitators & Intermediaries | Asheim and Isaksen, (2002); Cooke, (2001); Cooke et al, (1997); Storper and Venables (2004) |

**Source: Author literature research and elaboration**

Since there are different numbers and sets of actors in innovation ecosystems (as seen in table 3), in the graph below there have been preselected the actors that exist in the respective innovation ecosystem of this research study. This selection process has been conducted to have better and more reliable statistics results in the methodology part. There are very important actors that facilitate and help businesses in an innovation ecosystem like, angel investors, venture capitalists, market facilitators and intermediaries, professionals in ecosystem building, but the reason for not choosing these very important actors are because they do not exist in the respective innovation ecosystem. The financial market in Kosovo is in the emerging phase, this explains the lack of these actors. The composition of this more advanced financial and market formation is very hard to be found in emerging financial markets like Kosovo. Nevertheless, as seen in this study, the Innovation Ecosystem in the ICT sector in Kosovo is a very promising market. As Murati-Leka (2018) explains, the absorptive capacity of knowledge and new technologies is more emphasized in the ICT companies in Kosovo; the incoming set of actors like mentioned above is very likely to happen in the near future of the ICT innovation ecosystem in Kosovo.

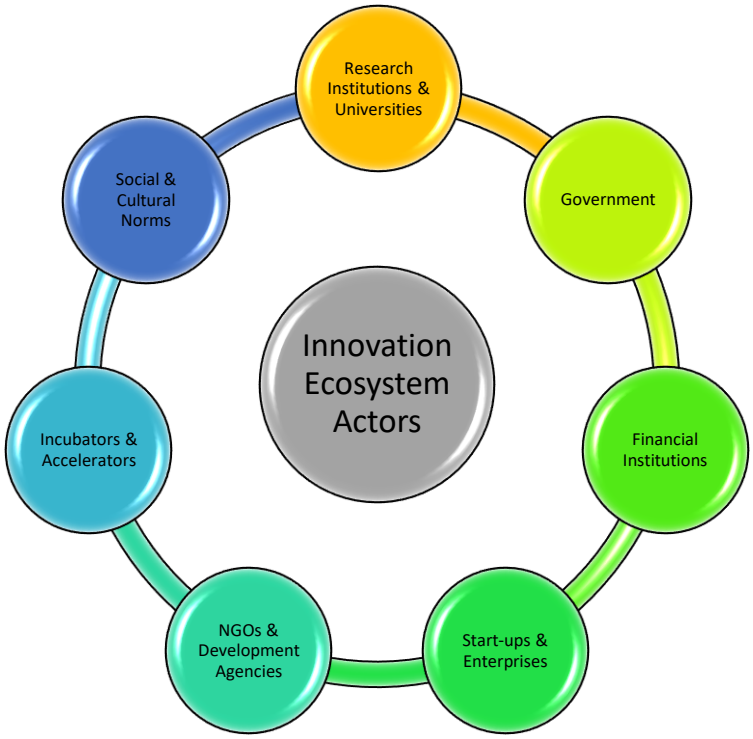



*Figure 5. Innovation Ecosystem Actors*

**Source: Author elaboration**

Below, can be found a brief explanation of each preselected actor of the innovation ecosystem.

### 2.8.1. Research Institutions & Universities

Research institutions and universities are very important actors in the innovation ecosystem due to their progressive role in knowledge creation. Furthermore, they tend to be cooperation partners of governments trying enrichment of research and innovation in their economies. Research institutions with special emphasis on universities provide training and formal tertiary education which means they are important actors for generating educating

human capital capable to cope with the needs of maintaining a successful innovation ecosystem. As Spigel (2017) argues, the universities provide benefits and resources to entrepreneurs of innovation ecosystems.

### 2.8.2. Government

The government plays a crucial role in the overall success of the innovation ecosystem. As Corrente et al. (2008) explained, government policy and the regulatory framework are found to be likely to accelerate the starting and scaling phases of start-up companies. Its role can be seen in three prisms, promoting innovation, ensuring infrastructure, envisioning, and financing 'entrepreneurship'. In the first prism, the government supports policies and regulations to create friendly environment tax incentives for start-ups that enable innovations and scientific research. In the second prism, governments may provide the technological and physical needed infrastructure for the participant of the innovation ecosystem. In the third prism, governments can finance and envision the creation of new fields of economic divisions, and then act as a partner to inventors to scale innovations and generate a sustainable impact on society.

Additionally, governments are becoming increasingly interested in fostering a favorable atmosphere for entrepreneurship climate through tax rates and other incentives, also by providing other types of financial support and eliminating bureaucratic procedures toward business creation, such as applying for permits and licenses (Porter 1998; Siegel et al. 2003).

Moreover, government policy and the regulations are found to be related to the birth and scaling phases of the firm, there are policymakers that maintain ecosystems; they shape

the regional dynamics, and they can also provide smart funding that amplifies private investments (Corrente el al., 2008).

### 2.8.3. Financial Institutions

Financial institutions have become a very important integrative part of innovation ecosystems, enabling other actors to expel their businesses. As Iansiti & Levien (2004) mention, ecosystems hence extend the concept of a value chain to that of a system that includes any organization that contributes to the shared offering in some way. This means that the ecosystem mindset organization of participants may include those from the outer traditional value chain of suppliers and distributors, like financial institutions.

Moreover, within the innovation ecosystem, the financial network that supports the actors (both companies and research institutes and other technology developers) has recently been identified as one of the key success factors (Claryssen et al., 2014).

### 2.8.4. Start-ups & Enterprises

Start-ups are very important actors in innovation ecosystems. They are the generators of new ideas, inventions, etc. They represent a powerful engine of new ideas. They are new businesses, very adaptive, and seeking funds to finance their innovative ideas. Comparing to big corporations, they have the ability to create new solutions that others may disregard. This makes them bring values of healthy competition and creativity into an innovation ecosystem. Start-ups are positively related to job creation (Fritsch, 2013). Besides, as investments Corrente et al., (2008) explains, start-ups generate innovation, the exploration of new markets, and define the way for the jobs of the future and are the most promising possibilities for inventors to exploit their knowledge (Audretsch 1995; Klepper 2009).

### 2.8.5. NGOs & Development Agencies

NGOs & Development agencies are an important integrative part of an innovation ecosystem. They tend to be more aware of social, environmental, and cultural topics. Development agencies finance innovative paths to address the social, cultural, and economic challenges of society. They mostly finance early-stage innovators and start-ups with seed capital to develop and commercialize their ideas. Nowadays, developing agencies are exploring to strengthen their role in building connectivity and the capacity of other actors of the innovation ecosystem. On the other hand, NGOs play a crucial role in conducting researches that have a more social, environmental, and cultural connotation. According to Wallner and Menrad (2011), NGOs can be coordinators between the stakeholders and link similar initiatives in the outside world of an innovation ecosystem.

### 2.8.6. Incubators & Accelerators

Incubators and accelerators play a crucial role in innovation enabling and facilitating by providing physical and professional support for start-ups. This support includes physical spaces for innovators and start-ups, equipment, and a shared technology platform. Besides physical infrastructure, incubators and accelerators provide also professional support like technical advice, mentoring, legal consulting, marketing help, and general guidance of business support. An important impact of these programs is to foster entrepreneurial communities, which in turn, facilitate tacit knowledge sharing (Gertler, 2003).

In practice, besides private incubators, we can find public incubators, which commonly involves universities, and are a vital source of innovation and knowledge derived from universities. On the other hand, private sector business accelerator programs are established to help nurture the fledgling ventures (Miller and Bound, 2011). Accelerators are usually located in physical premises. However, some of them are virtual. They help new businesses to have access to public support like access to finance, or innovation and entrepreneurship support. In this way, they help star-ups to connect more easily to other actors of the innovation ecosystem, like angel investors, private equity firms, venture capitalists, and others.

### 2.8.7. Social & Cultural Norms

Most existing innovation system models include culture as a factor; but they do not see it as a variable factor or do not provide the means to influence it (Wallner and Menrad, 2011). The results show that the most relevant entrepreneurial ecosystem factors enabling the birth and activity of high-growth start-ups, and so affecting technology, economy, and society, can be identified in cultural and social norms, government programs, and internal market dynamics (Corrente el al., 2008). As Carayannis and Campbell (2009) highlight the proper 'innovation culture' is key for promoting an advanced knowledge-based economy.

Culture and social norms are essential components of an innovation ecosystem, since the innovation process in an attribute of culture. Innovativeness and culture are emerging qualities of social systems, they cannot be created, but they can be transformed by purposeful action (Wallner and Menrad, 2011). Furthermore, Spigel (2017) has argued that an entrepreneurial ecosystem is composed of 11 cultural, social, and material attributes that provide benefits and resources to entrepreneurs. In the end, Corrente et al., (2008) suggest

policymakers invest in disseminating entrepreneurial culture, as a way to improve the innovation ecosystem. Mercan & Göktaş (2011) explain that the culture to innovate is another structural component that is expected to foster innovative activity among an innovation ecosystem.

In identifying the factors necessary to replicate Silicon Valley – the best example of an innovation ecosystem, Hwang and Horowitt (2012) indicate the importance of culture in which uncontrolled interactions normally occur between actors, capital, ideas, beliefs, and opportunities, which are the fundamental elements in any successful innovation ecosystem. These authors take a metaphor of rainforest to explain an innovation ecosystem, in which the process of innovation is a casual or unplanned event – a typical feature of the rainforest's ecology – which on the other hand, is the opposite of industrial economy – which is characterized with a programmed or planned production.

### 2.7.8. The Heptagon Model of IE Actors

In the following figure, the author of the paper has designed a model that can describe in graphical form the Correlation that exist between the actors within the Innovation Ecosystem researched in this study. Through this graphical form, the author tries to build a model that can be applicable to further studies in this field. Each angel of the heptagon represent an Innovation Ecosystem Actor, while the inner segments of the heptagon represents the correlation that exist between innovation ecosystem actors.

The Heptagon Cooperation Model will be enriched with metrics in the following chapters, after the statistical analysis has been made. The inner segments with take values to show the correlation that exist between the IE Actors. Furthermore, this model will be

extended to a wider form to give the impact that these actors will have on the Overall Firm Innovation Performance.

The Heptagon Cooperation Model of IE Actors has been designed by the author of the paper as an effective tool on conducting the Mapping of an Innovation Ecosystem. This model may be used by other authors in this field of study.

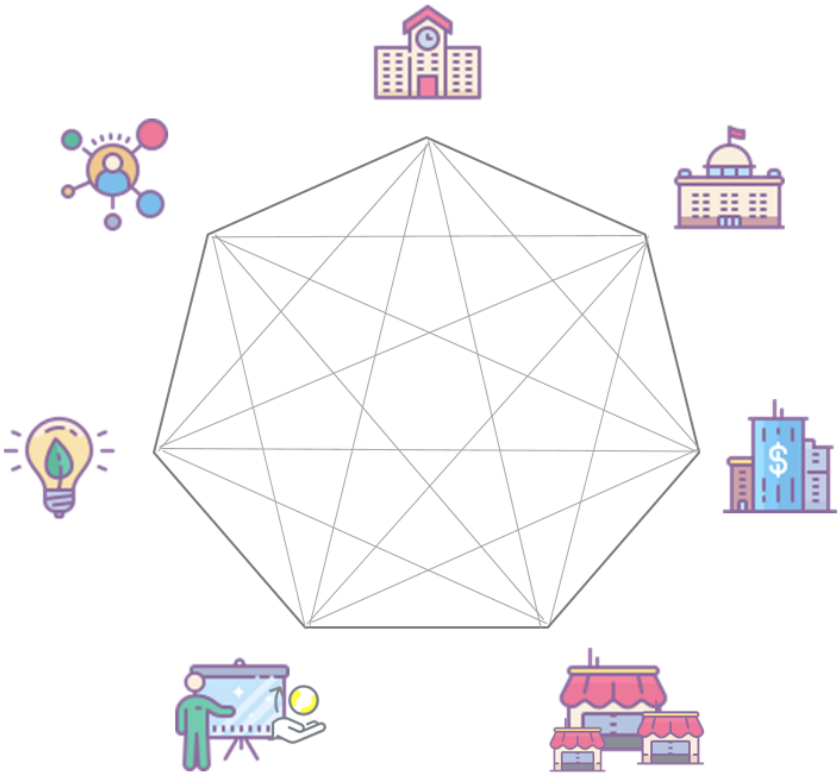


*Figure 6. The Heptagon Cooperation Model of IE Actors*

**Source: Candidate**

## 2.9. Conceptual Framework

In the previous chapters, there has been explained the general idea of concepts and variables that will be incorporated in order to research the correlation between Innovation Ecosystem actors and overall firm innovative performance. The conceptual framework of this research exemplifies as follows (Figure 7).

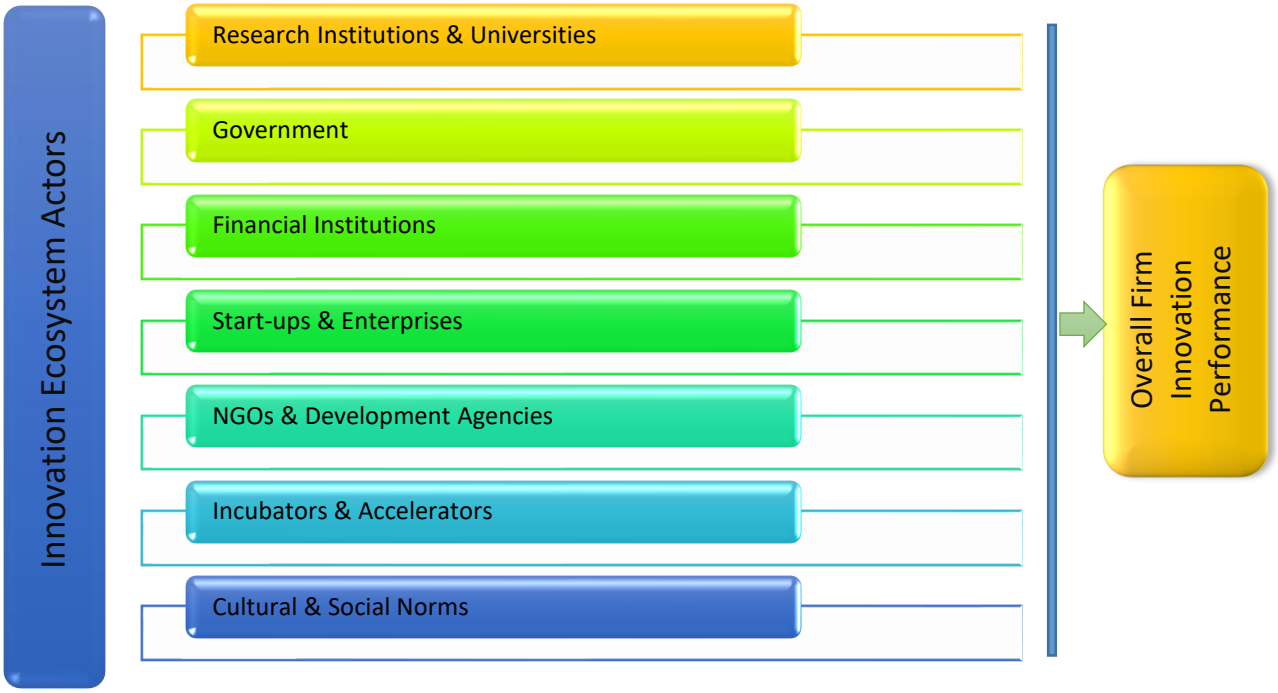



*Figure 7. Conceptual Framework of the study*

**Source: Candidate**

## 2.10. From Innovative Ecosystem to Intelligent Innovative Ecosystem

Globalization as an era, technological revolution as a mechanism, increased volume and circulation of information as a result, and the discovery of technological innovations like

artificial intelligence as a tool, has made our lives more dynamic but also more efficient. These technological inventions have not remained marginalized only in the technological sector; on the contrary, their application has found wide use in the field of economics, respectively business, social life, medicine, etc.

As a result, our lives have become more intelligent, where computers mimic human intelligence, and thus many processes, such as big data processing become much easier and faster. Even innovative ecosystems are affected by these radical changes, thus shifting from innovative ecosystems to innovative intelligent ecosystems.

## 2.10.1. The future Tools of Innovation Ecosystem

From the elaborations in the previous chapters, we can come to a logical conclusion that the whole essence of the emergence and development of the innovation ecosystem is in creating a form of cooperation and co-evolution between actors in order to bring innovation and in this form also finding new ways of survival in today's dynamic environment.

Two of the tools we can mention are Artificial Intelligence (AI) and Collective Intelligence (CI) as new forms that should be incorporated into the innovative ecosystem to help the participants to be as effective as possible in intelligently achieving their missions.

### 2.10.1.1. Collective Intelligence (CI)

The term 'collective intelligence' has been introduced since 1980', elaborated in different fields like, biology, psychology, neuroscience, economics, etc., described as a group of individuals acting collectively in ways that seem intelligent (Malone et al., 2009). Furthermore, with the rapid development of technology, and its integration into the business

world, this concept has been evolved. According to (Malone and Bernstein, 2015) the collective intelligence may be described as interconnected groups of people and computers, collectively doing intelligent things. The application of collective intelligence in the innovation ecosystem functions may be seen as a way of improving the overall output. As Levy and Bononno (1997) explain, collective intelligence is a form of universally distributed intelligence, constantly enhanced, coordinated in real-time, and resulting in the effective mobilization of skills. Collective intelligence has gained tremendous attention among scholars in the past few years. This has happened as a result of the exponential development of information technology being used in our daily lives. As Malone and Bernstein (2015) explain, many scientific disciplines, including neuroscience, economics, and biology are doing indispensable discoveries in explaining how groups of individuals can collectively do intelligent things. Furthermore, as Elia and Passiante (2020) find, the arising technology paradigm is leveraging the potential of collaboration and collective intelligence to design and launch more robust and sustainable entrepreneurial initiatives.

The successful application of collective intelligence into practice, especially in the business world, needs some preconditions. As Mulgan (2018) emphasizes, the actors need to complement, complete, and interact together, thus, allowing for collective intelligence emergence and orchestration. According to Gonzales et al., (2019), collective intelligence has been also seen as an economizing tool, since the members can think more quickly and efficiently together. Besides, Komninos (2006) explained the architecture of intelligent cities; in his work, he came to the conclusion that institutions manage intangible mechanisms of social capital and collective intelligence that guide the matching of individual capabilities and

skills and actualize the complex processes of innovation within the clusters of the city, or within innovation ecosystem explored in this study.

In a conclusion, the integration of collective intelligence thinking within the innovation ecosystem architecture is a necessary thing to be implemented. Considering the megatrends of technological and social changes, the tremendous amount of data analysis among the business world, collective intelligence should be seen as a way of surviving and operating effectively and efficiently in this dynamic world.

#### 2.10.1.2. Artificial Intelligence (AI)

Countries around the world are concentrating their efforts on pivotal technologies like artificial intelligence to shape their prospect economic development and sustainability as a way to cope with globalization and technological changes. The prompt technological advancement implies that the transformative substitutions will come rapidly. The increased amount of data analysis has put artificial intelligence into unprecedented inevitability levels. However, what do we understand with artificial intelligence? According to Plant (2011), artificial intelligence is the study and implementation of techniques that allow actions requiring intelligence on the part of a human to be performed on computational devices. Furthermore, Dwivedi, et al., (2019), define artificial intelligence as a transformative potential for the augmentation and potential replacement of human tasks and activities within a wide range of industrial, intellectual, and social applications. The technology in present-days has a powerful impact on business creation and operation. As explained by Cohen and Kharas (2018), the ability to collect and analyze vast amounts of data rapidly, and generate deeper

insights to inform decision-making is already having a transformative effect on the development sector, with the significant advantage of shortening the feedback loop between monitoring and implementation to achieve better results. As explained by Fenwick et al., (2018), the enormous increase in computational power, the breakthrough of "Internet of Things" applications, and the further development of smart machines will only accelerate AI's development and global adoption. Implementing a working response to new artificial intelligence technologies is challenging for any business looking to practice artificial intelligence into their daily routine. Fenwick et al., (2018), proposed two strategies for meeting the artificial challenges: 'the dynamic regulation' and 'innovation ecosystems' strategy. According to the authors, innovation ecosystems are most effective when they afford opportunities for creative partnership between well-established corporations and AI-focused start-ups. The resulting synergies between these strategies therefore can provide a jurisdiction with a competitive edge in becoming a regional hub for AI-related activity, Fenwick et al., (2018).

Another concern with the rapid development of technology is the adaption of people to these rapid advances in technology. As claimed in Horizon Europe (2018) in order to improve the quality and efficiency of national innovation systems is to "ensure that European citizens get supported through what will be fast and, for some, turbulent transition driven by innovation, digitization and global megatrends such as artificial intelligence and the circular economy".

Furthermore, in the scope of adopting new forms of technology in the business world, and expanding the cross-industry cooperation, Chen and Mei (2018) proposes HI (Holistic Intelligence) as a total and collaborative innovation driven by strategic vision. According to them, in the era of globalization and the fourth industrial revolution, HI accelerates the

promotion of industrial internet, quantum communication, artificial intelligence, and health care through strategic design by connecting industries, enterprises, and innovators at the national level, Chen and Mei (2018).

Considering the implications of the above mentioned, the final objective is to prepare regional ecosystems for a world with a very different level of development and artificial intelligence automation since artificial intelligence has the potential to help people, institutions, organizations, and businesses face efficiently and effectively solve problems.

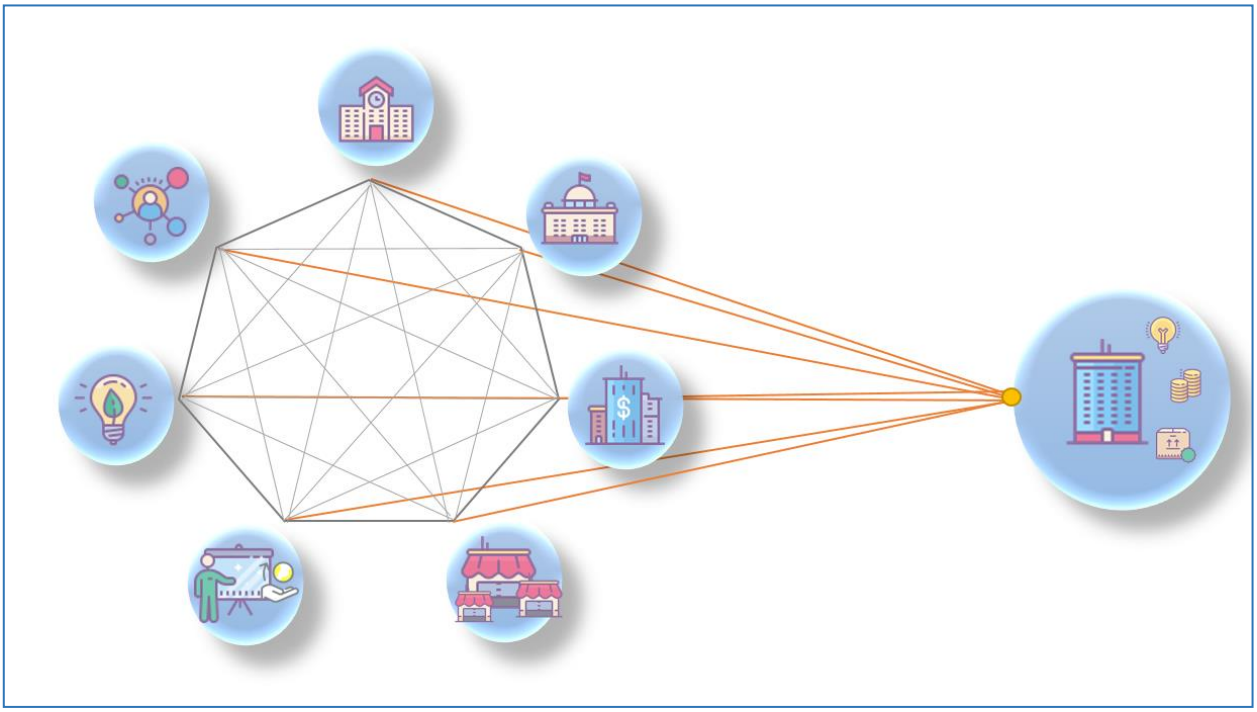
## 2.11. Profiling the ICT Innovation Ecosystem in Kosovo

The domestic market of Kosovo is still small-scaled and undeveloped. Consequently, Kosovo's innovation and entrepreneurial ecosystem are still in its initiation phase. Therefore, this ecosystem suffers from the insufficiency of the branding position of the ICT industry. However, on the way to the development and positioning of the Kosovo ICT industry, we can find some advantages that will be able to help the development of the innovative ecosystem in Kosovo.

Initially, the Government of Kosovo, through the Kosovo IT Strategy, has demonstrated and recognized the crucial role of the ICT industry in its social and economic development. Secondly, the overall demographic situation, which is characterized by a young population, in the combinatorial with the increased interest among students to study IT profiles, gives great hopes for prosperity and advancement of this sector in Kosovo.

Through this scientific research, it is being attempted to be achieved the collection of all relevant information and engagement in mapping the ICT innovation ecosystem in Kosovo. The final product of this research should be the closure of all the gaps that will allow us to have a clear picture of this ecosystem. To the best of my knowledge, there are no efforts of mapping the ICT innovation ecosystem in Kosovo. In the following sections, a brief description of the ICT sector will be given, and the state of innovation and entrepreneurship in Kosovo will be briefly described. In the figure below, it is elaborated the heptagonal cooperation-influence model of innovation ecosystem actors on a firm's innovation and new product development, which is the main purpose of this research. This model is designed by the author of this paper as an attempt to map the ICT sector in Kosovo. The segments of the heptagon describe the cooperative relationships among Innovation Ecosystem Actors of the ICT Sector, while the outer lines of the heptagon describe the influence relationship of Innovation Ecosystem Actors on firm's innovation and new product development. The seven heptagon's angels (IE actors) chosen in this model are research institutions and universities, government, financial institutions, start-ups and enterprises, NGOs and development agencies, incubators and accelerators, social and cultural norms.

*Figure 8. The heptagonal cooperation-influence model of innovation ecosystem actors on firm's innovation and new product development*



**Source: Candidate**

### 2.11.1. The ICT Sector in Kosovo

Information and communication technology (ICT) provides a possibility for direct interaction between users and gives access to immense quantities of information (Thomée et al., 2007) and brings new forms to store, process, distribute, and exchange information both within companies and with customers and suppliers in the supply chain (Scarsi and Cepolina, 2016). In this way, ICT has been seen as a tool that facilitates the transformative processes in the business world. As Gërguri-Rashiti et al., (2015) mention, in transition economies ICT represents the way businesses communicate and conduct activities in the global marketplace. However, seeing in the broader picture, ICT constitutes a very important economic sector itself.

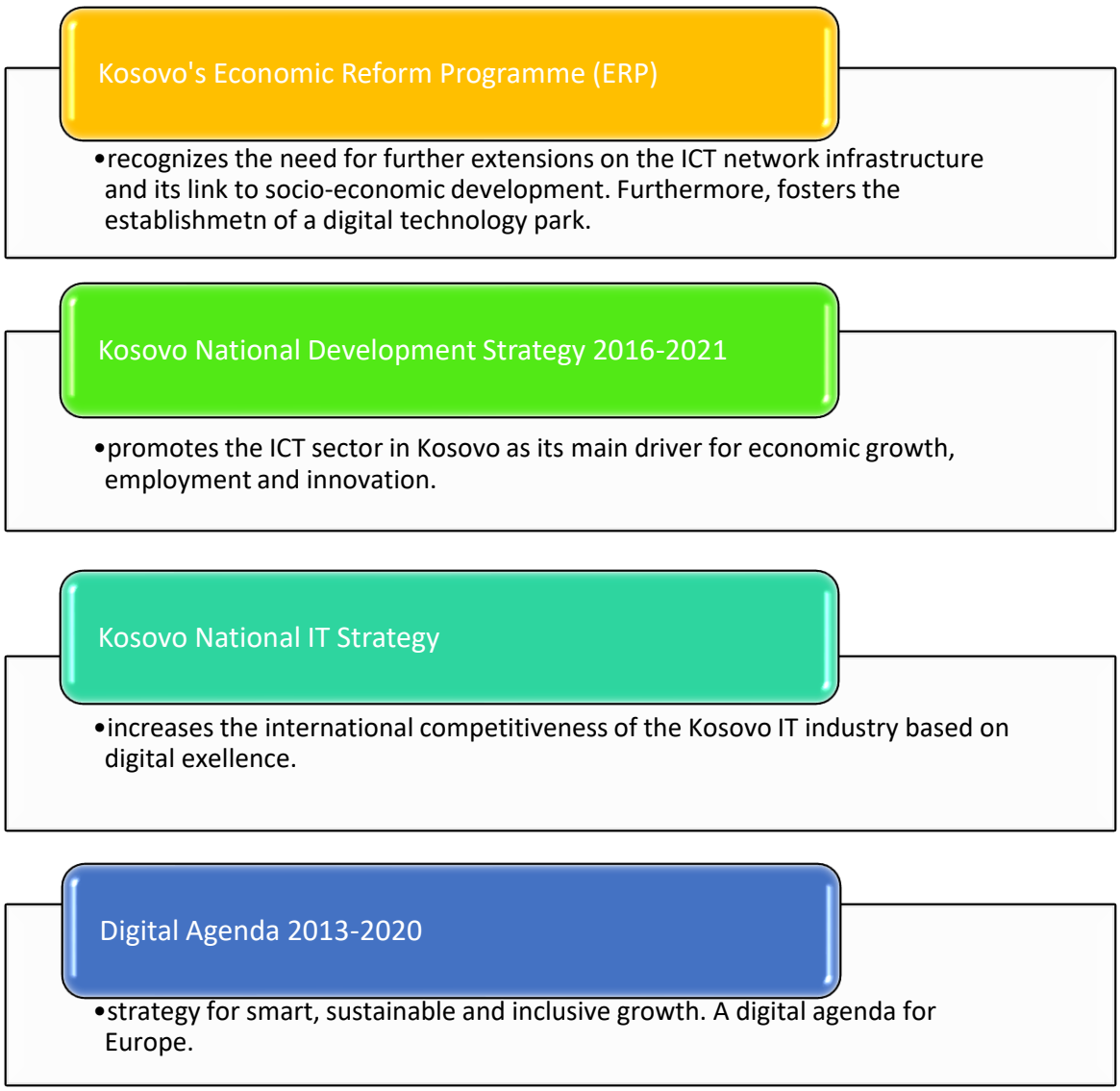
The state of Kosovo is new in its institutional and state-forming constitution. Consequently, its economy is fragile and characterized by a prolonged period of transition. However, different economic sectors on an individual basis have managed to keep pace with global trends. One of them is the ICT sector.

Since ICT is a sector that integrates with the outside world easier, we can say that this sector is very promising for countries like Kosovo, with a young population but also with high unemployment, especially among youth. According to the Labour Force Survey of the Agency of Statistics of Kosovo, the most pronounced group of unemployment was the group rate of 15-24-year-olds that has reached 49.4 percent in 2019 (ASK, Labour Force Survey, 2019). Furthermore, based on World Bank WDI indicators, the share of ICT-related exports to total service exports in Kosovo for the period 2007-2017 was 9.75% (World Bank Indicators-International Monetary Fund, Balance of Payments Statistics Yearbook and data files – author calculations).

Moreover, in 2013, the Government of Kosovo has officially declared the IT Industry as a high-priority sector for economic development and prosperity. Furthermore, following this initiative, the Government of Kosovo has developed a national strategy to promote the ICT sector in Kosovo. The Kosovo IT Strategy was developed in 2016 and in that time, it has foreseen that by 2020, ICT to become the main driver for economic growth, employment, and innovation (Kosovo IT Strategy, 2016). The vision of this strategy was to promote the digital transformation and support Kosovo to become a knowledge-based economy through enhancing its international competitiveness based on digital excellence. In the following figure, there have been explained briefly the national strategic documents on ICT and,

government policies and regulations. Additionally, the legislation of Kosovo that embodies the ICT sector is mostly harmonized with the relevant EU legislation.

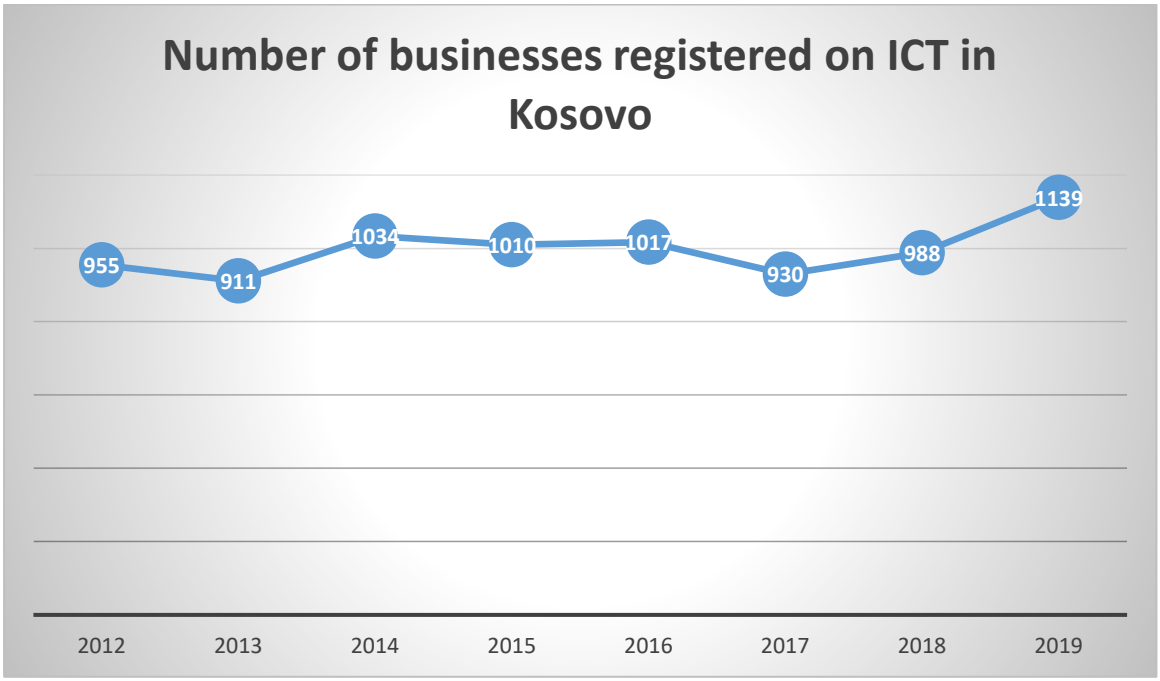
*Figure 9. National Strategic Documents and Policies on ICT –Kosovo*




**Source: Adapted from Instrument for Pre-Accession Assistance (IPA II) 2014–2020. European Commission.**

The number of businesses registered in the field of ICT in Kosovo, over the years has increased. This shows a positive trend to strengthen the impact of this sector on the economic development of the country. According to the Kosovo Agency of Statistics (2020), the number of businesses registered in the economic sector of information and communication technologies in 2019 was 621. In the graph below, we can see the registered businesses in information and communication technologies in Kosovo in the period 2012-2019.

*Figure 10. Number of businesses registered on ICT in Kosovo 2012-2019*



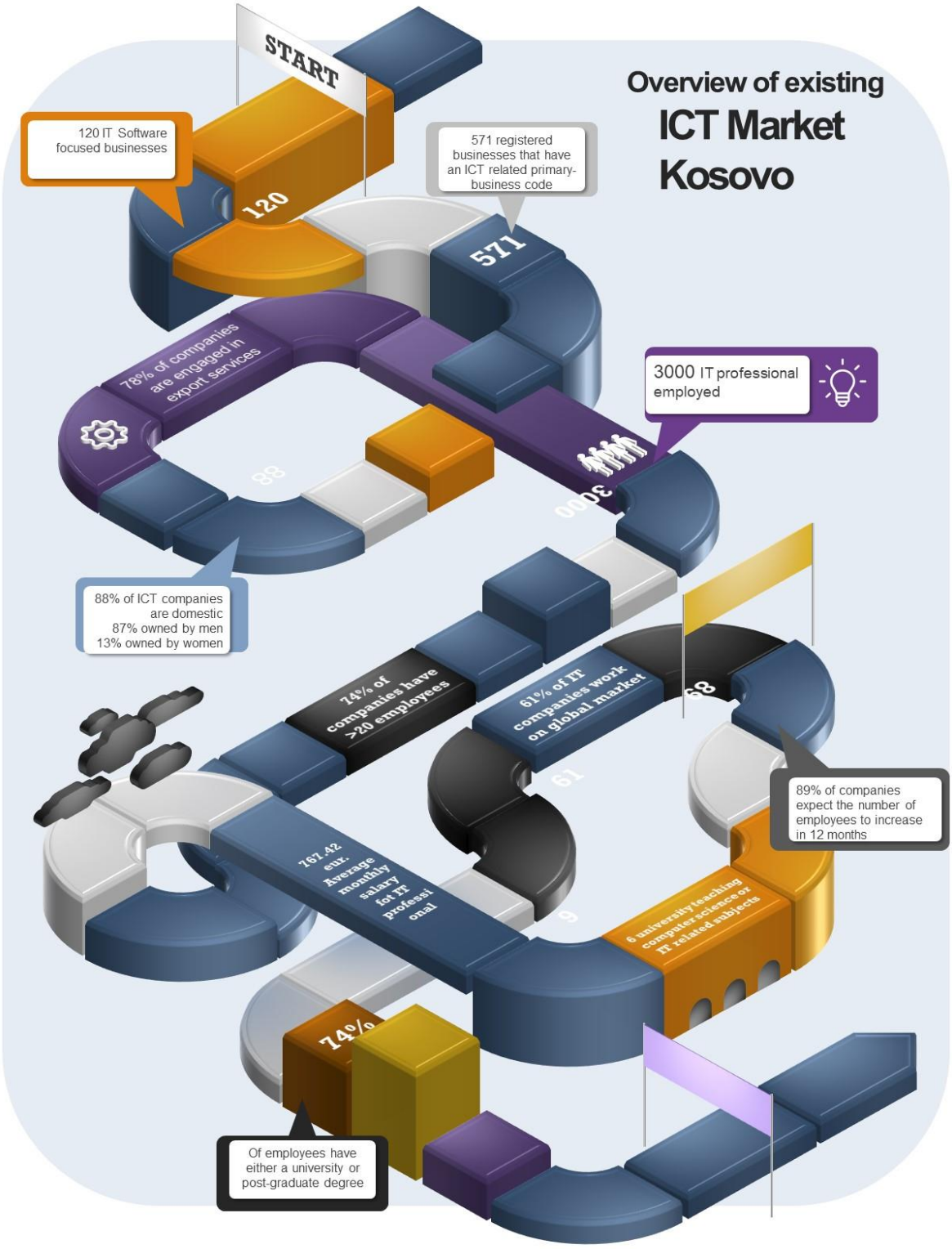

**Source: KAS - Statistical Yearbook of the Republic of Kosovo, 2020**

The ICT industry as an economic sector has a great potential to drive Kosovo's economic development since this sector is not characterized by extensive physical input demands or high mobility of the workforce. Therefore, it is a promising area for job creation, export enhancement, and income generation for Kosovars.

Hence, Kosovo's IT sector is Micro Small and Medium Enterprises (MSME) dominated, which results in a lack of economies of scale. According to IT Barometer for Kosovo (2018), 74% of ICT companies have less than 20 employees. There are approximately 120 IT software businesses in Kosovo that employ around 3,000 IT professional programmers, presenting the IT sector as an important employment factor (IT Barometer for Kosovo, 2018). Furthermore, according to the Statistical Yearbook of Kosovo Agency of Statistics (2020), access to the internet across Kosovo has grown in the last years, making it one of the countries with the highest percentage of internet access in households (93.2%).

In the information graphic - infographic below, it is given an overview of the existing ICT market in Kosovo, through some data taken from the Kosovo IT Barometer (2018), summarized and visualized by the author. This choice of data visualization was made in order to facilitate the understanding of the information that the author wanted to include in order to give a clearer picture of the situation of the ICT sector in Kosovo. As Smiciklas, (2012) claims, infographics (abbreviated from 'information graphic') represent 'the visualization of data or ideas that tries to convey complex information to an audience in a manner that can be quickly consumed and easily understood'.

*Figure 11. Infographic about the existing ICT market in Kosovo*

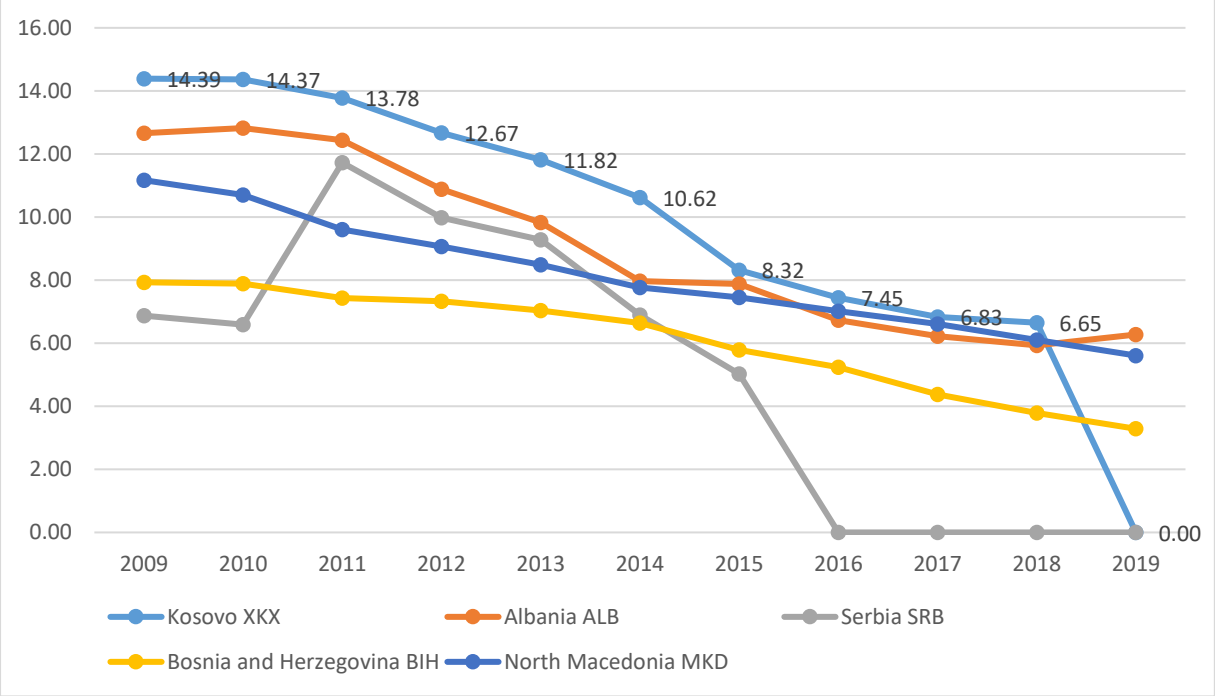



Author Illustration

Source: STIKK (2018), Kosovo IT Barometer, Final Report

Like any emerging market, Kosovo's financial market is not advanced enough to offer more advanced and facilitative service packages for new businesses, like venture capital financing, angel investors, and private equity firms. The banking sector in Kosovo is not an attractive and supporting actor due to businesses, especially start-ups. The high-interest rates loans and collateral are non-motivating factors of the collaboration of banking sectors and businesses in general. As shown in the figure below, Kosovo has the second-highest lending interest rate in the region, standing behind Albania (The World Bank Indicators, 2019).

*Figure 12. Kosovo and its neighbouring countries lending interest rate*

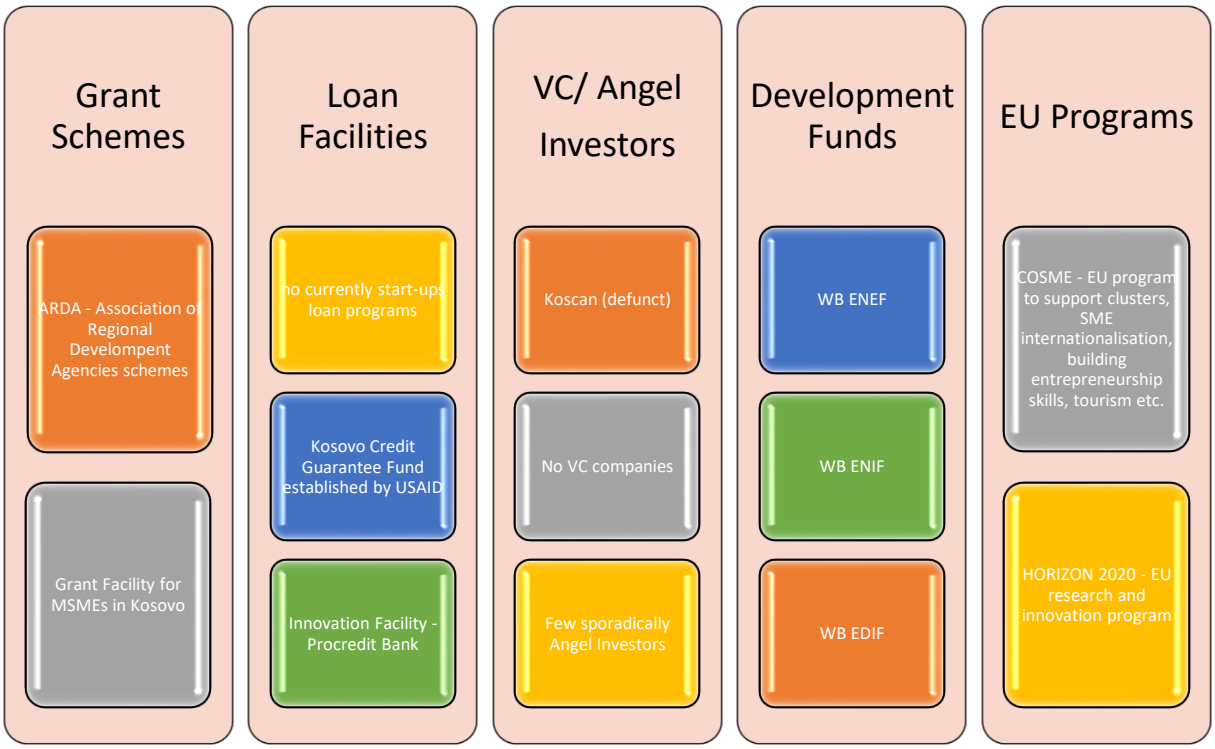



**Source: Data obtained from The World Bank (2019) online database, and the graph is processed in Excel Sheet by the author**

Lack of financing, or rather, high-interest bank loans is a serious obstacle for Kosovo's ICT industry growth and development. Furthermore, the absence of export financing schemes for Kosovar companies, especially those in the ICT industry is very challenging and non-supporting for the internationalization of the domestic market of Kosovo.

However, there can be found sporadically some funding sources that are focused on the ICT sector in Kosovo. In the figure below, there are listed the funding resources for ICT in Kosovo which are found in the Kosovo IT Strategy (2016) and **Instrument** for Pre-Accession Assistance (IPA II) 2014–2020, European Commission.

*Figure 13. Funding Sources of ICT Sector in Kosovo*




**Source: Adapted from Kosovo IT Strategy (2016); Instrument for Pre-Accession Assistance (IPA II) 2014–2020. Author elaboration**

Countries with strong national ICT industries are randomly better in attracting foreign direct investments (FDI). Thus, the promotion of Kosovo's ICT industry can help stimulate foreign investors and attract FDI, by improving its image, the technical and skill base, and the business climate, MTI (2017). As Sanfey et al. (2016) find, the Western Balkan is an attractive region for foreign direct investment based on its macroeconomic stability, strategic geographic position, low labour cost, and comparatively educated population.

From the briefly elaborated section about the ICT sector in Kosovo, with key statistical data highlighting and the institutional support that this sector enjoys, we can come to a logical conclusion that investing to organize organically the ICT sector into an innovative ecosystem would result in success. Furthermore, in the sections below, it will be discussed the designing of a sustainable cross-industry model of cooperation of an innovation ecosystem in Kosovo.

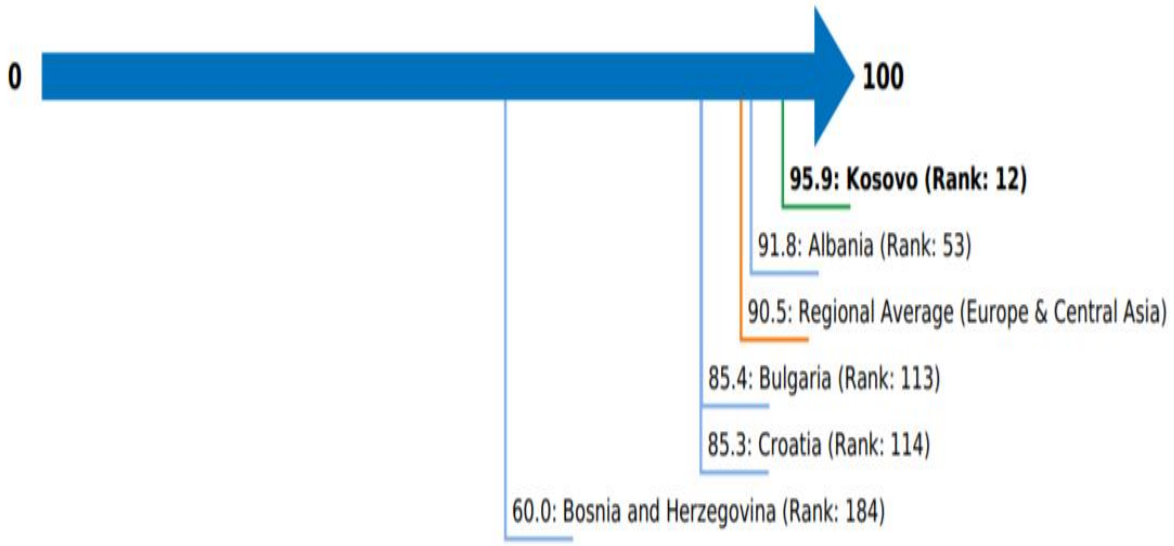
### 2.11.2. Innovation and Entrepreneurship in Kosovo

Innovation in business means bringing new products and services, new forms of organization, innovative processes, etc. However, to make these innovations in business there must be a supportive climate of entrepreneurship. The relationship between innovation and entrepreneurship is reciprocal. While innovation requires entrepreneurship supportive climate as a prerequisite, we can also say that entrepreneurship requires innovative entrepreneurial attempts. In conclusion, we can say that this connection is a dual co-evolvement cause-and-effect relationship. The most tangent point where entrepreneurship and innovation are mostly encountered, are SMEs. As Pullen et al., (2009) explain, SMEs search for new ways to introduce innovation activities to achieve growth. Likewise, plenty of scientific research has been conducted to explore the correlation between entrepreneurship, growth, and, knowledge. They have been evaluated both theoretically (Solow, 1956) and,

empirically (Nadiri, 1993). The authors have put the focus on entrepreneurship and innovation, with a special emphasis on the contribution of small firms in job creation and employment (Acemouglu et al., 2006; Audretsch, 1995; Birch, 1979). As Braunerhjelm (2010) explains, entrepreneurship is the main component of national advantage with eminent importance in enhancing rivalry and carrying out innovations that influence on stimulating economic growth. Schumpeter's theory also predicts that an increase in the number of entrepreneurs leads to an increase in economic growth (Schumpeter, 1942).

In the overall doing business ranking of 2020, Kosovo stands in the middle, ranking 57th, while in the topic of starting businesses, it performs much better, ranking 12th. In the figure below, we can see the ranking and scores of starting a business in Kosovo and the comparison to the regional average (World Bank Group, *Doing Business. Economy Profile, Kosovo* 2020)

*Figure 14. DB 2020 Starting a Business Score - Kosovo and Regional Average*




**Source: World Bank Group (2020)**

On the other hand, entrepreneurship in Kosovo can be identified with a marked degree of informality. The general finding is that 35.7 percent of sales are under-reported in Kosovo. Hence, the informal economy is relatively larger in Kosovo compared with neighboring countries (Williams et al.,2017) this happening because of a lack of vertical trust by entrepreneurs in the formal institutions which is a key explanation for the prevalence of sales under-reporting in Kosovo (Williams and Krasniqi, 2018). Regardless, the importance of entrepreneurship in the economic development of Kosovo is enormous representing the plurality of employment, income, and output, but with an emerging involvement of innovation as a driver for competitive advantage, among SMEs in Kosovo.

Vorley and Williams (2017) conducted an interesting study, they have tried to explain how policy seeks to improve resilience through entrepreneurial activity, besides they conclude that entrepreneurship in Kosovo is integral to promoting diversification and capacity building, by developing institutional arrangements to harness productive entrepreneurship and reduce informal economic activity. This study has been done to examine the economic performance of Kosovo and responsiveness to exogenous shocks.

Both economic theory and empirical studies suggest that innovation is a key driver of productivity and a mechanism of economic growth (Grossman and Helpman, 1994; Schumpeter, 1939). Focusing on innovation activities and the development of an innovation policy is relevant for Kosovo's economic development, as it would help domestic businesses increase their productivity, competitiveness, and export opportunities (OECD, 2013). The government of Kosovo puts special emphasis on entrepreneurship and innovation in its agenda. In the Kosovo IT Strategy (2016), precisely, in its Strategic Pillar 7, is emphasized the importance of entrepreneurship in Kosovo. The main objectives are to establish an

entrepreneurial ecosystem conducive to IT entrepreneurship and innovation and to promote IT entrepreneurship (Kosovo IT Strategy, 2016). Although, public sector-based research and innovation remain a problem in Kosovo. Based on the findings of the STIKK – INDEXKOSOVA, (2013), there is only very little public sector-based research and innovation activity in the IT sector due to lack of resources and constraints in terms of R&D capabilities which substantially limits the ability of universities and institutes to conduct more applied research in support of Kosovo's IT industry.

Innovation needs a business environment that is conducive to long-term investment in new activities (Della Croce et al., 2011). According to the finding of Richter and Racic (2013), many innovation-related issues are sector-specific, while industry associations may be the key to the facilitation of innovative activities in Kosovo. While some sectors, such as ICT, are well served by effective and sustainable industry associations, in many other sectors industry associations may formally exist, and are unable to provide much impetus to encourage the business development and innovation activities of their members (Richter and Racic, 2013).

As we can see, entrepreneurship and innovation are very important factors in Kosovo's economy, but they are still not well established. This requires the construction of communication networks between institutions and other relevant actors. These networks should build well-formed connecting bridges. The essence lies not only in the creation of interconnected networks, but also in their organic connections that give efficiency and effectiveness. In Kosovo, we can speak in proper names for sectors that stand better than others do in entrepreneurship and innovation, as is the case of the ICT sector. However, this should be expanded in order to give examples in other sectors as well. In the following section, a cross-industry cooperation model of a sustainable innovation ecosystem will be proposed

by the author of this paper as a way of providing assistance towards overall economic development.

### 2.11.3. Cross-industry Cooperation Model of a Sustainable Innovation Ecosystem

Due to global trends and technological advances, the cooperation of the ICT innovation ecosystem with other sectors may go beyond simple cross-sectoral cooperation. This is due to the nature of this sector. While the ICT sector can build lines of cooperation with other sectors such as agriculture, medicine, tourism, and/or military, it can also become an integral part of these sectors, as a form of their digitalization. In the figure below, the 'heptagon model of innovation ecosystem actors' (see figure 7) is expanded to explain this type of cross-industry cooperation model. While some of the angels of the heptagons of the cross-cooperation model totally overlap (due to the same actor, like government, universities, financial institutions, or culture and social norms), some angels of the heptagons complement each other (like incubators and accelerators, NGOs and development agencies), the others might find a tangent point or differs totally (start-ups and enterprises of different sectors).

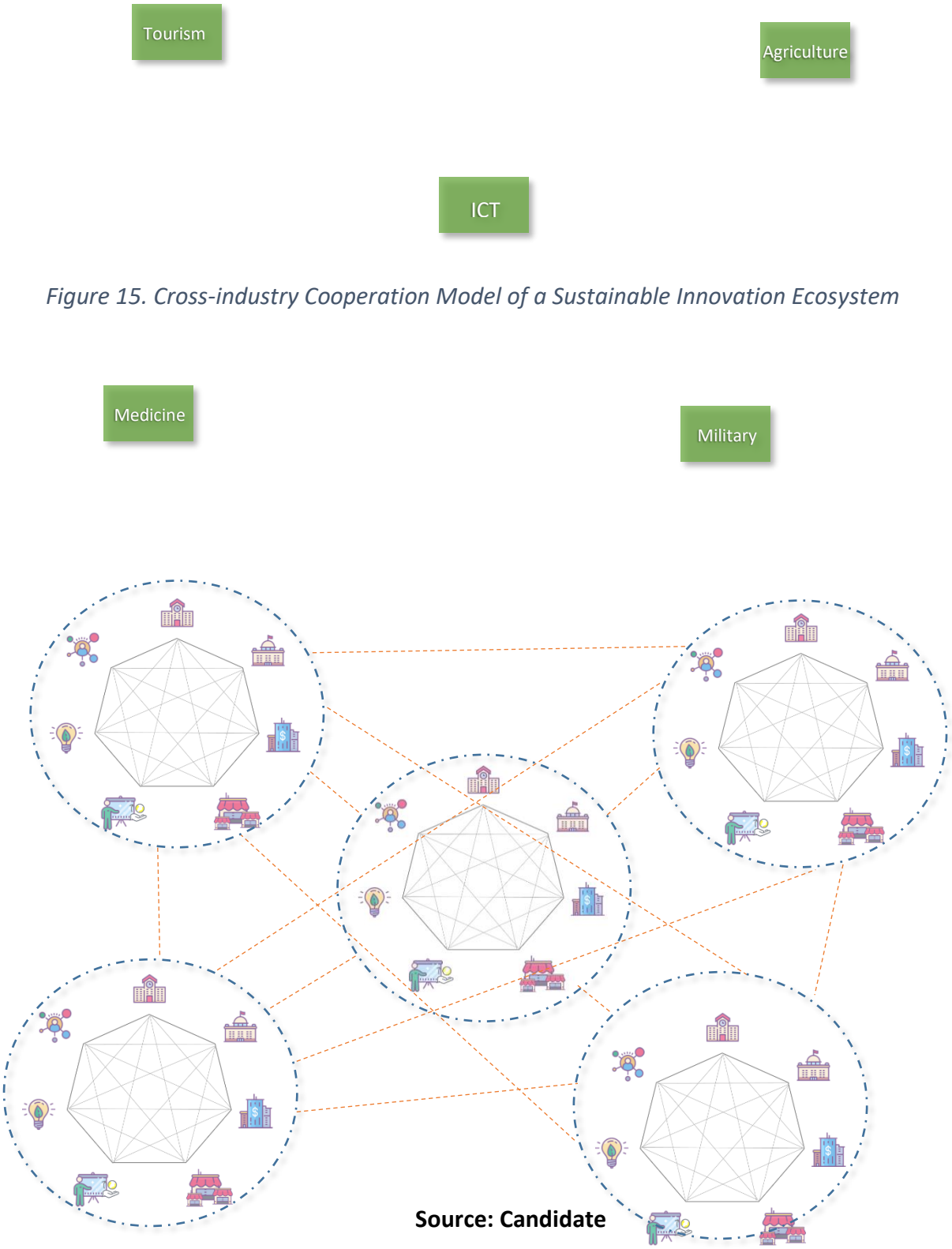



*Figure 15. Cross-industry Cooperation Model of a Sustainable Innovation Ecosystem*

**Source: Candidate**

Kosovo is lacking to have an ICT drive ecosystem with a focus on unsealing value growth for different sectors from medicine, agriculture, tourism, and others. Each sector in the individual plan represents an industry relatively connected to the ICT ecosystem, but those connection are minimalistic and not efficiency purposive connections. Therefore, there is an opportunity to bring these sectors together in an ecosystem that works organically and provides sustainable development of Kosovo with a competitive global aim. Tremendous growth and job creation may result from these sectorial cooperation models but to do so, there needs to bridge gaps among existing ICT ecosystem actors in Kosovo and other sectoral ecosystems.

Collaborative ecosystems foster better align policy with stakeholders' needs, provide stronger channels of funds and afford spaces for collaboration inside the ecosystem. The ecosystem can have a better and wider impact on the public sector to propose effective legislation regarding the specific sector or industry. The ICT innovation ecosystem individually can help other sectors to solve their key problems through ICT products and services (ICT applications). Finally, these cooperation sectors in an ecosystem can be linked and expand to the international sphere by sharing best practices and fostering the economic development of Kosovo.

# CHAPTER 3: METHODOLOGY

## 3.1. Introduction

This study will examine the impact of the Innovation Ecosystem on firm innovation performance and the development of new products in the ICT sector in Kosovo. The focus of this paper will be on finding and analysing the symbiotic and reciprocal relationships among the actors and their impact on innovation. This would be the core finding toward doing further in-depth research about the impact of the Innovation Ecosystem in the ICT sector in Kosovo. The hypothesis will be constructed to determine the effect of certain actors of the Innovation Ecosystem on the firm innovation and new product development indicators. The study will be based on the deductive approach since the deductive approach commonly is associated with quantitative research studies.

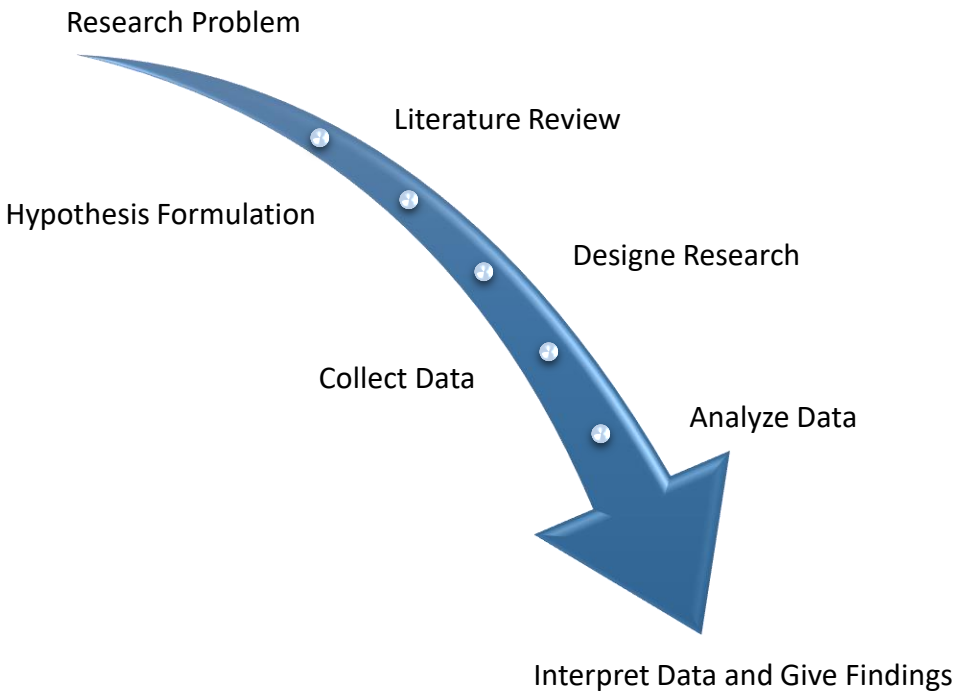
In this chapter, there will be elaborated the research design and the research methodology applied in this study. The focal points of this chapter would also be the research process, research approach, research design, and the methods of data collection, sampling process, sample size, data collection sources, and survey instrument. In the end, the chapter will give an overview of the study variables and the techniques applied to test the hypotheses of the study.

## 3.2. Research Process

This section describes the flow of the research process. As it is shown in the figure below, the research process describes a set of steps and procedures that are fundamental for doing effective research (Fox and Alldred, 2015; Kothari, 2004; Lorz, Mueller, and Volery, 2013). The analytical framework includes seven categories as follow:

- Formulating the Research Problem (objective of study),
- Extensive Literature Review (review of theories, concepts, and previous research findings),
- Formulation of Hypotheses,
- Preparing the Research Design ( including sample design),
- Collecting the Data (execution of the research),
- Analysis of Data (testing hypotheses),
- Interpretation of Data and Findings.

*Figure 16. The Research Process*




**Source: Adopted from Fox & Alldred, 2015; Kothari, 2004; Lorz, Mueller, & Volery, 2013**

### 3.2.1. Research Approach

When conducting scientific research it is very important to decide which research approach you perform. The two main research approaches vastly used among researchers are the inductive approach and the deductive approach. These two approaches perform in opposite directions. The deductive approach can be explained briefly as moving from general to specific (Gill and Johnson, 1997; Gray, 2013), while the inductive approach can be understood as moving from specific to general (Glaser and Strauss, 2017; Miller & Brewer, 2003; Thomas,

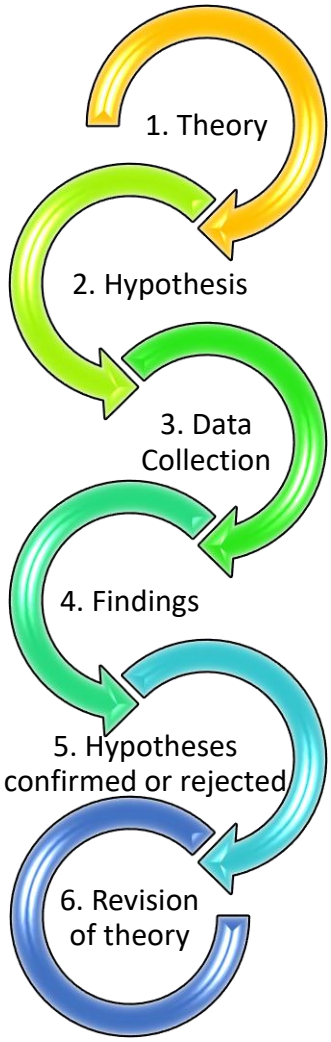
2006). While the deductive approach is used to test a theory, the inductive approach is used to generate a theory.

As Crowther and Lancaster (2008) explain, deductive research develops theories or hypotheses and then tests these theories or hypotheses through empirical observation, and it is considered as the only justifiable method of research to develop knowledge and therefore should also be the only approach that is used in social sciences. Gill and Johnson (1997) also give a more clarifying view of the process of deductive research. As Newman (2000) explains, a summary of this process may be conceptualized as follow:

Theory -> General Hypotheses -> Specific Hypotheses -> Data Collection -> Data Analysis -> Results -> Conclusion -> Theory Confirmation / Revision.

As seen above, these steps are connected through a logical line in a linear process. The deduction process has been illustrated by Bryman et al., (2018), as shown in the figure below. It is worth to mention that there may exist cases when this linear order of steps conducting the deductive approach needs to be changed (Bryman and Bell, 2012).

*Figure 17. The process of deduction*




***Source*: Bryman, Bell, and Harley (2018)**

Furthermore, as Saunders et al. (2009) explain when there is extensive literature on the chosen topic from which the hypothesis can be formulated, the deductive method is more suitable. Additionally, other researchers explained that the deductive method is associated with quantitative research studies (Bryman & Bell, 2015).

Based on the above, the deductive approach is considered the most suitable method to identify, select, and analyse information about this study. By applying this approach, the

study hypotheses will be tested. The findings derived from the study may support, correct, or dispute existing theories.

### 3.2.2. Research Design

The research design is the pathway or a framework through which researchers should conduct their research. As Akhtar (2016) mentions, research design not only anticipates and specifies the professedly limitless decisions associated with carrying out data collection, processing, and analysis but it demonstrates a logical basis for these decisions. Ordinarily, two types of analysis can be used to conduct research, one is deductive research and the other is inductive research, respectively, quantitative research or qualitative research (Soiferman, 2010).

The research design is an important step since it regulates the relevance of information collection for the study. Based on the above mention discussions, this research is based on the quantitative method because this approach is more suitable for hypothesis testing and finding correlation among dependent and independent variables.

## 3.3. Data Collection Methods

Quantitative research will be used in order to test the research hypothesis since the deductive approach is generally associated with quantitative researches. It is considered that the quantitative method is the most appropriate method, which is especially suited for testing hypothesis (Sukamolso, 2007). The quantitative research approach is very helpful in determining the relationship between the dependent and independent variables, which are defined in the study (Hopkins, 2008).

### 3.3.1. Sampling process and technique

Considering that the population for this study is massive, it gives the implication to create a representative sample in distinction to the whole population. The first-rate option for deciding a sample that can represent in higher standards the whole population is by random sampling. Not to mention that the random sampling technique is also suitable for conducting inferential statistics (Marczyk et al., 2005). Opposite to other sampling techniques, random sampling increments the chances of the sample being more representative of the general population.

There are generally two types of sampling procedures (Stephan, 1948; Walliman, 2011) known as probability sampling and non-probability sampling.

Probability sampling is recognized as well as “representative sampling” (Kothari, 2004). In this type of sampling, the chances of being selected are equivalent for each case taken from the population. The probability sampling technique oftentimes is associated with survey research. Besides, we have to mention that there are many approaches to choose representative samples. As explained by Walliman (2011), the techniques for selecting representative samples are stratified sampling, cluster sampling, random sampling, etc.

When conducting research studies, especially those who contain a large population it is hardly possible to incorporate the whole population. This happens because of the various limitations, including time, cost, or access to respondents. Facing these limitations, the best option is to carefully select only a few items from the general population of the current study, which would best represent the whole population. As Kothari (2004) explains, these selected items are known as a sample, on the other hand,

the process of selection is known as the sampling technique. It would be easier to use the convenience sampling also known as Accidental Sampling (Dörnyei & Griffee, 2010), where the population that meets certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate are included in the purpose of the study, but this method of sampling does not represent the whole population, in this way it is considered bias. The convenience sampling includes participants who are available and willing to be a part of the study (Creswell, 2005) and are easily accessible to the researcher (Given, 2008; Suen, Huang, & Lee, 2014), and as Dornyei (2007) states, it should meet the preconditions like easy time availability and geographical proximity.

It would be outstanding to use the whole population, but due to limitations and rationality, the majority of researchers does the random sampling technique. As Creswell (2013) says, a sample is a small set of cases that researchers select from a bigger pool and generalizes to the population. Furthermore, this approach is considered more suitable since the questionnaire is planned to be allocated personally to the selected participants of the survey.

### 3.3.2. Sample Size

There are different opinions among scientists regarding the sample size for conducting research. According to Green (1991), the optimal size should be based on the number of independent variables in the chosen model. Bartlett, Kotrlik, and Higgins (2001) argue and recommend that the sample should be five to ten times more than the number of independent variables for multivariate research. In addition to the purpose of the study and population size, according to Miaoulis and Michener (1976) to determine the appropriate

sample size there should be meet usually three criteria: the level of precision, the level of confidence or risk, and the degree of variability in the attributes being measured. Based on the above-mentioned criteria, it is used the Green's (1991) formula to calculate the optimal sample size of this research as shown below:

$$N > 50 + 8m$$

, where m represents the number of independent variables of the study. As seen the formula above, the sample size of this study should be as follows:

$$N > 50 + 8x7$$

$$N > 50+56$$

$$N>106$$

Based on the calculation conducted above, the sample size requested to do correlation and regression analysis for this study has resulted to be more than 106 participants.

### 3.3.3. Source of Data Collection

The study will use primary quantitative data, which will be collected from primary sources- actors of the innovation ecosystem. The self-administrated questionnaires was planned to be used hand-delivered by the author with the 'drop-off and pick-up' method even though it would be time consumable and more costly compare to mail distribution. This method is explained by Steel et al. (2001), who explains that the ''drop-off and pick-up'' technique is a hand delivery and hand retrieved method of a self-administered questionnaire.

The author of this study believed that this technique would have increased the rate of response and would have enabled faster collection of data. As Allred and Ross-Davis (2011) explain, even in cases when there is no face-to-face contact, the chances of completing the questionnaire are much greater when the survey instrument is left by personal delivery delivered in hand comparing to those delivered by mail or electronic mail. However, considering the period in which the field measurement was performed turned out to be a period in which the world was facing the Covid-19 pandemic, the form of distribution of the questionnaire through the online platform Google Form was chosen.

### 3.3.4. Data Collection Instrument

Since the study is conducted using the deductive approach, the questionnaire is considered to be the most suitable instrument for gathering data. As Saunders et al. (2003) and Sekaran and Bougie (2016) explain, a questionnaire survey is a methodology which is usually associated with deductive research and it is generally used to collect data from a large population in an economical manner, and according to Bryman (2006) it is found to be the most common technique for data collection in quantitative studies. The survey questionnaire for this study will be developed by using measurement scales adopted from prior studies and, from the author. The questionnaire will consist of three parts: the first part will contain general and demographic information about the participants of the survey, the second part will consist of the questions related to the innovation ecosystem actors and the third part will have the questions regarding the firm innovation performance and development of new products. After completing the questionnaire design, it will be conducted an item consistency test, as Sekaran and Bougie (2016) mention, it is a test of the consistency of responses to all the items in a measure to establish that the questions hang together as a set. After that

process, the questionnaire will be tested for internal consistency and reliability. For this reason, a pre-test in a small pilot group will be conducted to be ensured that all respondents will understand all the questions in the survey and there will not be any space for uncertainty in answering these questions. As is suggested by Czaja (1998) the group of respondents will be asked to fill a questionnaire draft after that they will be asked if they understood the questions, and, if they eventually had difficulties in answering them. After that process, the final version of the questionnaire will be designed and will be distributed to the selected respondents, respectively, to the ICT owners or representatives. As mentioned above, the optimal size of this study is 106 respondents. The optimal sample size of this study is determined based on Green's (1991) formula. The data will be analysed using the Statistical Package for Social Science (SPSS). The Cronbach's Alpha reliability test will be executed to check the internal consistency of the questionnaire, then the data will be analysed using both descriptive and inferential statistical techniques such as Correlation and Multiple Regression, etc.

## 3.4. The Study Variables

A good theoretical framework identifies and defines the important variables in the situation that are relevant to the problem and subsequently describes and explains the interconnections among these variables (Sekaran and Bougie, 2016). Accordingly, following this direction, the variables have been carefully determined and grouped into dependent and independent variables. As mentioned above in the paper, the vast majority of the survey questionnaire for this study will be developed by using measurement scales adopted from prior studies. This study will have seven independent variables, as follow:

1. Research institutions and universities
2. Government
3. Financial Institutions
4. Start-ups and enterprises
5. Non-government organizations
6. Incubators and Accelerators
7. Culture and social norms

These independent variables will be measured by adopting the previously used scale by Corrente et al. (2008); Striteska & Prokop (2020), and its researcher variable. On the other hand, the dependent variables have been carefully selected from different authors to give a broader and comprehensive overview of the Firm's Innovative Performance, including new product development, culture to innovate, and firm performance. As Murphy (1996) recommended to use multiple performance dimensions. As a result, following the recommendations from above, the firm's innovative performance in this study is measured through four dimensions, such:

1. Firm's introduction of new or significantly improved product
2. Profitability
3. Growth
4. Efficiency

The items of the questionnaire (questions) have been grouped according to the variables selected to this study. Consequently, the questionnaire will contain three parts:

1. General and/or demograpfic informations of the participants,

2. Innovation ecosystem variables,

3. Performance variables.

The measurement scale used on this study was Likert Scale. The respondents were asked to express their opinions expressing their level of agreement on a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. In the table below there have been summarized the variables, their description and their measurement scale.

*Table 4. The description of study variables*

| | Variable | Description | Type of variable* | No. item | Adapted from | Measurement scale |
|---|---|---|---|---|---|---|
| **Innovation Ecosystem Variables** | RD | R&D that firm has contracted out to other firms (including other firms in their group) or to the public or private research organizations and universities | IV | 2 | Striteska & Prokop (2020) | Likert scale (from strongly disagree to strongly agree). |
| | GOV | "Government Programs" concern the presence and quality of programs directly assisting SMEs at all levels of government (national, regional, municipal). | IV | 2 | Corrente el al. (2008), Albros-Garrigos & Barrera (2011) | Likert scale (from strongly disagree to strongly agree). |
| | FIN | "Entrepreneurial Finance" represents the availability of financial resources for small and medium enterprises (SMEs). | IV | 2 | Corrente el al. (2008) | Likert scale (from strongly disagree to strongly agree). |

| | | | | | | |
|---|---|---|---|---|---|---|
| | CO | Cooperation on any innovation activities with other firms or institutions. | IV | 2 | Striteska & Prokop (2020) | Likert scale (from strongly disagree to strongly agree). |
| | NGO | Non-government organization projects to help start-ups and other enterprises of the innovation ecosystem | IV | 2 | Researcher | Likert scale (from strongly disagree to strongly agree). |
| | INC&AC | The cooperation with Incubators and Accelerators | IV | 2 | Researcher | Likert scale (from strongly disagree to strongly agree). |
| | CULT | "Cultural and Social Norms" represents the extent to which social and cultural norms encourage or allow actions leading to new business methods or activities that can potentially increase personal wealth and income. | IV | 2 | Corrente el al. (2008) | Likert scale (from strongly disagree to strongly agree). |
| **Performance Variables** | INIP | Introduction of a new or significantly improved product. | DV | 1 | Rogers (1998); Striteska & Prokop (2020) | Likert scale (from strongly disagree to strongly agree). |
| | PRF | Profitability: The account-based measurement: ROA (Return on Assets), ROE | DV | 3 | Gow et al. (1998); Santos & Brito (2012) | Likert scale (from strongly disagree to |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | (Return on Equity), and PM (Profit Margin). | | | | strongly agree). |
| | GRTH | Growth: Market-share growth, Asset growth, Net revenue growth, Net income growth, Number of employees growth | DV | 3 | Santos & Brito (2012) | Likert scale (from strongly disagree to strongly agree). |
| | EFF | Efficiency: Maximising outputs from given inputs, and so minimizing the costs | DV | 3 | Murphy et al. (1996) | Likert scale (from strongly disagree to strongly agree). |

**IV-Independent Variable DV- Dependent Variable*

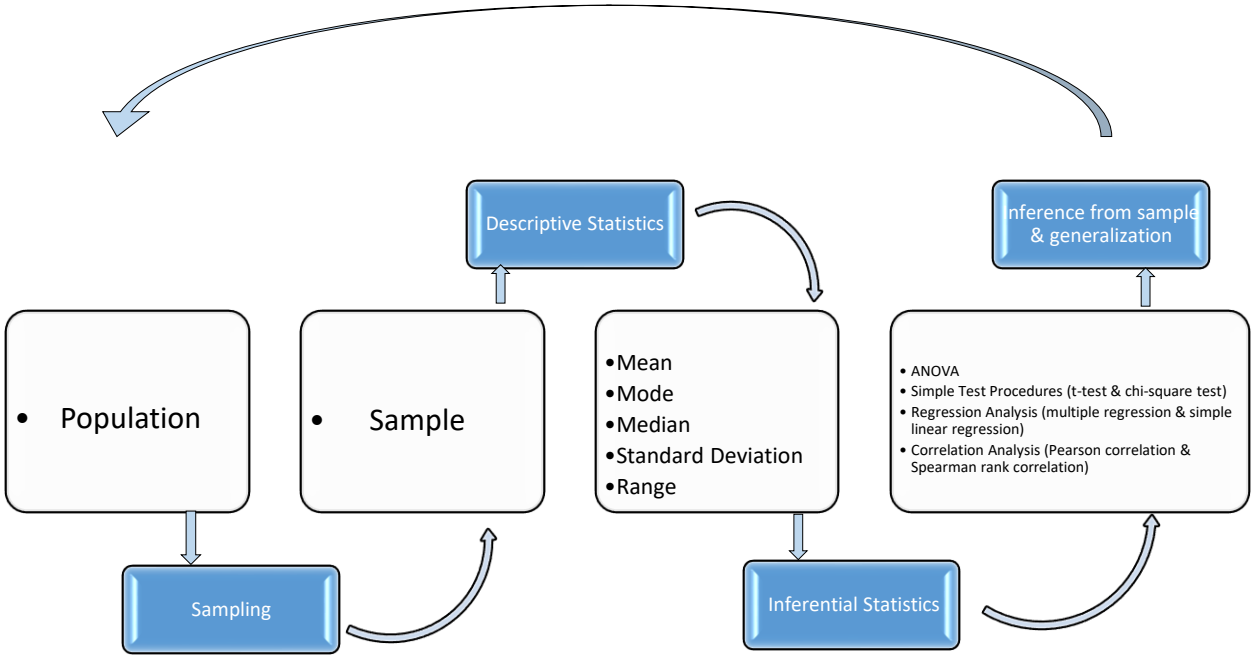
**Source: Candidate**

## 3.5. Data analysis

The data of the research will be analysed using the Statistical Package for the Social Sciences (SPSS). First, the reliability test will be executed to check the consistency of the data then the validity test is done to check the accuracy of the data. The two tests mentioned above are conducted because they are very important tools, especially in quantitative researches. Afterward, the data will be analysed using descriptive and inferential statistical techniques (see Figure 17). As Sekaran (2003) explained, the descriptive I a very helpful technique to have a better understanding of data, but it is not appropriate to provide useful information on research situation and multiple relationships between many latent variables. Consequently, the application of the inferential statistics techniques such as correlation and multiple regression is necessary to complement the descriptive technique. Inferential statistics helps

to establish relationships among variables and draw conclusions therefrom (Sekaran and Bougie 2016). It will be a very helpful tool to test the hypotheses raised in this research.

*Figure 18. Data Analysis*




**Source: Author elaboration**

### 3.5.1. Reliability test

The survey questionnaire used for this research will be developed by adopting measurement scales from previous studies. This can make it difficult to come up with a measurement procedure if we are not sure if the construct is stable or constant (Isaac & Michael, 1970). Since the target respondents of this research were from the field of ICT, and assessing that performance in this field requires knowledge of English language, then it was concluded by

the author of the study that the questionnaire be distributed in English language. The reliability check of the questionnaire will be performed to assess the quality of the measurement procedure. Also, this brings the need to verify the internal consistency and reliability of the used scale. Furthermore, as Cronbach (1951) mentioned, one of the most popular reliability statistics in use today is Cronbach's alpha. Even today this continues to remain the most usable and popular reliability test. Consequently, the Cronbach's Alpha will be performed. This method is a very important tool to evaluate a questionnaire. In order to determine the internal consistency of the variables, especially those using Likert scale items it is recommended to test the reliability of scales using Cronbach's alpha (Gliem and Gliem, 2003). Cronbach's alpha is an index of reliability associated with the variation accounted for by the true score of the 'underlying construct' (Santos, 1999). Alpha coefficient ranges in value from 0 to 1, the higher the score, the more reliable the generated scale is (Tavakol & Dennick, 2011). By using these proven scientific methods, it is believed that the questionnaire design will meet all the scientific standards to be a reliable method of data collection.

### 3.5.2. Correlation

Correlation is a technique of measurement of the relationship between the variables used in the study. As Ratner (2009) describes the correlation analysis through the Pearson's correlation coefficient (r) measures the strength of the association between variables, ranging from -1 (indicating perfect negative association) to 0 (no association) and +1 (indicating perfect positive association). As Crawford (2006) implies, both variables should be treated equally in that neither is considered to be a predictor or an outcome.

### 3.5.3. Multiple Regression

Since the correlation is used to measure the mutual relationship between two variables, and itself it cannot estimates the value of a dependent variable based on a given value of the independent variable it is necessary to use multiple regression. As Jackson (2015) and Myers (1990) emphasize, multiple regression analysis is concerned with the statistical relationship between two or more independent variables and dependent variables. As a consequence, the multiple regression analysis is considered to be an appropriate model to gain a better understanding of the impact of the selected actors of the innovation ecosystem on the new product development and firm innovation performance. It is worth emphasizing that when multiple regression is achieved using the SPSS, so it gives very important outputs such as the Regression table, Model Summary, and ANOVA table.

## 3.6. Pilot Testing

The pilot testing of the questionnaire of this study was done as a prerequisite to assess the validity of the questionnaire as the main tool of data collection of this study. This pre-testing of the questionnaire was undertaken as a pre-step towards its final distribution to the respondents.

As elaborated earlier in the methodology section, the questionnaire itself contains measurement scales from previous studies undertaken by Striteska & Prokop (2020); Corrente el al. (2008); Rogers (1998); Gow et al. (1998); Santos & Brito (2012); Murphy et al. (1996).

Since the target respondents of this research were from the field of ICT, and assessing that performance in this field requires knowledge of English language, then it was concluded by the author of the study that the questionnaire be distributed in English language. The results

obtained from the Pre-test with a small group of respondents showed that the language used in the questionnaire was not at all a problem in the understanding of the questions by them.

It should be noted that this pilot pre-test group was composed of 15 respondents, a number which is scientifically supported by authors such as Hill (1998) and Hertzog (2008) who in their studies emphasize that the adequate number of participants in a pilot study should be between 10 to 30, specifically 10 to 40.

As elaborated earlier, the next step taken towards completing and validating the questionnaire, as the main data collection tool of this paper, was measuring the internal consistency of variables. Since the variables of this questionnaire used Likert units of measurement then the use of the Cronbach's Alpha Test has been concluded as the right test to measure the consistency of variables. As Santos (1999) explains in his work, the value obtained after testing the Internal Consistency of variables should vary from 0 to 1, and the higher the value of the alpha score (the closer to the value 1) the the most reliable will be scale. As explained by DeVellis (2016); Bland and Altman (1997); Tavakol and Dennick (2011); Nunnally and Bernstein (1994) the suggested values of Cronbach'a Alpha Test should be in the range between 0.70 to 0.95. As seen in the table below, there have been shown the results of the reliability test for each individual variable taken in the pilot test.

*Table 5. Pilot Test Questionnaire Cronbach's Alpha Calculation*

| Variables | Number of Items* | Cronbach's Alpha results |
|---|---|---|
| **Research Institutions and Universities** | 2 | 0.764 |
| **Government** | 2 | 0.894 |
| **Financial Institutions** | 2 | 0.904 |
| **Start-ups and Enterprises** | 2 | 0.949 |
| **Non-government Organizations** | 2 | 0.940 |

| | | |
|---|---|---|
| **Incubators and Accelerators** | 2 | 0.851 |
| **Culture and Social Norms** | 2 | 0.879 |
| **Overall Firm Innovation Performance** | 10 | 0.947 |
| ***Overall Independent and Dependent Variables of the Questionnaire*** | 24 | 0.948 |

***The number of the items refers to the number of questions that were grouped to form the variables***

**Source: SPSS Output. v. 22, 2021**

As seen in the table 5, the overall questionnaire has a Cronbach's Alpha of 0.948. The independent variables of research institutions and universities, government, financial institutions, start-ups and enterprises, non-government organizations, incubators and accelerators, and cultural and social norms had Cronbach's Alpha values of 0.764, 0.894, 0.904, 0.949, 0.940, 0.851, 0.879 respectively; while the dependent variables – the overall firm performance had a Cronbach's Alpha of 0.947.

# CHAPTER 4: FINDINGS AND ANALYSIS OF DATA

## 4.1. Introduction

In this chapter there will be elaborated the results obtained from field measurements. First, a presentation of the results will be made, then it will be conducted an analysis of the findings. Finally, it will be made the interpretation of these findings. Furthermore, the focus of this chapter will also be on reviewing the characteristics of the sample, the development of the

measurement of this study, and the interpretation of the findings. In addition, the hypothesis testing will be analysed on this chapter.

## 4.2. Data collection process

After testing the validity and reliability of the questionnaire, a pilot test was performed. Since these steps taken have resulted within the required scientific frameworks, then the next step taken was the distribution of the questionnaire. Considering the period in which the field measurement was performed turned out to be a period in which the world was facing the Covid-19 pandemic, the form of distribution of the questionnaire through the online platform Google Form was chosen. The period of distribution and data collection was June-August 2021.

The companies sampled for this study as explained above, were ICT companies, which their locations were from different parts of the country of Kosovo. For the purpose of the study, this geographic dispersion of ICT companies among different cities of Kosovo was very helpful toward researching the impact of geographic proximity of ecosystem to the success of a company.

### 4.2.1. Reliability test of questionnaire

As specified above, in order to measure the internal consistency of the variables and their reliability of scales, it is performed the Cronbach's Alpha analysis. As mentioned by Gliem and Gliem (2003) to measure the internal consistency of the variables, specifically those using Likert-scale items it is suggested to test the reliability of scales by using the Cronbach's Alpha.

As explained earlier in the previous chapters, the questionnaire used in this study has measurement scales adapted from previous measurements in combination with measurements of the author of the paper. Items or questionnaire questions, which measured the same construct, were grouped into the respected variables. This is done in order to give a better understanding of the data collected. From the collection of these questions of the survey, there have been derived seven independent variables, such as research institutions and universities, government, financial institutions, start-ups and enterprises, non-government organizations, incubators and accelerators, cultural and social norms, and one dependent variable named overall firm innovation performance. Since the Cronbach's Alpha has been used to measure the internal consistency, as explained by Tavakol and Dennick (2011) the Cronbach's Alpha is expressed in numbers ranging from 0 to 1. The closer to the value 1 the more reliable the measurement is. In this study, Cronbach's Alpha was used to test the reliability of the measurement instrument. Therefore, the findings are as indicated in Table 6.

The overall model of this study had a Cronbach's Alpha of 0.938. The independent variables research institutions and universities, government, financial institutions, start-ups and enterprises, non-government organizations, incubators and accelerators, cultural and social norms had a Cronbach's Alpha of 0.941, 0.945, 0.946, 0.942, 0.947, 0.931, and 0.945 respectively; while the dependent variable, the overall firm innovation performance had a Cronbach's Alpha of 0.944.

*Table 6. Survey Questionnaire Cronbach's Alpha Calculation*

| Variables | Number of Items* | Cronbach's Alpha |
|---|---|---|

| | | |
|---|---|---|
| **Research Institutions and Universities** | 2 | 0.941 |
| **Government** | 2 | 0.945 |
| **Financial Institutions** | 2 | 0.946 |
| **Start-ups and Enterprises** | 2 | 0.942 |
| **Non-government Organizations** | 2 | 0.947 |
| **Incubators and Accelerators** | 2 | 0.931 |
| **Culture and Social Norms** | 2 | 0.945 |
| **Overall Firm Innovation Performance** | 10 | 0.944 |
| ***Overall Independent and Dependent Variables of the Questionnaire*** | *24* | *0.938* |

***The number of the items refers to the number of questions that were grouped to form the variables***

**Source: SPSS Output. v. 22, 2021**

As suggested by Tavakol and Dennick (2011), the acceptable values of alpha should be in range from 0.70 to 0.95, it is come to conclusion that all the items of this study are reliable and have relatively high internal consistency, which led to the next step of this study – the distribution of the questionnaire.

#### 4.2.2. Questionnaire distribution and collection

In this research study, a total of 119 questionnaires were taken as the final sample of this study. A total of 130 questionnaire were collected. From the total number of collected

questionnaire, 11 resulted not valid because of duplicity or a missing data at the geographic data because the other questions of the survey were designed to have mandatory answers.

Given the scientific suggestion of the authors VanVoorhi and Morgan (2007) that in their work suggest that for one predictor at least 10 participants are needed, then the necessary number of questionnaires in this framework is calculated. Since this scientific research has seven independent variables (or predictors as mentioned above) then it is concluded that the number of 119 completed questionnaires is considered sufficient. In the following table, we can see in tabular form the information about the distribution and collection of the questionnaires.

*Table 7. Questionnaire distribution and collection*

| Questionnaires | Number | Percentage (%) |
|---|---|---|
| **Questionnaires collected** | 130 | 100% |
| **Questionnaires rejected** | 11 | 8% |
| **Questionnaires analysed** | 119 | 92% |

**Source: Field Survey (2021)**

## 4.3. Data analysis

As defined in the sections above, to collect the opinions of the respondents according to the variables of the study, the answers have been codified using Likert-scale data. Likert-scale in contrast to Likert-type items are a combination of Likert-type items collected into a single

variable during the process of data analysis. When the researcher use Liker-scale items, he/she is more interested in the combined score derived from the calculation (sum/mean) from Liker-type items. As seen in the sections above, the researcher of this study has computed variables to get a better understanding of the subject of the study applying the recommended statistical procedures. As suggested by Batterton and Hale (2017); Boone and Boone (2012), the suggested data analysis procedures for Likert scale data must include mean form central tendency, standard deviation in the descriptive statistics, Pearson's r in correlation analysis and also ANOVA, t-test and regression in inferential statistics. These suggested analysis procedures have been used in the next sections of this study to analyse the Likert scale data.

## 4.4. Descriptive statistical data interpretation

In this section, it is presented the analysis of descriptive statistics. The raw data have been summarized and with the help of descriptive statistical tools those data have been interpreted in the form that are easy understandable. The demographic information represented in the sections below is a true representation of ICT companies in Kosovo.

### 4.4.1. Demographic variables on the scope of descriptive statistics

The chapters below represent in the tabular and graphical form the general findings and demographic information of ICT companies – as respondents of this research. The results have been extracted from the questionnaire conducted with the respondents of this study.

#### 4.4.1.1. Demographic characteristics of company's headquarter location

The first question of the survey, respectively, in the demographic part was related to the municipality location of the ICT companies' headquarters.

*Table 8. Characteristics of respondents by companies' headquarter location*

| Respondent's Headquarter Location | Frequency | Percentage (%) |
|---|---|---|
| Prishtinë | 58 | 48.7% |
| Ferizaj | 8 | 6.7% |
| Pejë | 7 | 5.9% |
| Gjilan | 7 | 5.9% |
| Gjakovë | 6 | 5% |
| Mitrovicë e Jugut | 5 | 4.2% |
| Other* | 28 | 23.5% |
| Total | 119 | ≈100% |

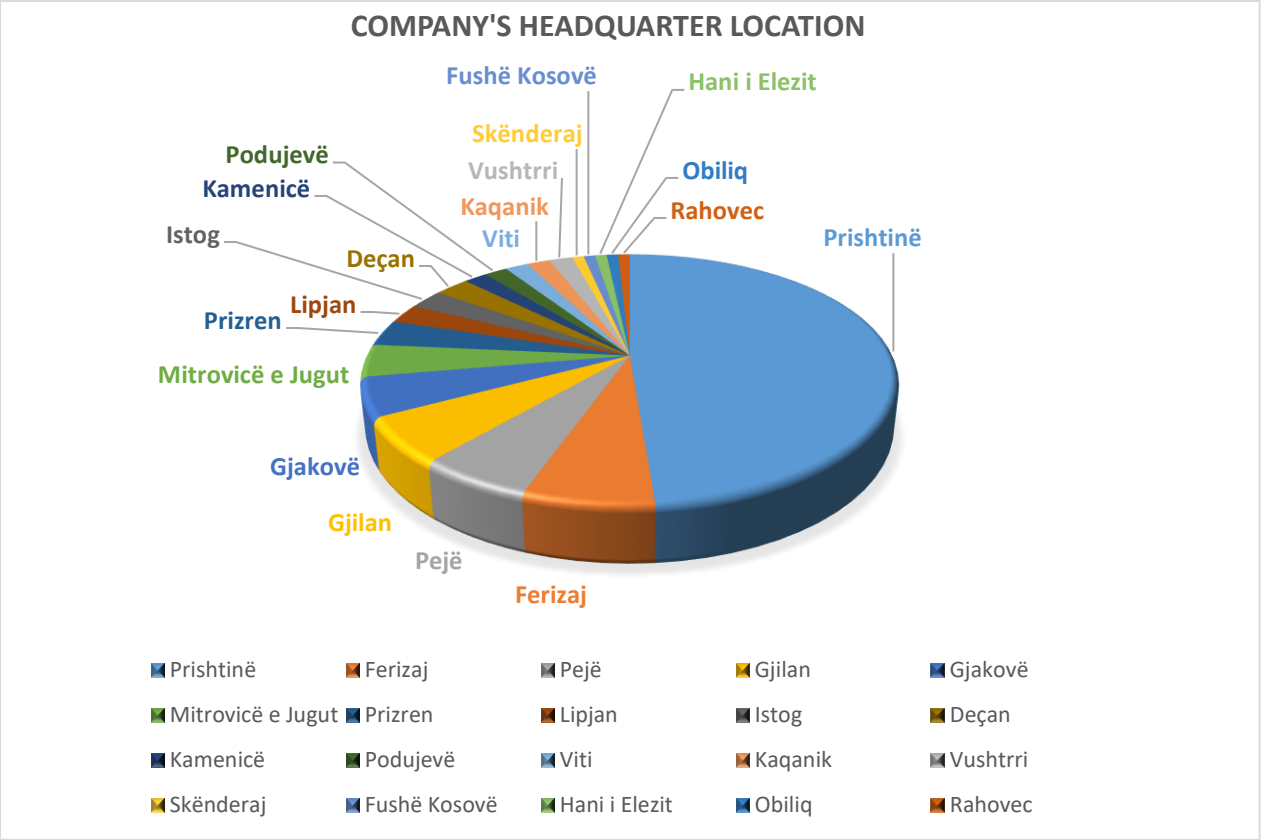
**Due to low representation, the other cities have been collected in one category.*

**Source: Field Survey, 2021**

As represented in the Table 8, the city of Prishtina dominates as a headquarter location of ICT companies that operate in Kosovo. It constitutes 48.7% of the ICT businesses or expressed in numbers, it represent 58 ICT businesses. On the other hand, the three other top cities of Ferizaj, Pejë and Gjilan represent 6.7%, 5.9% and 5.9% respectively. Comparing the first top ranked city – the city of Prishtina to other cities remained; we can come to conclusion that there is a very distinctive distribution between cities. This led us to a question discussed earlier in the study about the geographic proximity of innovation actors. Based on this distribution of ICT businesses in Kosovo with a focus point in the city of Prishtina, we can come to conclusion that the geographic proximity if innovation ecosystem actors plays a very

important role. In the Figure 18, it is represented visually the dispersion of ICT companies' headquarters among the cities of Kosovo.

*Figure 19. Company's Headquarter Location*




**Source: Author Field Survey, 2021**

#### 4.4.1.2. Demographic characteristics of company's size

One of the demographic questions that were in the interest of the research was about the company's size. In the table 9, it is shown the distribution of the ICT companies in Kosovo among the classification of companies based on the number of employees.

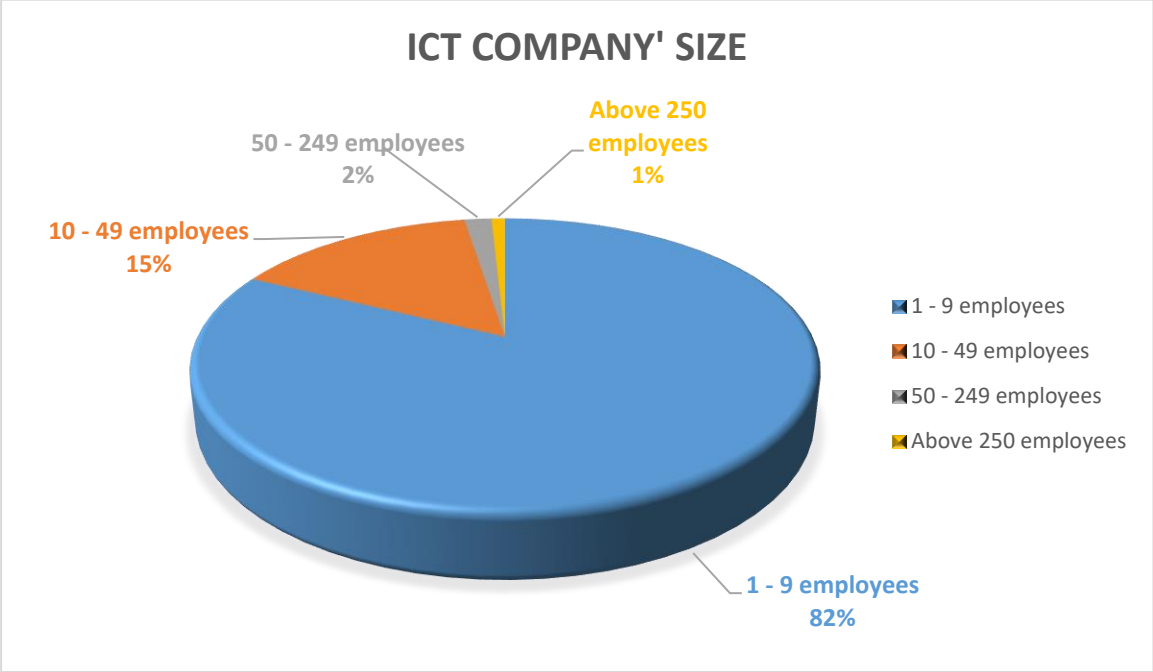
*Table 9. Company's size*

| Company Size | Frequency | Percentage (%) |
|---|---|---|
| 1 - 9 employees | 98 | 82.4% |
| 10 - 49 employees | 18 | 15.1% |
| 50 - 249 employees | 2 | 1.7% |
| Above 250 employees | 1 | 0.8% |
| Total | 119 | 100% |

**Source: Field Survey, 2021**

Based on the results of the survey presented in the table above, the vast majority of the surveyed ICT companies, respectively 98 of them or 82.4% are classified as micro companies, since they declared less than nine employees. 15.1% or 18 surveyed ICT companies fall under 10-49 employees category which based on the employment criteria are classified as small businesses. 1.7% of ICT companies has declared that employee 50-249 employees, which that number may classify them as medium-sized companies. Whereas, only 0.8% or 1 surveyed ICT company has declared to employ more than 250 employees, that classified that company as a large enterprise. Summing the results in the cumulative method, we can come to conclusion that more than 99% of the surveyed ICT companies in this study are SME or small and medium-sized enterprises. Below, we can see the results, represented visually in the Figure 19.

*Figure 20. ICT Company's Size*




**Source: Field Survey, 2021**

#### 4.4.1.3. Demographic characteristics of company's geographic market

The researcher wanted to know about the market of the ICT companies that were part of the survey. They could select one or more of the listed market as their place of selling goods and services. As seen in the table 10, 93.3% of surveyed ICT companies sell their products and services in the local market, 66.4% in the regional market or classified as Balkan countries. On the other hand, 42.9% of them sell their products and services in the European Union market, and 19.3% of ICT surveyed companies sell their products and services in other countries that were not mentioned in the markets above.

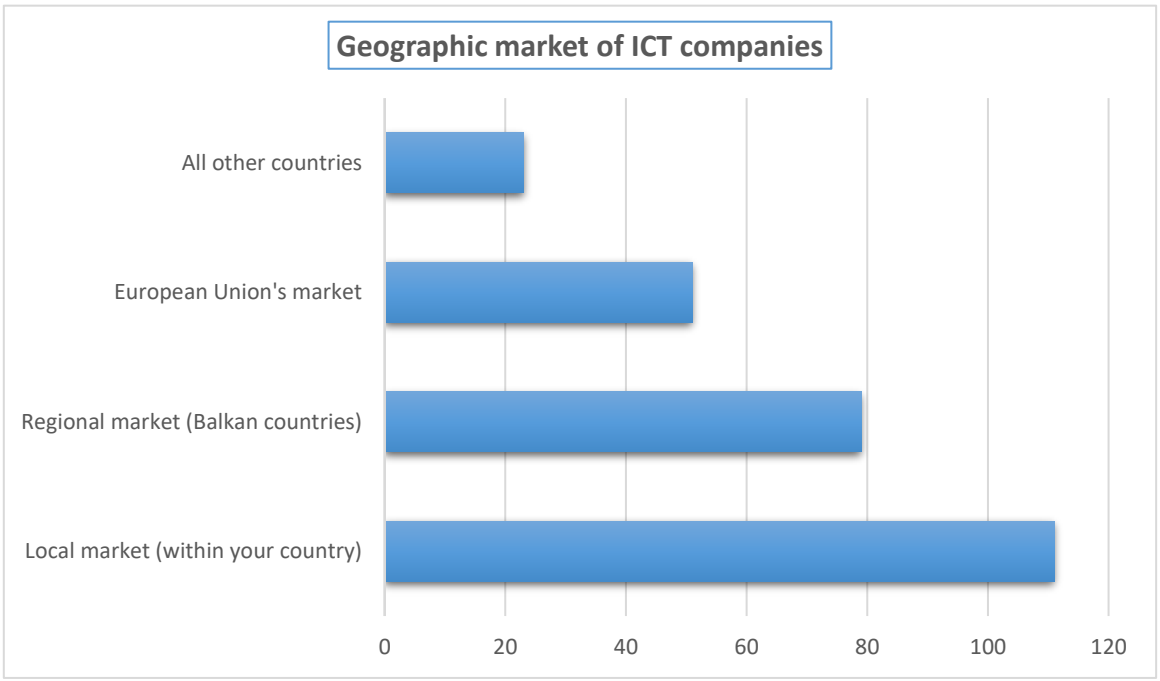
*Table 10. Geographic market of ICT companies*

| Geographic market of ICT companies | Frequency | Percentage (%) |
|---|---|---|
| Local market (within your country) | 111 | 93.3% |
| Regional market (Balkan countries) | 79 | 66.4% |
| European Union's market | 51 | 42.9% |
| All other countries | 23 | 19.3% |

**Source: Field Survey, 2021**

As seen above, the ICT industry in Kosovo has a great potential of becoming an export-oriented industry. In the figure below, the tabular results presented above, have been replicated in the visual form.

*Figure 21. Geographic market of ICT companies*




**Source: Field Survey, 2021**

#### 4.4.1.4. Demographic characteristics of company's involvement in the ICT ecosystem in Kosovo

The self-identification of relevant actors as part of an innovation ecosystem should be the essential step of the leaders of an ecosystem. As researched and elaborated in more detail in the above sections of this paper, an innovation ecosystem is an organic formation. Analysing in more detail the results of field research, it is noted that geographical proximity plays a huge role in being part of an ecosystem but is not always a decisive factor. Illustratively explained the results of the survey of this paper, there have been cases when the business has been very close to the innovation ecosystem but has identified itself as not a member of the ecosystem. Alternatively, there have been businesses that have been geographically further away from the innovation ecosystem, but that have identified themselves as members of the innovative ecosystem. This suggests that the development of technology has diminished the essential impact that the geographical factor has had before. Now, businesses are technology-related, and can be part of any kind of business formation, but always remembering that no matter how technology evolves, the physical factor still remains primary.

*Table 11. ICT Company's Involvement in the ICT Ecosystem in Kosovo*

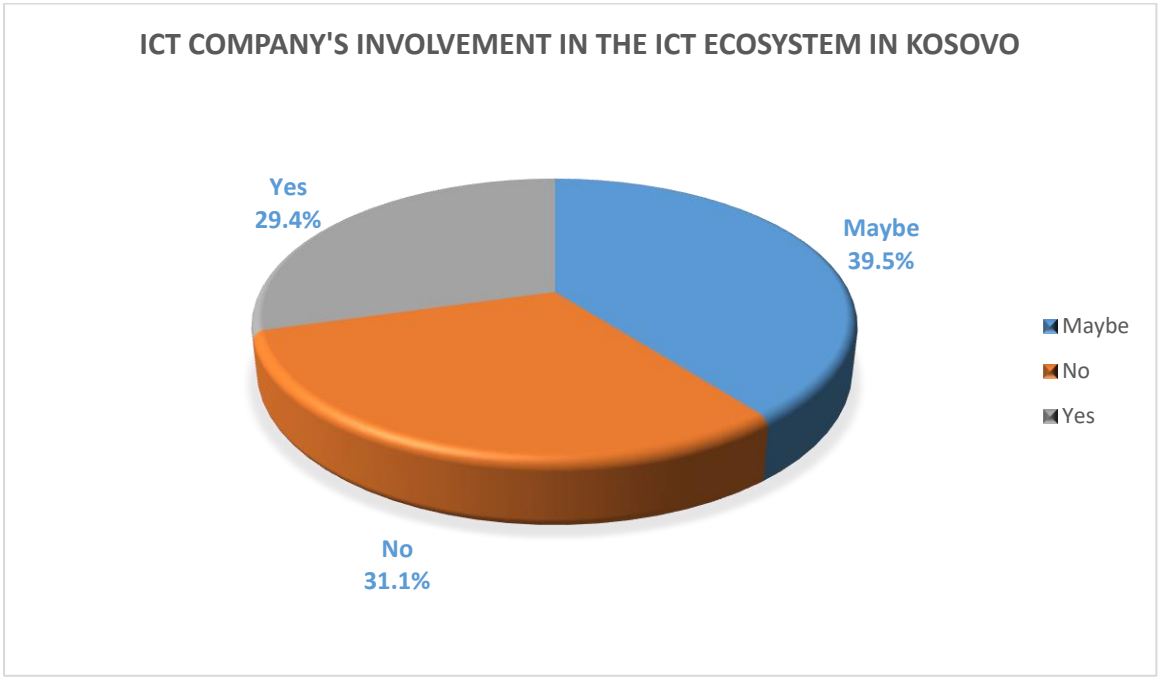
| ICT Company's Involvement in the ICT Ecosystem in Kosovo | Frequency | Percentage (%) |
|---|---|---|
| Yes | 35 | 29.4% |
| No | 37 | 31.1% |

| | | |
|---|---|---|
| Maybe | 47 | 39.5% |

**Source: Author Field Survey, 2021**

Based on the results presented on the table 11, we can understand that the ICT Innovation Ecosystem in Kosovo has a long runway to embrace the all stakeholders or innovation ecosystem actors, to make them active part of it. As seen in the table above 31.1% of surveyed ICT businesses have identified themselves as a non-part of the ecosystem, 29.4% of them have identified themselves as part of the ecosystem. On the other hand, 29.4% of surveyed ICT businesses do not have clarity about their participation in the ecosystem. In the figure below it is shown visually the perception of the surveyed ICT businesses about their involvement in the ICT ecosystem in Kosovo.

*Figure 22. ICT Company's Involvement in the ICT Ecosystem in Kosovo*




**Source: Author Field Survey, 2021**

### 4.4.2. Descriptive statistical interpretation of innovation ecosystem variables

Innovation ecosystem impact on new product development and firm innovative performance is a phenomenon that is impossible to be measured directly. Therefore, as discussed in sections above of Chapter 3, there are 14 Likert items found from literature that are considered to measure the impact of innovation ecosystem on new product development and firm performance. These items were combined based on the indicators that measure in order to form the seven innovation ecosystem actors that will be acting as independent variables in this study.

Following sections report the descriptive statistics in tabular form for each of the seven IE variables; Research Institutions and Universities, Government, Financial Institutions, Start-ups and Enterprises, Non-government Organizations, Incubators and Accelerators, Culture and Social Norms.

#### 4.4.2.1. Descriptive statistics of the IE variable – Research institutions and universities

In this study the impact of Research institutions and universities on new product development and firm performance was measured by two Likert type items with responses codified from 1 – Strongly Disagree to 5 Strongly Agree. Those two questions aimed to find respondents opinion about how strong is the impact of universities and research institutions on their business innovative performance? Table 12 shows the frequency and percentage respondent results for each question.

*Table 12. Descriptive Statistics for Research Institutions and Universities*

| Nr of items | Research Institutions and Universities | Strongly Disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | The collaboration with private and public research organizations and universities has helped our company to develop new products and services | 2 | 1.7% | 5 | 4.2% | 33 | 27.7% | 54 | 45.4% | 25 | 21% |
| **2** | The collaboration with private and public research organizations and universities has improved the financial status of our company | 3 | 2.5% | 6 | 5.0% | 43 | 36.1% | 43 | 36.1% | 24 | 20.2% |

**Source: Field Survey, 2021**

Results indicate that 25 respondents representing 21% strongly agree that the collaboration with private and public research organizations and universities has helped their company to develop new products and services. 54 respondents or 45.4% agreed with the same statement while 33 respondents or 27.7% had neutral opinion. As a result, we can see that the dispersion of the respondents in this statement is mostly the same among negative and positive answers. In the next question, respondents were asked to show their opinion whether the collaboration with private and public research organizations and universities has improved the financial status of their company. 24 respondents or 20.2%

strongly agree to this statement, 43 or 36.1% of respondents agreed and 43 or 36.1% of respondents had neutral opinion to this statement.

The results derived from the two questions regarding the collaboration of ICT businesses with private and public research organizations and universities show a wide dispersion of respondents among negative and positive statements with a high frequency on positive statements. This indicates that there exists collaboration between ICT businesses on one hand and private and public organizations and universities on the other hand.

#### 4.4.2.2. Descriptive statistics of IE variable – Government

The question of the government programs available in their country has helped their company to develop new products and services was measured by 5 Likert type items with responses ranging from 1 – Strongly Disagree to 5 – Strongly Agree. The items with their corresponding statistical values are presented in Table 13. To measure if the government programs have helped the ICT companies to develop new products and services and to improve their financial status the respondents had to answer two Likert-type items.

*Table 13. Descriptive Statistics for Government*

| Nr of items | Government | Strongly Disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % |
| 1 | The government programs available in our country has helped our company to develop | 20 | 16.8 % | 19 | 16.0 % | 13 | 10.9 % | 49 | 41.2 % | 18 | 15.1 % |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | new products and services | | | | | | | | | | |
| **2** | The government programs available in our country has improved the financial status of our company | 20 | 16.8 % | 22 | 18.5 % | 27 | 22.7 % | 35 | 29.4 % | 15 | 12.6 % |

**Source: Field Survey, 2021**

In the question if the government programs have helped their company to develop new products and services, 18 or 15.1% of respondents strongly agreed, 49 respondents or 41.2% agreed, and 13 respondents or 10.9% had neutral opinion. The second question aimed to understand whereas the government programs have helped their company to improve their financial status. 15 respondents or 12.6% strongly agreed that the government programs have helped their company to improve their financial status. 35 respondents or 29.4% agreed to this statement and 27 respondents or 22.7% had neutral opinion.

The finding proved that most of the respondents' answers were positive indicating that most of the respondents consider that the government programs have helped ICT companies to develop new products and services and to improve their financial status.

#### 4.4.2.3. Descriptive statistics of IE variable – Financial Institutions

The impact of banking system and other financial sources toward developing new products and services and improving the ICT company's financial performance was measured by two Likert type items, with responses ranging from 1 – Strongly Disagree to 5 – Strongly Agree.

*Table 14. Descriptive Statistics for Financial Institutions*

| Nr of items | Financial Institutions | Strongly Disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % |
| **1** | The banking system and other financial sources has been very helpful toward our company to develop new products and services | 5 | 4.2% | 26 | 21.8% | 18 | 15.1% | 47 | 39.5% | 23 | 19.3% |
| **2** | The banking system and other financial sources have been very helpful to improve the financial status of our company | 12 | 10.1% | 22 | 18.5% | 25 | 21% | 40 | 33.6% | 20 | 16.8% |

**Source: Field Survey, 2021**

The results from the Table 14 show that 23 respondents or 19.3% strongly agreed that the banking system and other financial sources have been helpful toward their company to develop new products and services. Moreover, 47 respondents or 39.5% agreed to that statement and 18 respondents or 15.1% had neutral opinion. In the second question, the respondents were asked if the banking system and other financial sources have helped their

company to improve their financial status. 20 respondents or 16.8% strongly agreed, 40 respondents or 33.6% agreed and 25 respondents or 21% had neutral opinion.

The results from the table above show that majority of responses are concentrated on the positive answers indicating that the banking system and other financial sources have helped the ICT companies to develop new products and services and to improve their financial status.

#### 4.4.2.4. Descriptive statistics of IE variable – Start-ups and enterprises

The cooperation of ICT companies with other companies to develop new products and services and to improve the ICT companies' financial status have been measured by 2 Likert type items with responses ranging from 1 – Strongly Disagree to 5 – Strongly Agree. The results are presented in the Table 15.

*Table 15. Descriptive Statistics for Start-ups and Enterprises*

| Nr of items | Start-ups and Enterprises | Strongly Disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % |
| 1 | The cooperation on innovation activities with other companies has helped our company to develop | 1 | 0.8% | 13 | 10.9% | 30 | 25.2% | 37 | 31.1% | 38 | 31.9% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | new products and services | | | | | | | | | | |
| **2** | The cooperation on innovation activities with other companies has improved the financial status of our company | 2 | 1.7% | 10 | 8.4% | 37 | 31.1% | 32 | 26.9% | 38 | 31.9% |

**Source: Field Survey, 2021**

The results from the table above show that 31.9% (38 respondents) strongly agreed that the cooperation with other companies has helped them to introduce new product and services. Moreover, 31.1% or 37 respondent agreed to that statement, and 25.2% or 30 respondents of respondents had neutral opinion.

In the question whether the cooperation with other companies has improved their financial status, 38 respondent or 31.9% strongly agreed, 32 respondents or 26.9% agreed and 37 respondent or 31.1% had neutral opinion.

From the results presented in tabular form, we can see that most of the answers are strongly agree and agree category indicating that most of respondents consider that the cooperation with other companies has helped the ICT companies to introduce new product and services and to improve their financial status.

#### 4.4.2.5. Descriptive statistics of IE variable – Non-government organizations

The variable of NGOs projects was measured by 2 items scale with responses ranging from 1 – Strongly Disagree to 5 – Strongly Agree. The respondents were asked to give their opinions regarding their participation on NGOs projects that have had helped their company to develop new products and services and to improve their financial status. The results are presented in the table below.

*Table 16. Descriptive Statistics for Non-government organizations*

| Number of items | NGOs | Strongly Disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % |
| **1** | Participation on NGOs projects has helped our company to develop new products and services | 6 | 5.0% | 18 | 15.1% | 33 | 27.7% | 34 | 28.6% | 28 | 23.5% |
| **2** | Participation on NGOs projects | 9 | 7.6% | 13 | 10.9% | 37 | 31.1% | 30 | 25.2% | 30 | 25.2% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | has improved the financial status of our company | | | | | | | | | | |

**Source: Field Survey, 2021**

The results present above show that 28 participants or 23.5% strongly agreed that their participation on NGOs projects have helped their company to develop new products and services. 34 participants or 28.6% agreed and 33 participants or 27.7% had neutral opinion. In the statement whereas their participation on NGOs projects have helped their company to improve their financial status, 30 participants or 25.2% strongly agreed, 30 participants or 25.2% agreed and 37 or 31.1% had neutral opinion.

Findings show that the impact of NGOs projects on ICT companies is neutrally and positively stated meaning that the dispersion of the respondents among pre-codified answers was mostly even between neutral and positive answers.

#### 4.4.2.6. Descriptive statistics of IE variable – Incubators and Accelerators

Incubators and accelerators variable in this study is measured by 2 Likert type items with responses ranging from 1 – Strongly Disagree to 5 – Strongly Agree. The results are presented in the table below.

*Table 17. Descriptive Statistics for Incubators and Accelerators*

| Nr of items | Incubators and Accelerators | Strongly Disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % |
| 1 | The cooperation | 10 | 8.4% | 30 | 25.2% | 29 | 24.4% | 40 | 33.6% | 10 | 8.4% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | with Incubators and Accelerators has helped our company to develop new products and services | | | | | | | | | | |
| **2** | The cooperation with Incubators and Accelerators has improved the financial status of our company | 12 | 10.1% | 28 | 23.5% | 38 | 31.9% | 31 | 26.1% | 10 | 8.4% |

**Source: Field Survey, 2021**

In the first statement, the respondents were asked to express their opinion whether the cooperation with incubators and accelerators has helped their companies to develop new products and services. 10 respondents or 8.4% strongly agreed, 40 respondents or 33.6% agreed and 29 respondents or 24.4% had neutral opinion.

In the second statement, the respondents were asked whether the cooperation with incubators and accelerators has helped their company to improve their financial status. 12 respondents or 10.1% strongly agreed, 31 respondents or 26.1% agreed and 38 or 31.9% had neutral opinion.

Based on the results it is clear that more than half of the respondents believe that their cooperation with incubators and accelerators has helped their companies to introduce new product and services and to improve their financial status.

#### 4.4.2.7. Descriptive statistics of IE variable – Culture and social norms

Culture and social norms variable of this study was measured by 2 Likert type items with responses ranging from 1 – Strongly Disagree to 5 – Strongly Agree. The results are presented in the Table 18.

*Table 18. Descriptive Statistics for Culture and Social Norms*

| Nr of items | Culture and social norms | Strongly Disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % |
| 1 | Culture and Social Norms has encouraged our company to develop new products and services | 12 | 10.1% | 31 | 26.1% | 27 | 22.7% | 35 | 29.4% | 14 | 11.8% |
| 2 | Culture and Social Norms has helped the improvement of the financial status of our company | 16 | 13.4% | 29 | 24.4% | 35 | 29.4% | 27 | 22.7% | 12 | 10.1% |

**Source: Field Survey, 2021**

The impact of culture and social norms on ICT companies was measured by gaining the respondents level of agreement and disagreement on two statements. 14 respondents or

11.8% strongly agreed that culture and social norms have helped their company to introduce new product and services, while 35 respondent or 29.4% agreed and 27 respondent or 22.7% had neutral opinion.

On the other hand, 12 respondents or 10.1% strongly agreed that culture and social norms have helped their company to improve their financial status, 27 respondents or 22.7% agreed, and 35 respondent or 29.4% had neutral opinion.

Based on the survey result it may be concluded that the ICT owners are not convinced that culture and social norms has helped their companies to introduce new product and services and to improve their financial status.

### 4.4.3. Descriptive statistical interpretation of firm performance variables

The overall ICT companies performance with an emphasise in the innovation performance, is measured by four dimensions such as introduction of a new or significantly improved product, profitability, growth and efficiency with a total of 10 Likert type items that were combined to compose a Likert Scale Type data. The overall performance in this study, as mentioned above is a dependent variable. Below, there have been presented in tabular form the results of each of the components of the overall performance.

#### 4.4.3.1. Descriptive statistics of the firm performance variable – Firm's introduction of new or significantly improved product

Firm's introduction of new or significantly improved product is measured by 1 Likert type item with responses ranging from 1 – Strongly Disagree to 5 – Strongly Agree. The results of this item have been presented in the Table 19.

*Table 19. Descriptive Statistics for Firm's Introduction of New or Improved Product*

| Number of items | Firm's introduction of new or significantly improved product | Strongly Disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % |
| **1** | During the last three years my company has introduced new products and services in the market | 0 | 0.0 % | 4 | 3.4 % | 26 | 21.8 % | 43 | 36.1 % | 46 | 38.7 % |

**Source: Field Survey, 2021**

To measure this variable, the respondents were asked if during the last three years their company has introduced new products and services in the market. 46 respondents or 38.7% strongly agreed to the statement, 43 respondents or 36.1% agreed and 26 respondents or 21.8% had neutral opinion.

Findings show that generally the answer is very related positively indicating that most of the surveyed ICT companies have introduced new products and services during the last three years.

#### 4.4.3.2. Descriptive statistics of the firm performance variable – Profitability

The variable of profitability is measured by 3 Likert type items with responses ranging from 1 – to Strongly Disagree to 5 – Strongly Agree. The results of this variable measure are presented in the Table 20.

*Table 20. Descriptive Statistics for Profitability*

| Number of items | Profitability | Strongly Disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % |
| **1** | My company is normally satisfied with Net Income / Revenues | 0 | 0.0% | 3 | 2.5% | 15 | 12.6% | 66 | 55.5% | 35 | 29.4% |
| **2** | My company is normally satisfied with profit margin - PM | 0 | 0% | 6 | 5% | 21 | 17.6% | 53 | 44.5% | 39 | 32.8% |
| **3** | My company is normally satisfied with Economic Value Added | 1 | 0.8% | 5 | 4.2% | 27 | 22.7% | 45 | 37.8% | 41 | 34.5% |

**Source: Field Survey, 2021**

Profitability is a common variable to measure the overall firm performance. In order to measure profitability of ICT companies that were part of this study, the respondent were asked to give their level of disagreement and agreement to three statements about net income, profit margin and economic value added. In the first statement, the respondents were asked to give their opinion whether their company is normally satisfied with net income/revenues. 35 respondents or 29.4% strongly agreed to the statement, 66 respondents or 55.5% agreed, and 15 respondents or 12.6% had neutral opinion. As for the profit margin, the respondents were asked to give their opinion if their company is normally satisfied with profit margin. In this statement 39 respondents or 32.8% strongly agreed, 53 respondents or

44.5% agreed and 21 respondents or 17.6% had neutral opinion. In the last statement, the respondent were asked if their company is satisfied with their economic value added. 41 respondents or 34.5% strongly agreed that their company is satisfied with their economic value added. 45 respondents or 37.8% agreed to this statement and 27 or 22.7% had neutral opinion.

The results from the Table 20 implies that the answers of the respondents are mostly directed to strongly agree and agree columns, indicating that the ICT surveyed companies are highly satisfied with their economic value added.

#### 4.4.3.3. Descriptive statistics of the firm performance variable – Growth

The variable of growth is measured by 3 Likert type items with responses ranging from 1 – Strongly Disagree to 5 – Strongly Agree. The results are shown in the Table 21.

*Table 21. Descriptive Statistics for Growth*

| Number of items | Growth | Strongly Disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % |
| 1 | My company is normally satisfied with market-share growth | 1 | .8% | 5 | 4.2% | 26 | 21.8% | 54 | 45.4% | 33 | 27.7% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **2** | My company is normally satisfied with net income growth | 0 | 0% | 4 | 3.4% | 23 | 19.3% | 51 | 42.9% | 41 | 34.5% |
| **3** | My company is normally satisfied with number of employees growth | 2 | 1.7% | 10 | 8.4% | 32 | 26.9% | 42 | 35.3% | 33 | 27.7% |

**Source: Field Survey, 2021**

In order to collect the opinion of the respondents toward their company growth performance, they were asked to give their level of agreement and disagreement on three statements. In the first statement, they were asked to give their opinion whether their company is normally satisfied with its market-share growth. 33 respondents or 27.7% strongly agreed that their company is satisfied with its market-share growth. 54 respondents or 45.4% agreed to that statement and 26 respondents or 21.8% had neutral opinion. In the second statement the respondents were asked to give their opinion whether their company is normally satisfied with its net income growth. In this statement, 41 respondents or 34.5% strongly agreed, 51 respondents or 42.9% agreed and 23 respondents or 19.3% had neutral opinion. In the last statement about the growth performance, the surveyed ICT companies were asked if they are normally satisfied with their number of employees' growth. 33 respondents or 27.7% strongly agreed to that statement, 42 respondents or 35.3% agreed and 32 respondents or 26.9% ahd neutral opinion.

The collected results about the companies' growth performance show that most of the ICT companies are satisfied with their growth.

#### 4.4.3.4. Descriptive statistics of the firm performance variable – Efficiency

Efficiency is measured by 3 Likert type items with responses ranging from 1 – Strongly Disagree to 5 – Strongly Agree. The results are shown in the Table 22.

*Table 22. Descriptive Statistics for Efficiency*

| Number of items | Efficiency | Strongly Disagree | | Disagree | | Neutral | | Agree | | Strongly Agree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % |
| **1** | My company is normally satisfied with return on investment | 1 | .8% | 1 | 0.8% | 21 | 17.6% | 54 | 45.4% | 42 | 35.3% |
| **2** | My company is normally satisfied with return on equity | 0 | 0% | 4 | 3.4% | 20 | 16.8% | 60 | 50.4% | 35 | 29.4% |
| **3** | My company is normally satisfied with return on assets | 0 | 0% | 2 | 1.7% | 29 | 24.4% | 48 | 40.3% | 40 | 33.6% |

**Source: Field Survey, 2021**

To measure the level of agreement and disagreement of surveyed ICT companies about their companies' efficiency, there have been added three statements about return on investment, return on equity and return on assets. In the first statement the respondent were asked to express their level of agreement whether their company is normally satisfied with their companies' return on investment. 42 respondent or 35.3% strongly agreed to that statement, 54 respondents or 45.4% agreed and 21 respondents or 17.6% had neutral

opinion. In the second statement the respondent were asked to express their level of agreement whether their company is normally satisfied with return on equity. 35 respondents or 29.4% strongly agreed to that statement, 60 respondents or 50.4% agreed, and 20 respondents or 16.8% had neutral opinion. In the third statement the respondents were asked to show their level of agreement whether their company is normally satisfied with its return on assets. 40 respondents or 33.6% strongly agreed to that statement, 48 respondents or 40.3% agreed, and 29 respondents or 24.4% had neutral opinion.

The results presented in the Table 22 show that the responses are highly correlated to positive answers indicating that the surveyed ICT companies are normally satisfied with their efficiency performance.

### 4.4.4. Descriptive statistical interpretation of the new computed variables

*Table 23. Descriptive Statistics for computed variables*

| Number of items | Computed Variables | Observations | Mean | Std. Deviation | Min | Max |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| **1** | Research Institutions and Universities | 119 | 3.73 | 0.88 | 1 | 5 |
| **2** | Government | 119 | 3.12 | 1.28 | 1 | 5 |
| **3** | Financial Institutions | 119 | 3.38 | 1.16 | 1 | 5 |
| **4** | Start-ups and Enterprises | 119 | 3.80 | 1.01 | 1 | 5 |
| **5** | Non-government Organizations | 119 | 3.50 | 1.15 | 1 | 5 |
| **6** | Incubators and Accelerators | 119 | 3.03 | 1.08 | 1 | 5 |
| **7** | Culture and Social Norms | 119 | 2.99 | 1.16 | 1 | 5 |
| **8** | Overall Firm Innovation Performance | 119 | 4.03 | 0.76 | 2 | 5 |

**Source: SPSS Output. v. 22, 2021**

The results from the Table 23 shows that the mean value ranges from the lowest value of 2.99 to the highest of 4.03. The standard deviation ranges from 0.76 to 1.28.

## 4.5. Inferential statistical interpretation of data – correlation and regression analysis

### 4.5.1. Correlation analysis of variables

Prior to above steps taken in this study, it is found necessary to know whether it is exist a relationship between variables incorporated in the study. The Correlation Analysis has been

found to be the most suitable and profound measure of the relationship of variables. There are different types of measuring correlation differing from the type of scaled measure of variables. In this study it is used the Pearson's Correlation. The correlation coefficient takes the letter 'r' and the values ranges from -1 to +1. The ideal positive correlation takes value +1, on the other hand, -1 stands for ideal negative correlation. As Walliman (2011) explains, the values between those to perfect negative and positive correlation show a weaker positive or negative correlation, while the rare cases may have a zero-value correlation, which show a perfect independent correlation. Even though there is no specific categorization of values to assign the strength of correlation, in the Table 24 there is shown a guideline with the correlation categories and their respected strength of correlation.

*Table 24. Guideline for Pearson Correlation coefficient*

| Coefficient Value | Strength of Association |
|---|---|
| **0.1 < r < 0.3** | Small Correlation |
| **0.3 < r < 0.5** | Moderate Correlation |
| **r> 0.5** | Strong Correlation |

**Source: Benesty et al. (2009)**

The base objective of this study is to measure the impact between Innovation Ecosystem actors and Overall Firm Innovation Performance. As consequence, the correlation analysis is considered an indispensable method to measure the significance of correlation between the computed variables of this study. The results are presented in the table below:

*Table 25. Correlation Analysis*

**Correlations**

| | | Research Institutions and Universities | Government | Financial Institutions | Start-ups and Enterprises | Non-government organizations | Incubators and Accelerators | Culture and Social Norms |
|---|---|---|---|---|---|---|---|---|
| Research Institutions and Universities | Pearson Correlation | 1 | | | | | | |
| | Sig. (2-tailed) | | | | | | | |
| Government | Pearson Correlation | .301** | 1 | | | | | |
| | Sig. (2-tailed) | .001 | | | | | | |
| Financial Institutions | Pearson Correlation | .433** | .550** | 1 | | | | |
| | Sig. (2-tailed) | .000 | .000 | | | | | |
| Start-ups and Enterprises | Pearson Correlation | .317** | .354** | .367** | 1 | | | |
| | Sig. (2-tailed) | .000 | .000 | .000 | | | | |
| Non-government organizations | Pearson Correlation | .459** | .560** | .421** | .523** | 1 | | |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | | | |
| Incubators and Accelerators | Pearson Correlation | .455** | .465** | .478** | .407** | .683** | 1 | |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | | |
| Culture and Social Norms | Pearson Correlation | .175* | .666** | .457** | .352** | .552** | .422** | 1 |
| | Sig. (2-tailed) | .057 | .000 | .000 | .000 | .000 | .000 | |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (1-tailed).

**Source: SPSS Output. v. 22, 2021**

The results from the Table 25 shows that all correlation coefficients between variables of this study show a moderate to positive correlation. The Pearson Correlation between Research Institutions and Universities and Government is 0.301, which indicates there is a moderate relationship between these two variables. The Correlation Coefficient between Research Institutions and Universities and Financial Institutions is 0.433, Research Institutions and Universities and Start-ups and Enterprises is 0.317, Research Institutions and Universities

and Non-government Organizations is 0.459, Research Institutions and Universities and Incubators and Accelerators is 0.455, all showing a moderate relationships among these variables. The correlation between Research Institutions and Universities and Culture and Social norms show a small relationship with a result of 0.175. The Pearson Correlation between Government and Financial Institutions is 0.550, Government and Non-government Organizations is 0.560, Government and Culture and Social Norms is 0.666, all showing a high positive relationship between these variables. The Correlation Coefficient between Government and Start-ups and Enterprises is 0.354, Government and Incubators and Accelerators is 0.465, showing moderate relationship between these two relationships. A moderate relationship exist between Financial Institutions and the following variables: Start-ups and Enterprises, Non-government Organizations, Incubators and Accelerators, and Culture and Social Norms with the respective coefficient results: 0.367, 0.421, 0.478 and 0.457. The Pearson Correlation between Start-ups and Enterprises and Non-government Organizations show a high relationship with a result of 0.523. The Correlation Coefficient between Start-ups and Enterprises and Incubators and Accelerators is 0.407, between Start-ups and Enterprises and Culture and Social Norms is 0.352. These two relationships show a moderate correlation. A high Correlation Coefficient exist between Non-government Organizations and Incubators and Accelerators, and also Culture and Social Norms with the respective results of 0.683 and 0.552. The Pearson Correlation between Incubators and Accelerators and Culture and Social Norms show a moderate relationship with the result of 0.422. The results also show that p-value for all correlations are less than the significance level of $p<0.05$ which indicates that all the correlations are significant. Based on this significant association among all the study variables we can continues further with the regression

analysis which will help to understand the statistical relationship between variables and explain the cause and effect relationship of variables of the study.

To give a clearer picture of the functioning and interconnection of the actors of the innovation ecosystem, the author has enriched the Model of Heptagon proposed earlier in the study with the data obtained from the correlation analysis and processed in SPSS. The values presented in the inner segments of the heptagon represent the correlation that exists between the actors of the innovation ecosystem studied in this research. In the following figure, it can be seen the output results of this correlation.

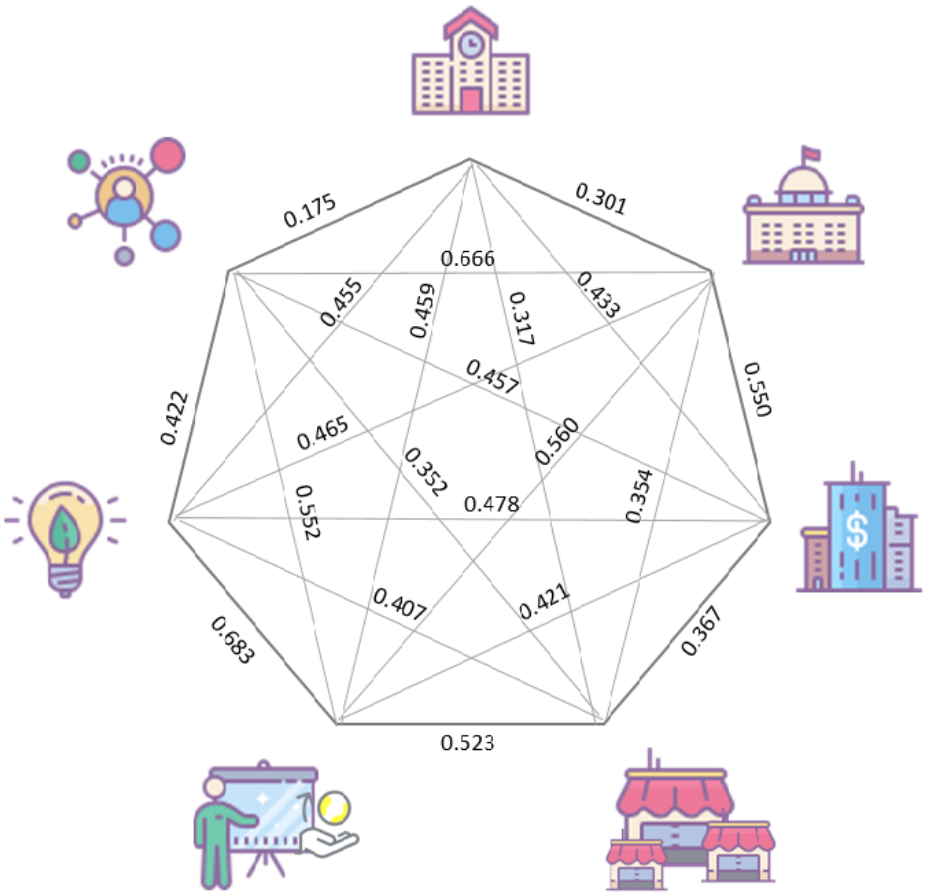


*Figure 23. Heptagon Cooperation Model of IE Actors with Correlation Metrics*

**Source: Candidate**

## 4.6. Regression analysis model

The purpose of this research, as mentioned in the above chapters, is to scientifically measure the impact that innovation ecosystem actors have on the performance of a company. To translate it in statistical terms, the purpose of this scientific research is to measure the impact that independent variables have on dependent variables. Since the relationships between independent and dependent variables were elaborated in the previous chapter through correlation analysis, a deep impact analysis was impossible to be conducted. Due to these statistical limitations, the research has been expanded to another scale - regression analysis. Regression analysis is considered as the most adequate and necessary model to help us explain this impact relationship between the two types of variables mentioned in the paper.

Regression analysis can be performed on two types – simple and multiple regression analysis. As Marczyk et al. (2005) and Jackson (2015) explain simple regression analysis is

commonly used to predict the values of the dependent variable by a single independent variable; on the other hand, multiple regression analysis commonly uses more than two independent variables to forecast the value of the dependent variable. The simple regression analysis model may be shown in the following formula:

$$Y_i = \beta_0 + \beta_1 X_1 + u_i$$

Where:

Y is the dependent variable

X is the independent variable

$\beta_0$ is the regression constant (regression intercept)

$\beta_1$ is the regression coefficient,

$u_i$ is the error term

The vast majority of cases in practice have two or more independent variables. In those cases, the simple regression analysis would be insufficient and non-implementable statistical analysis. Therefore, the multiple regression analysis as the expansion of the simple regression analysis would be considered as the right type of regression analysis. In the following formula, it is shown the multiple regression model.

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_i X_i + u_i$$

Where:

$Y$ is the dependent variable

$X_1$, $X_2$, $X_i$ are the independent variable

$\beta_0$ is the regression constant (regression intercept)

$\beta_1$, $\beta_2$, $\beta_i$ are the regression coefficient,

$u_i$ is the error term

In this part of statistical analysis, it is also paid attention to the problem of 'multicollinearity'. It expresses the situation where there occur a high level of correlation between independent variables. A high degree of relationship among independent variables ($X_1$, $X_2$, $X_i$) represent less reliable regression coefficients ($\beta_1$, $\beta_2$, $\beta_i$) on an multiple regression analysis. As Kothari (2004) suggests in order to avoid this problem and to make correct estimations, only a set of independent variables should be incorporated in such situations as adding the second independent variable that is highly correlated to the first one may give unreliable regression outcomes.

### 4.6.1. Regression model of the study

The model used in this study is derived from the study objectives and hypotheses and may be formulated as follow:

***Overall Firm Innovation Performance = f (Innovation Ecosystem Actors)***

Where, the overall firm innovation performance as the dependent variable is measured by four variables in this study, as follow:

1. Firm's introduction of new or significantly improved product (INIP)
2. Profitability (PRF)
3. Growth (GRTH)
4. Efficiency (EFF)

Correspondingly, the innovation ecosystem as independent variables has seven variables, which are:

1) Research institutions and universities (RD)
2) Government (GOV)
3) Financial Institutions (FIN)
4) Start-ups and enterprises (CO)
5) Non-government organizations (NGO)
6) Incubators and Accelerators (INC&AC)
7) Culture and social norms (CULT)

Consequently, the model for every dimension of firm performance can be formulated as follow:

1. ***INIP = ƒ ( RD, GOV, FIN, CO, NGO, INC&AC, CULT)***
2. ***PRF = ƒ ( RD, GOV, FIN, CO, NGO, INC&AC, CULT)***

3. ***GRTH = f ( RD, GOV, FIN, CO, NGO, INC&AC, CULT)***

4. ***EFF = f ( RD, GOV, FIN, CO, NGO, INC&AC, CULT)***

Presented in the form of multiple regression, the above relationship can be represented as below:

$$INIP=\beta_0 + \beta_1 RD + \beta_2 GOV + \beta_3 FIN + \beta_4 CO + \beta_5 NGO + \beta_6 INC\&AC + \beta_7 CULT + u_i$$

$$PRF= \beta_0 + \beta_1 RD + \beta_2 GOV + \beta_3 FIN + \beta_4 CO + \beta_5 NGO + \beta_6 INC\&AC + \beta_7 CULT + u_i$$

$$GRTH=\beta_0 + \beta_1 RD + \beta_2 GOV + \beta_3 FIN + \beta_4 CO + \beta_5 NGO + \beta_6 INC\&AC + \beta_7 CULT + u_i$$

$$EFF=\beta_0 + \beta_1 RD + \beta_2 GOV + \beta_3 FIN + \beta_4 CO + \beta_5 NGO + \beta_6 INC\&AC + \beta_7 CULT + u_i$$

Where:

INIP – Firm's introduction of new or significantly improved product

PRF – Profitability

GRTH - Growth

EFF - Efficiency

RD - Research institutions and universities

GOV - Government

FIN - Financial Institutions

CO - Start-ups and enterprises

NGO - Non-government organizations

INC&AC - Incubators and Accelerators

CULT - Culture and social norms

$\beta_0$ – regression constant (regression intercept)

$\beta_1$, $\beta_2$, $\beta_3$, $\beta_4$, $\beta_5$, $\beta_6$, $\beta_7$ – regression coefficients

$u_i$ – error term

To examine the impact of the independent variables on the four dimensions of firm innovative performance researched in this study, a new model that will measure the overall firm innovative performance was developed. The new developed model used the mean of the total sum of all the four performance dimensions by deriving a new dependent variable. This relationship among the newly created dependent variable and the seven independent variables may be shown in the following model:

$$\textbf{OFIP=}\ \boldsymbol{\beta_0 + \beta_1 RD + \beta_2 GOV + \beta_3 FIN + \beta_4 CO + \beta_5 NGO + \beta_6 INC\&AC + \beta_7 CULT + u_i}$$

Where Overall Firm Innovative Performance (OFIP) represents the average of the combined values of Firm's introduction of new or significantly improved product (INIP), Profitability (PRF), Growth (GRTH) and Efficiency (EFF).

A priori expectations of β coefficients based on the study hypotheses will be as follow:

**$H_0$: $\beta_1 = 0$ $H_1$: $\beta_1 > 0$**

**$H_0$: $\beta_2 = 0$ $H_2$: $\beta_2 > 0$**

**$H_0$: $\beta_3 = 0$ $H_3$: $\beta_3 > 0$**

**$H_0$: $\beta_4 = 0$ $H_4$: $\beta_4 > 0$**

**$H_0$: $\beta_5 = 0$ $H_5$: $\beta_5 > 0$**

**$H_0$: $\beta_6 = 0$ $H_6$: $\beta_6 > 0$**

**$H_0$: $\beta_7 = 0$ $H_7$: $\beta_7 > 0$**

In accordance with the hypothesis above, a priori expectation is that all the regression coefficients will show greater values than zero, implying that all the independent variables are expected to have positive impact on the Overall Firm Innovation Performance.

The study hypothesis will be tested using the Multiple Regression Analysis, from which there will be derived the regression table and summary statistic as two very important outputs of this analysis. In the regression table it is shown the R-squared value as according to Singh (2007), indicate the impact of all independent variables together and always takes values between 0 to 1, with value closer to 0 indicating a model that explains the poor model fit while values closer to 1 indicating perfect fit. To test the hypothesis there have been used the values from the regression table in the column of significance or p-values which have helped to accept or reject the formulated null hypothesis prior in the study. Furthermore, in the regression table there are show also the regression coefficients as according to Singh (2007) these values represent the contribution of each sole independent variable on the value of the dependent variable.

**4.6.2. Test of hypotheses**

As mentioned above, the regression analysis has been conducted to test the hypotheses of this study. Consequently, in order to test the impact of Research institutions and universities (RD), Government (GOV), Financial Institutions (FIN), Start-ups and Enterprises (CO), Non-government Organizations (NGO), Incubators and Accelerators (INC&AC), Culture and Social Norms (CULT) and Overall Firm Innovation Performance (OFIP) the multiple regressions were executed based on the following model:

$$\textbf{OFIP=}\ \beta_0 + \beta_1 RD + \beta_2 GOV + \beta_3 FIN + \beta_4 CO + \beta_5 NGO + \beta_6 INC\&AC + \beta_7 CULT + u_i$$

The table below gives the results of the multiple regression analysis:

*Table 26. Multiple Regression Analysis*

| Coefficients[a] | | | | | | |
|---|---|---|---|---|---|---|
| **Model** | | Unstandardized Coefficients | | Standardized Coefficients | | |
| | | **B** | **Std. Error** | **Beta** | **t** | **Sig.** |
| **1** | (Constant) | 2.086 | .304 | | 6.864 | .000 |
| | RD | .180 | .081 | .209 | 2.220 | .028 |
| | GOV | -.048 | .068 | -.082 | -.712 | .478 |
| | FIN | -.008 | .067 | -.012 | -.118 | .907 |
| | CO | .196 | .070 | .260 | 2.818 | .006 |
| | NGO | .054 | .084 | .081 | .639 | .524 |
| | INCAC | .193 | .078 | .275 | 2.469 | .015 |
| | CULT | -.021 | .073 | -.032 | -.289 | .773 |
| **a. Dependent Variable: OFIP** | | | | | | |
| ***$R^2$=0.339, Adjusted $R^2$=0.298*** | | | | | | |

**Source: SPSS Output. v. 22, 2021**

The coefficient of determination R-squared of this study is 0.339 or 33.9%. This indicates that 33.9% of the variations in the model are explained by the explanatory variables of the model of the study while 66.1% can be attributed to unexplained variations comprehended by the error term. The rules of the R-squared results varies from the research area of study. This can be justified in human and social sciences since the human behaviour are hardly to be accurately predicted. According to Cohen (1988, 1992), the coefficient of determination ($R^2$) for linear regression of 0.339 which falls in the categorization $R^2$ >= 0.26 is a substantial result of this coefficient. In the table below there have been shown the categorization of $R^2$ results.

*Table 27. Guideline for $R^2$ regression coefficient*

| Coefficient Value | Interpretation |
|---|---|

| | |
|---|---|
| **$R^2$ < 0.02** | Very weak |
| **0.02 <= $R^2$ < 0.13** | Weak |
| **0.13 <= $R^2$ < 0.26** | Moderate |
| **$R^2$ >= 0.26** | Substantial |

**Source: Cohen (1988)**

As seen in the Table 25, the regression analysis gives the β coefficients for each independent variable of this study. In the following section, the resulted coefficients will be interpreted for every independent variable in particular in contrast to the a priori assumption that all β coefficients are expected to be larger than 0.

1. **Research institutions and universities:** the outcome of the regression analysis shows that there is a positive relationship between Research Institutions and Universities (RD) and Overall Firm Innovation Performance (OFIP). Furthermore, it can be noticed that the result is not in line with a priori assumption that $\beta_1 > 0$. This result mean that a unit increase in research institutions and universities (RD) will result in an increase in Overall Firm Innovation Performance (OFIP) by 0.180 units.

2. **Government:** a negative relationship exists between Government (GOV) and Overall Firm Innovation Performance (OFIP). The results from the regression table show that the regression results from this variable is not in the line with the a priori assumption that $\beta_2 > 0$. This means that a unit icrease in Government (GOV) will result in a decrease in Overall Firm Innovation Performance (OFIP) by 0.048 units.

3. **Financial Institutions:** regression results show a negative relationship between Financial Institutions (FIN) and Overall Firm Innovation Performance (OFIP). The a priori assumption that $\beta_3 > 0$ is not confirmed, meaning that a unit increase in Financial Institutions (FIN) will result in a decrease in Firm Innovation Performance (OFIP) by 0.008 units.

4. **Start-ups and enterprises:** there is a positive relationship between Start-ups and Enterprises (C) and Overall Firm Innovation Performance (OFIP). The result show that the coefficient for Start-ups and Enterprises (C) are in line with a priori assumption that $\beta_4 > 0$. This means that a unit increase in Start-ups and Enterprises (C) will result in an increase of 0.196 units in Overall Firm Innovation Performance (OFIP).

5. **Non-government organizations:** regression results show that there is a positive relationship between Non-government Organizations (NGO) and Overall Firm Innovation Performance (OFIP). The coefficient for this variable is in line with a priori assumption that $\beta_5 > 0$. This means that a unit increase in Non-government Organizations (NGO) will result with a increase in Overall Firm Innovation Performance (OFIP) by 0.054 units.

6. **Incubators and Accelerators:** there is a positive relationship between Incubators and Accelerators (INCAC) and Overall Firm Innovation Performance (OFIP). The regression result show that a priori assumption that $\beta_6 > 0$ is confirmed. Furthermore this result show that a unit increase in Icubators and Accelerators (INCAC) will result in an increase on 0.193 units in Overall Firm Innovation Perfrormance (OFIP).

7. **Culture and social norms:** a negative relationship exist between Culture and Social Norms (CULT) and Overall Firm Innovation Performance (OFIP). The result show that the coefficient of regression for Culture and Social Norms (CULTS) are not in line with a priori assumption that $\beta_7 > 0$. Furthermore, we can conclude that a unit increase in Culture and

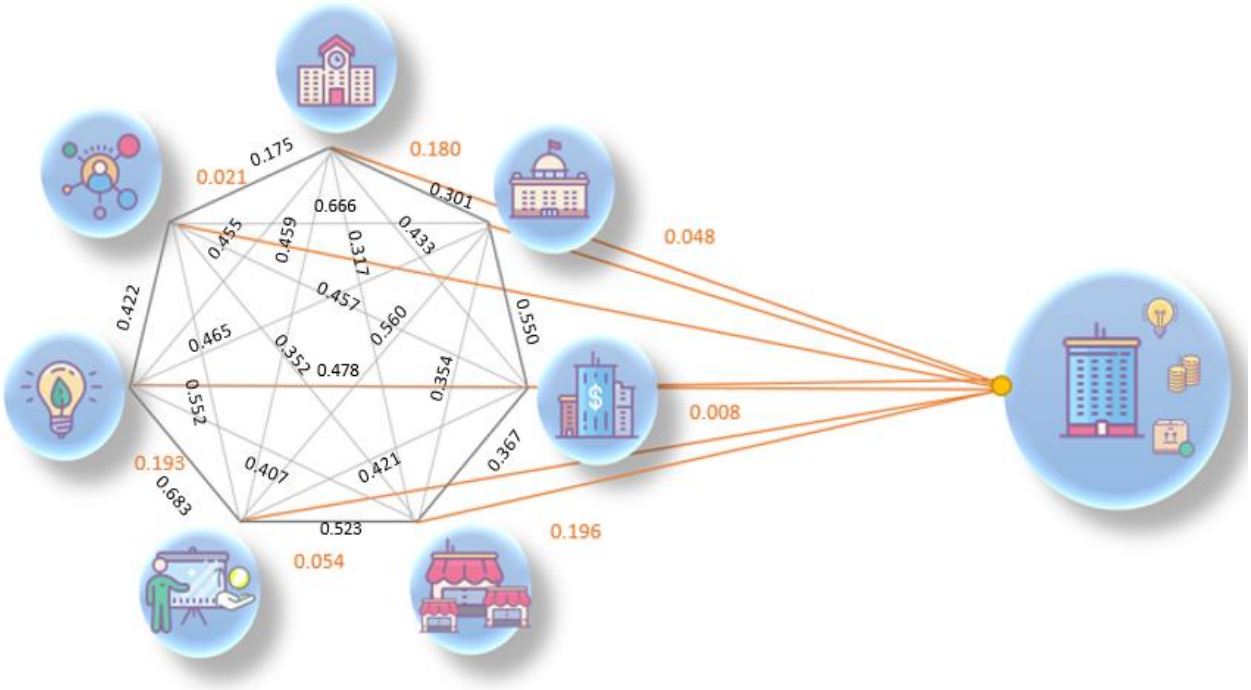
Social Norms will reseult in a decrease of 0.021 units in Overall Firm Innovation Performance (OFIP).

According to the regression results, the regression model of this study may be presented as follows:

***OFIP= 2.086+0.180RD-0.048GOV-0.008FIN+0.196CO+0.054NGO+0.193INCAC-0.021CULT***

In the following figure, the author of the paper has built a model that will show in graphical form the metrics of correlation and regression analysis. In this way, the author tries to give a clearer picture about the cooperation and influence that exist between innovation ecosystem actors, and their sole impact on the overall firm innovation performance. As mentioned before, this model is an extended form of the Heptagon Model of IE Actors, and in such form, it may be used in other research in the same field of study. The following metrics are represented in the below figure.

*Figure 24. The heptagonal cooperation-influence model of innovation ecosystem actors on firm's innovation and new product development with Metrics*




**Source: Candidate**

Proceeding further, the above regression result was used to test the seven hypothesis of this study.

#### 4.6.2.1. Test of hypothesis one

*$H_0$: Research institutions and universities have no significant impact on overall firm innovation performance.*

*$H_1$: Research institutions and universities have significant impact on overall firm innovation performance.*

The regression analysis result shown in the Table 25 indicate that the p-value for the independent variable Research Institutions and Universities (RD) is 0.028 < 0.05, which reaches statistical significance. Furthermore, t value of this variable is 2.220, which positively surpasses the critical value of 1.6579, which led to a conclusion that at 95% confidence level Research Institutions and Universities (RD) have a significantly positive impact on Overall Firm Innovation Performance (OFIP). According to the above analysis derived from the regression table, we can reject the null hypothesis and confirm the alternative hypothesis that claims that Research Institutions and Universities have significant impact on the Overall Firm Innovation Performance.

**4.6.2.2. Test of hypothesis two**

*$H_0$: Government has no significant impact on overall firm innovation performance.*

*$H_2$: Government has significant impact on overall firm innovation performance.*

The above results show that the p-value for the independent variable Government (GOV) is 0.478 > 0.05, which show no evidence of significant, impact of this variable on Overall Firm Innovation Performance (OFIP). The t value is also less than its critical value of 1.6579 and confirm that 95% confidence level Government has no significant impact on Overall Firm Innovation Performance. Therefore, the findings fail to accept the alternative hypothesis,

consequently confirming the null hypothesis that the Government has no significant impact on the Overall Firm Innovation Performance.

#### 4.6.2.3. Test of hypothesis three

*$H_0$: Financial Institutions have no significant impact on overall firm innovation performance.*

*$H_3$: Financial Institutions have significant impact on overall firm innovation performance.*

Regression results show that the p-value for the independent variable Financial Institutions (FIN) is 0.907 > 0.05, which shows no evidence of significant impact on Financial Institutions on the Overall Firm Innovation Performance (OFIP). The t value is less than its critical value of 1.6579 allowing to conclude that at 95% confidence level Financial Institutions have no significant impact on the Overall Firm Innovation Performance (OFIP). Therefore, the findings reject the alternative hypothesis giving no other option that to confirm the null hypothesis that Financial Institutions have no significant impact on the Overall Firm Innovation Performance.

#### 4.6.2.4. Test of hypothesis four

*$H_0$: Cooperation with other start-ups and enterprises has no significant impact on overall firm innovation performance.*

*$H_4$: Cooperation with other start-ups and enterprises has significant impact on overall firm innovation performance.*

The above results show that the p-value for the independent variable Cooperation with other Start-ups and Enterprises (CO) is 0.006 < 0.05 which reaches the statistical significance. Furthermore, the t value is 2.818 and positively surpasses the critical value of 1.6579, which led to conclusion that at 95% confidence level Cooperation with other Start-ups and Enterprises positively impacts the Overall Firm Innovation Performance. Based on the results mentioned before, we can confirm the alternative hypothesis that claims that Cooperation with other Start-ups and Enterprises has significant impact on the Overall Firm Innovation Performance and hence rejects the null hypothesis.

**4.6.2.5. Test of hypothesis five**

*$H_0$: Non-government organizations and development agencies have no significant impact on overall firm innovation performance.*

*$H_5$: Non-government organizations and development agencies have significant impact on overall firm innovation performance.*

The regression result show that the p-value of the independent variable Non-government Organizations and Development Agencies (NGO) is 0.524 > 0.05, which shows no

evidence of significant impact of this variable on the Overall Firm Innovation Performance (OFIP). The t value is 0.639 and is less than its critical value of 1.6579 allowing to claim that at 95% confidence level Non-government Organizations and Development Agencies have no significant impact on the Overall Firm Innovation Performance (OFIP). As a result, the alternative hypothesis is rejected whereas the null hypothesis that Non-government Organizations and Development Agencies have no significant impact on the Overall Firm Innovation Performance is confirmed.

#### 4.6.2.6. Test of hypothesis six

> *$H_0$: Incubators and Accelerators have no significant impact on overall firm innovation performance.*
>
> *$H_6$: Incubators and Accelerators have significant impact on overall firm innovation performance.*

The above regression results show that the p-value for the independent variable Incubators and Accelerators (INCAC) is 0.015 < 0.05, which shows that it reaches the statistical significance on the Overall Firm Innovation Performance (OFIP). The t value is 2.469 and positively surpasses the critical value of 1.6579, therefore it can be claimed that at 95% confidence level Incubators and Accelerators positively impact the Overall Firm Innovation Performance. In accordance with the results above, we can confirm the alternative hypothesis that claims that Incubators and Accelerators have significant impact on the overall firm innovation performance and hence reject the null hypothesis.

#### 4.6.2.7. Test of hypothesis seven

*$H_0$: Culture and social norms have no significant impact on overall firm innovation performance.*

*$H_7$: Culture and social norms have significant impact on overall firm innovation performance.*

The regression results show that the p-value for the independent variable Culture and Social Norms (CULT) is 0.773 > 0.05 which indicate that there is no significant impact of Culture and Social Norms on the Overall Firm Innovation Performance (OFIP). The t value is less than it critical value of 1.6579 and shows that at 95% confidence level Culture and Social Norms have no significant impact on the Overall Firm Innovation Performance. As a result, the alternative hypothesis is rejected whereas the null hypothesis is confirmed allowing to conclude that Culture and Social Norms have no impact on the Overall Firm Innovation Performance.

## 4.7. Dominance statistical analysis

As seen from the correlation and regression analysis, in this study there has been measured and tested the impact of combined independent variables on the overall firm innovation performance. Although, in this section of study, it has been seen useful to determine the sole relative importance of the predictors of the model used in this study. As mentioned before, in the previous statistical analysis, there have been measured the impact of all Innovation Ecosystem Actors on the Overall Firm Innovation Performance. In this section through Ranking Analysis, it will be measures the relative impact of every IE actor individually on the dependent variable based on the regression model that has been used in this study. The results have been derived by calculating Partial Analysis on the Correlation Model. The Partial Results have been taken from the each IV, and then these results have been squared and then there has been conducted the ranking analysis from the largest result to the smallest. The partial statistics taken into consideration on this section measure the change in the $R^2$ by dropping each one IV variable repeatedly to see their impact on the DV. The results are presented in the table below.

*Table 28. IV Dominance Analysis*

| Performance | Part Correlation | Squared Part Correlation (^2) | Ranking |
|---|---|---|---|
| **CO** | 0.217 | 0.047089 | **1** |
| **INCAC** | 0.191 | 0.036481 | **2** |
| **RD** | 0.171 | 0.029241 | **3** |
| **GOV** | 0.055 | 0.003025 | **4** |
| **NGO** | 0.049 | 0.002401 | **5** |
| **CULT** | 0.022 | 0.000484 | **6** |
| **FIN** | 0.009 | 0.000081 | **7** |

**Source: SPSS Output. v. 22, 2021**

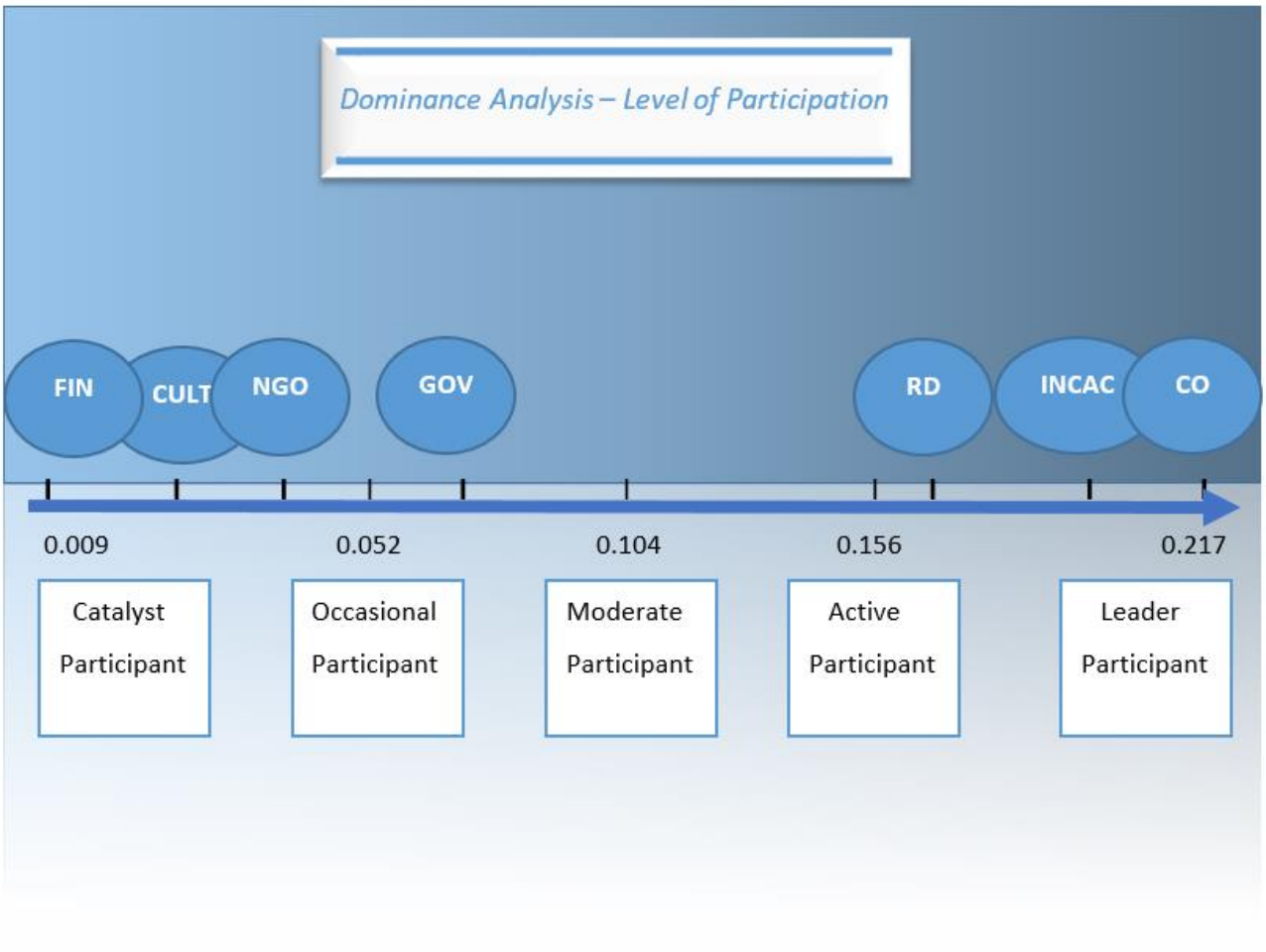
Based on the above results presented in the Table 28, Cooperation with other Start-ups and Enterprises resulted as the most important IE actor regarding to the Overall Firm Innovation Performance, followed by Incubators and Accelerators, Research Institutions and Universities, Government, Non-government Organizations, Culture and Social Norms and Financial Institutions.

In the following figure, the author of the paper has built a chart showing in graphical form the dominance results of the Innovation Ecosystem Actors of this study. The author, through this graphical form, tries to build a model that can be applicable to further studies in this field.

The results from the dominance analysis are taken to be processed and to give the final product seen in the figure below. The two results in the lower limit and the upper limit are taken as limiting results. The reason for this action lies in the fact that by taking the upper and lower limits it is better highlighted which actors of the innovative ecosystem are more dominant and which are not and how they stand in relation to each other.

Through this model, it is given a clear picture about an ecosystem that will help a lot to make the mapping of an innovative ecosystem and to give recommendations based on the impact or non-impact of the actors of that ecosystem. The author of the paper has categorized the level of the impact of the innovation ecosystem actors into five categories, starting from the actors with the lowest impact to the actors with the highest impact. The actors with the lowest impact has been categorized as Catalyst Participants, on the other hand, the actors with the highest impact has been categorized as Leader Participants. The results can be shown in the Figure 22.

*Figure 25. Dominance Analysis - Level of Participation*




**Source: Candidate**

# Chapter 5: SUMMARY

## 5.1. Introduction

In this chapter, it will be provided a comprehensive discussion of the results of this research. In addition, this chapter will also give a conclusion of the study. Furthermore, the implications and the limitations of this study will be emphasized and discussed, and the future research direction will be suggested.

## 5.2. Discussion

The globalization trends, such as technological development, dynamism in the circulation of goods and services, the emergence of new professions, have made the process of innovation in business come out of the closed box, and the openness of business actors as the dominant behaviour, bringing new concepts like, sharing economy, open innovation and innovation ecosystem. In recent decades, the innovation process has been shifted from a closed to a more open process. This has been achieved from the collaborations and innovation ecosystems approach and mind-set. Innovation ecosystems have been identified as unique opportunities for all stakeholders of the industry to actively engage in solving future challenges and opportunities. However, one thing is for sure, innovation, especially, in the stage of globalization and technological development, is the headline of every economy. In literature, an Innovation Ecosystem is described as a loosely interconnected network of companies and other entities that coevolve capabilities around a shared set of technologies, knowledge, or skills and work cooperatively and competitively to develop new products and services (Moore, 1993). This study has

examined the impact of the Innovation Ecosystem on firm innovation performance and the development of new products in the ICT sector in Kosovo. It is found that the Innovation Ecosystem, in general, has a significant impact on the overall firm innovation performance. Therefore, the general objective of this study was to determine the impact of the innovation ecosystem on product development and firm innovation performance in the ICT sector in Kosovo. Whereas the specific objectives were to measure the impact of each innovation ecosystem actor on product development and firm innovation performance in the ICT sector in Kosovo. As a result, each specific objective of this study was expressed through research hypothesis. Consequently, the discussion of the results will derive from the statistical analysis of the data collected of this study.

### 5.2.1. Impact of Research Institutions and Universities on Overall Firm Innovation Performance

The first specific objective of the study was to the impact of the IE actor – research institutions and universities on the overall firm innovation performance, where it was raised the hypothesis that *Research Institutions and Universities have a significant impact on overall firm innovation performance.* The outcome derived from the multiple regression analysis has produced the regression coefficient for Research Institutions and Universities of 0.180 showing that there is a positive relationship between Research Institutions and Universities (RD), on one hand, and Overall Firm Innovation Performance (OFIP), on the other hand. Furthermore, it can be noticed that the result is not in line with a priori assumption that $\beta_1 > 0$. This result mean that a unit increase in research institutions and universities (RD) will result in an increase in Overall Firm Innovation Performance (OFIP) by 0.180 units. In addition, the p-value for the independent variable Research Institutions and Universities (RD) is 0.028 <

0.05, which reaches statistical significance. Furthermore, t value of this variable is 2.220, which positively surpasses the critical value of 1.6579, which led to a conclusion that at 95% confidence level Research Institutions and Universities (RD) have a significantly positive impact on Overall Firm Innovation Performance (OFIP). According to the above analysis derived from the regression table, we can reject the null hypothesis and confirm the alternative hypothesis that claims that Research Institutions and Universities have significant impact on the Overall Firm Innovation Performance.

### 5.2.2. Impact of Government on Overall Firm Innovation Performance

The second specific objective was to measure the impact of the IE actor – government on the overall firm innovation performance, according to which the second hypothesis was raised claiming that *Government has a significant impact on overall firm innovation performance.* The results from the regression table shows a regression coefficient for Government of -0.48 indicating that a negative relationship exist between Government (GOV) and Overall Firm Innovation Performance (OFIP). The results from the regression table show that the regression results from this variable is not in the line with the a priori assumption that $\beta_2 > 0$. This means that a unit icrease in Government (GOV) will result in a decrease in Overall Firm Innovation Performance (OFIP) by 0.048 units. The p-value for the independent variable Government (GOV) is 0.478 > 0.05, which show no evidence of significant, impact of this variable on Overall Firm Innovation Performance (OFIP). The t value is also less than its critical value of 1.6579 and confirm that 95% confidence level Government has no significant impact on Overall Firm Innovation Performance. Therefore, the findings fail to accept the alternative

hypothesis, consequently confirming the null hypothesis that the Government has no significant impact on the Overall Firm Innovation Performance.

### 5.2.3. Impact of Financial Institutions on Overall Firm Innovation Performance

The third objective was to examine the impact of the Financial Institutions on Overall Firm Innovation Performance. This objective was measured by raising the hypothesis that *Financial Institutions have a significant impact on overall firm innovation performance.* The regression coefficient for Financial Institutions is -0.08 showing a negative relationship between Financial Institutions (FIN) and Overall Firm Innovation Performance (OFIP). The a priori assumption that $\beta_3 > 0$ is not confirmed, meaning that a unit increase in Financial Institutions (FIN) will result in a decrease in Firm Innovation Performance (OFIP) by 0.008 units. Regression results show that the p-value for the independent variable Financial Institutions (FIN) is 0.907 > 0.05, which shows no evidence of significant impact on Financial Institutions on the Overall Firm Innovation Performance (OFIP). The t value is less than its critical value of 1.6579 allowing to conclude that at 95% confidence level Financial Institutions have no significant impact on the Overall Firm Innovation Performance (OFIP). Therefore, the findings reject the alternative hypothesis giving no other option that to confirm the null hypothesis that Financial Institutions have no significant impact on the Overall Firm Innovation Performance.

### 5.2.4. Impact of Start-ups and Enterprises on Overall Firm Innovation Performance

The fourth objective of the study was to measure the impact of Start-ups and Enterprises on Overall Firm Innovation Performance, based on which the author raised the hypothesis that *Cooperation with other start-ups and enterprises has no significant impact on overall firm innovation performance.* The result form the regression table shows that the regression coefficient for Start-ups and Enterprises is 0.196, confirming that there is a positive

relationship between Start-ups and Enterprises (C) and Overall Firm Innovation Performance (OFIP). The result show that the coefficient for Start-ups and Enterprises (C) are in line with a priori assumption that $\beta_4 > 0$. This means that a unit increase in Start-ups and Enterprises (C) will result in an increase of 0.196 units in Overall Firm Innovation Performance (OFIP). The above results show that the p-value for the independent variable Cooperation with other Start-ups and Enterprises (CO) is 0.006 < 0.05 which reaches the statistical significance. Furthermore, the t value is 2.818 and positively surpasses the critical value of 1.6579, which led to conclusion that at 95% confidence level Cooperation with other Start-ups and Enterprises positively impacts the Overall Firm Innovation Performance. Based on the results mentioned before, we can confirm the alternative hypothesis that claims that Cooperation with other Start-ups and Enterprises has significant impact on the Overall Firm Innovation Performance and hence rejects the null hypothesis.

**5.2.5. Impact of Non-government Organizations on Overall Firm Innovation Performance**

In the fifth specific objective, the researcher aimed to examine the Impact of Non-government Organizations on Overall Firm Innovation Performance. To achieve this specific objective, the researcher raised the fifth hypothesis as follow: *Non-government organizations and development agencies have significant impact on overall firm innovation performance.* The regression results show that there is a positive relationship between Non-government Organizations (NGO) and Overall Firm Innovation Performance (OFIP). The coefficient for this variable is in line with a priori assumption that $\beta_5 > 0$. This means that a unit increase in Non-government Organizations (NGO) will result with an increase in Overall Firm Innovation Performance (OFIP) by 0.054 units. The p-value of the independent variable Non-government Organizations and Development Agencies (NGO) is 0.524 > 0.05, which shows no evidence of

significant impact of this variable on the Overall Firm Innovation Performance (OFIP). The t value is 0.639 and is less than its critical value of 1.6579 allowing to claim that at 95% confidence level Non-government Organizations and Development Agencies have no significant impact on the Overall Firm Innovation Performance (OFIP). As a result, the alternative hypothesis is rejected whereas the null hypothesis that Non-government Organizations and Development Agencies have no significant impact on the Overall Firm Innovation Performance is confirmed.

### 5.2.6. Impact of Incubators and Accelerators on Overall Firm Innovation Performance

Through the sixth research objective, the researcher aimed to measure the Impact of Incubators and Accelerators on Overall Firm Innovation Performance. This objective was tested through the sixth hypothesis claiming that *Incubators and Accelerators have significant impact on overall firm innovation performance.* The regression coefficient derived from the regression table provided a beta coefficient of 0.193 for incubators and accelerators indicating that there is a positive relationship between Incubators and Accelerators (INCAC) and Overall Firm Innovation Performance (OFIP). The regression result show that a priori assumption that $\beta_6 > 0$ is confirmed. Furthermore, this result show that a unit increase in Icubators and Accelerators (INCAC) will result in an increase on 0.193 units in Overall Firm Innovation Performance (OFIP). The above regression results show that the p-value for the independent variable Incubators and Accelerators (INCAC) is $0.015 < 0.05$, which shows that it reaches the statistical significance on the Overall Firm Innovation Performance (OFIP). The t value is 2.469 and positively surpasses the critical value of 1.6579, therefore it can be claimed that at 95% confidence level Incubators and Accelerators positively impact the Overall Firm Innovation Performance. In accordance with the results above, we can confirm

the alternative hypothesis that claims that Incubators and Accelerators have significant impact on the overall firm innovation performance and hence reject the null hypothesis.

### 5.2.7. Impact of Culture and Social Norms on Overall Firm Innovation Performance

The last specific objective of the study was to determine the Impact of Culture and Social Norms on Overall Firm Innovation Performance. In order to accomplish this objective, the hypothesis claiming that *Culture and social norms have significant impact on overall firm innovation performance* was raised. This hypothesis, like the previous ones have been tested running the multiple regression analysis. The regression coefficient for Culture and Social Norms has a result of -0.021 indicating that a negative relationship exist between Culture and Social Norms (CULT) and Overall Firm Innovation Performance (OFIP). The result show that the coefficient of regression for Culture and Social Norms (CULTS) are not in line with a priori assumption that $\beta_7 > 0$. Furthermore, we can conclude that a unit increase in Culture and Social Norms will reseult in a decrease of 0.021 units in Overall Firm Innovation Performance (OFIP). The regression results show that the p-value for the independent variable Culture and Social Norms (CULT) is 0.773 > 0.05 which indicate that there is no significant impact of Culture and Social Norms on the Overall Firm Innovation Performance (OFIP). The t value is less than it critical value of 1.6579 and shows that at 95% confidence level Culture and Social Norms have no significant impact on the Overall Firm Innovation Performance. As a result, the alternative hypothesis is rejected whereas the null hypothesis is confirmed allowing to conclude that Culture and Social Norms have no impact on the Overall Firm Innovation Performance.

## 5.3. Implications

As a new topic of study, the innovation ecosystem has attracted the attention of a wide number of scholars. Despite that, there is a limited number of empirical research in this field. The vast majority of the studies on this topic are of theoretical nature. Through this research, it is attempted to study a certain set of actors within the whole innovation ecosystem to get a more in-depth understanding of interactions taking place among the actors and give answers to the research hypotheses of the study. There is a limited effort in the contemporary scientific literature on systematizing the innovation ecosystem actors and measuring their impact with a special emphasis on innovation. This study tries to close the gap, through careful studying about this issue.

Moreover, to the best of my knowledge the concept of the innovation ecosystem, respectively the impact of the innovation ecosystem in the new product development and firm innovation performance is not studied at all in the region (Kosovo and its neighbouring countries) therefore this research will be the first study in this field. As a result, this study will fill a considerable gap in the regional literature and even will contribute to the gap in worldwide innovation ecosystem literature.

The scientific contribution of this study elaborated and researched above is on mapping, analysing, and proposing a Sustainable Innovation Ecosystem in Kosovo based on its competitive advantage and potential to generate knowledge-driven growth with the main purpose of helping the economic development. This research, among other contributions, will pave the way for recognition and acceptance the open innovation as a research field. It will also enhance sustainable consideration by decision-making actors and it will increase social awareness about resource usage. There are not many empirical studies conducted on this

topic even though in the last decade it has been a very attractive research field among the scientific community. The expected outcome of this research is to contribute to the gap in the literature by providing a first study that examines the impact of the innovation ecosystem on product development and firm innovation in Kosovo. Moreover, by answering the research hypothesis, this research fills the gap also in the international literature about this topic since there is a deficiency of empirical studies. Another scientific contribution will be on the presenting for the first time a tailor-made model of the author of the paper that can be used by other authors to research the cooperation of different ecosystems. This model is named as the Cross-industry Cooperation Model of a Sustainable Innovation Ecosystem. This model is an expanded form of the 'The heptagonal cooperation-influence model of innovation ecosystem actors on firm's innovation and new product development' (another model presented for the first time, designed by the author of the paper).

The results of the study can be helpful for economic policymakers. Therefore, they may use the results derived from the research to create better policies to improve the entrepreneurship and innovation climate so the innovation ecosystem performance may progress. The actors of the innovation ecosystem may also benefit from this study by adopting some of the concepts introduced in this research, like Collective Intelligence and Artificial Intelligence as future strategies, respectively tools of doing business in the Digital Era. Finally, this research will probably rise the enthusiasm and interest among other scholars to conduct further research in this very attractive field of study.

## 5.4. Limitations

Although the researcher through this study, as seen above, has attempted to make a significant scientific and practical contribution, the results derived carefully from statistical analysis are considered to be threatened by some possible limitations. Considering that the innovative ecosystems (IE) are not static configurations with predefined actors, which do not differ from each other, also considering that the focus of this study is on finding the correlation between the actors of the innovative ecosystem and their impact on the firm performance, the limitations of the study are outlined below. First, even though different scholars have emphasized a different number of Innovation Ecosystem (IE) actors, this study has researched seven of them (those which are predominantly active in the respected Innovation Ecosystem researched in this study). Secondly, the focus of the study was only on the ICT sector in Kosovo. Third, considering that there is no consensus about the performance measurement among the scholars (Al-Matari et al., 2014; Birchall et al., 2011; Murphy et al., 1996; Santos & Brito, 2012; Venkatraman & Grant, 1986), and taking into account that if several dimensions exist, a researcher should choose the dimensions most relevant to his or her research and judge the outcomes of this choice (Richard et al., 2009), there have been selected carefully financial and non-financial measurements. This study has used profitability, growth, efficiency, and firm introduction of new products as the dimensions of the overall firm innovation performance. Lastly, the study was based analysing subjective data collected directly by ICT companies' owners or representatives, instead of objective data sources like financial statements and other internal company records, so, the answers collected through survey may be not fully truthful. Even thought, the researcher has been very persuasive collecting the information as correct as possible.

## 5.5. Recommendations

The recommendations of this study are a derivative product of the research findings and conclusions of this study and the extensive literature review. Based on this logic, the there are some recommendation that can be offer to the respective interested stakeholders.

The ICT sector takes a considerable part in the employment rate and contributes to a significant share of the GDP of Kosovo. The Government of Kosovo officially declared the ICT industry a high priority sector for its economy (Government of Kosovo, Ministry of Economic Development, 2013, p.5). In addition, taking into account the statistical results of the current study deriving from the Dominance Analysis, ranking the Government as a very important Innovation Ecosystem Actor in the ICT Innovation Ecosystem of Kosovo, it is recommended that the Government of Kosovo should play a more proactive role within the Ecosystem, providing with a national strategy to promote the digital transformation and support Kosovo to become a knowledge-based economy through enhancing its international competitiveness based on digital excellence.

Kosovo is lacking to have an ICT drive ecosystem with a focus on unsealing value growth for different sectors from medicine, agriculture, tourism, and others. Each sector in the individual plan represents an industry relatively connected to the ICT ecosystem, but those connection are minimalistic and not efficiency purposive connections. It is recommended that the Government of Kosovo should create a master plan in collaboration with all respective Ministries, to give incentives the different industries of Kosovo's economy to co-evolve and cooperate with each other. These cooperation sectors in an ecosystem can be linked and expand to the international sphere by sharing best practices and fostering the

economic development of Kosovo. Collaborative ecosystems foster better align policy with stakeholders' needs, provide stronger channels of funds and, afford spaces for collaboration inside the ecosystem. The Cross-industry Cooperation Model of a Sustainable Innovation Ecosystem, proposed and designed for the first time by the author of the study should be used to achieve this goal.

The study results show that the cooperation with other start-ups and enterprises has been the dominant result among innovation ecosystem actors. It is recommended that the businesses of the Innovation Ecosystem, or the other planning to be part of this formation, to use an open-innovation pattern. This would mean that companies will take the advantage of exploring other actors of the ecosystem but will also be prepared to commercialize their innovations in cooperation with third-party actors who might be more befitted to put the innovations to market.

Based on this current study results, the Financial Institutions were ranked very poorly in the Dominance Analysis, meaning that they do not play a positive role toward helping the ICT businesses. Taking also into account that Kosovo has the second-highest lending interest rate in region, it is recommended that the Financial Institutions to be more active part of the innovation ecosystem with innovative financial products with favourable interest rates.

Taking into consideration the role that Innovation Ecosystem and the ICT Industry play in Kosovo’s economy, the candidate highly recommends other scholars to amplify their research interests into this very attractive and new field of study that is proved to be very helpful toward businesses operating in this era of globalization.

## 5.6. Future Research Directions

The aim of this study was to make a significant contribution to the Innovation Ecosystem literature. Nevertheless, it is understandable that no study may fill all the gaps in the respected field. Accordingly, the future research directions are proposed to urge exploring and researching in the innovation ecosystem field.

First, this study was performed in one country, in Kosovo, so the results may not be replicable to other countries. However, the generalization of results of this study and adoption to other countries may offer different results. Nevertheless, this study may pave the way to make comparisons with other countries and expand areas for further research.

Second, the results of the current research show that Financial Institutions, Culture and Social Norms, Non-government Organizations and Development Agencies, and Government do not have a significant impact on the overall firm innovation performance; consequently, there is a need to do further research to determine the cause of this non-significant relationship.

Third, comparable and complementary studies may be conducted into different industries to see if the dominance results of the impact of innovation ecosystem actors differ among industries.

Fourth, similar study may be conducted separately into four categories of business based on the number of employees in order to understand how the size of the company is related to the position of businesses within an innovation ecosystem.

Fifth, it will be very interesting if there would be used other statistical models to see if they will come with similar outcomes.

Finally, a Cross-industry Cooperation Model of a Sustainable Innovation Ecosystem should be researched among different national economies in order to find possibilities to propose cross-sectoral cooperation between different industries within national economies.

# REFERENCES


1. Acemouglu, D., Aghion, P. & Zilibotti, F. (2006).“Distance to Frontier, Selection and Economic Growth”, Journal of European Economic Association, pp. 37-74.

2. Adner, R. (2006). Match your innovation strategy to your innovation ecosystem, *Harvard Business Review*, Vol. 84, pp. 98–110

3. Adner, R. and Kapoor, R. (2010) ‘Value creation in innovation ecosystems: how the structure of technological interdependence affects firm performance in new technology generations’, *Strategic Management Journal*, Vol. 31, No. 3, pp.306–333.

4. Adner, R., and Feiler, D. (2017). Innovation Interdependence and Investment Choices: an Experimental Approach to Decision Making in Ecosystems

5. Ahmad, N.; Hoffman, A. (2008). A framework for addressing and measuring entrepreneurship. OECD Statistics Working Paper No. 2.

6. Akhtar, I. (2016). Research Design. *SSRN Electronic Journal*.

7. Al-Matari, E. M., Al-Swidi, A. K., & Fadzil, F. H. B. (2014). The Measurements of Firm Performance’s Dimensions. *Asian Journal of Finance & Accounting*, *6*(1), 24.

8. Almeida, P., & Kogut, B. (1999). Localization of knowledge and the mobility of engineers in regional networks. *Management science*, *45*(7), 905-917.

9. Allred, S. B., & Ross-Davis, A. (2011). The drop-off and pick-up method: An approach to reduce nonresponse bias in natural resource surveys. Small-Scale Forestry, 10(3), 305-318.

10. Anyadike-Danes, M., Hart, M. and Du, J. (2013) Firm Dynamics and Job Creation in the UK. University of Warwick Enterprise Research Centre White Paper.

11. Archibugi, D., & Iammarino, S. (2002). The globalization of technological innovation: definition and evidence. *Review of International Political Economy*, *9*(1), 98-122

12. Asheim , B T and Ikasen, A (2002) Regional innovation systems: the integration of local 'sticky' and global 'ubiquitous' knowledge, Journal of Technology Transfer, 27, 77-86

13. Asheim, B. T., & Gertler, M. S. (2005). The geography of innovation: regional innovation systems. In *The Oxford handbook of innovation*.

14. Audretsch, D. (1995). "Innovation and Industry Evolution", MIT Press, Cambridge, Ma,.

15. Audretsch, D. (1995). Innovation, growth and survival. International Journal of Industrial Organization, 13 (4), 441–457.

16. Baldwin, C. Y., & Woodard, C. J. (2009). The architecture of platforms: A unified view. *Platforms, markets and innovation*, *32*.

17. Baregheh, A., Rowley, J., & Sambrook, S. (2009). Towards a multidisciplinary definition of innovation. *Management Decision, 47,* 1323-1339.

18. Barlett, J.E. & Kotrlik, J. & Higgins, C.. (2001). Organizational Research: Determining Appropriate Sample Size in Survey Research. Information Technology, Learning, and Performance Journal. 19.

19. Basole, R. C. (2009). Visualization of interfirm relations in a converging mobile ecosystem. *Journal of information Technology*, *24*(2), 144-159.

20. Basole, R.C. and Rouse, W.B. (2008) Complexity of Service Value Networks: Conceptualization and Empirical Investigation. IBM Systems Journal, 47, 53-68.

21. Batterton, K. A., & Hale, K. N. (2017). The Likert scale what it is and how to use it. *Phalanx*, *50*(2), 32-39.

22. Benesty, J., Chen, J., Huang, Y., & Cohen, I. (2009). Pearson correlation coefficient. In *Noise reduction in speech processing* (pp. 1-4). Springer, Berlin, Heidelberg.

23. Birch, D., "The Job Generation Process, Final Report to Economic Development Administration, Cambridge", MA: MIT Program on Neighbourhood and Regional Change, 1979.

24. Birchall, D., Chanaron, J. J., Tovstiga, G., & Hillenbrand, C. (2011). Innovation performance measurement: current practices, issues and management challenges. *International Journal of Technology Management*, *56*(1), 1.

25. Bland, J. M., & Altman, D. G. (1997). Statistics notes: Cronbach's alpha. *Bmj*, *314*(7080), 572.

26. Boer, H., & During, W. E. (2001). Innovation, what innovation? A comparison between product, process and organisational innovation. *International Journal of Technology Management*, *22*(1-3), 83-107

27. Boone, H. N., & Boone, D. A. (2012). Analyzing likert data. *Journal of extension*, *50*(2), 1-5.

28. Borgh, M., Cloodt, M., & Romme, A. G. (2012). Value creation by knowledge-based ecosystems: Evidence from a field study. *R&D Management, 42*(2), 150-169.

29. Braunerhjelm, P. (2010). Entrepreneurship, Innovation and Economic Growth-past experience, current knowledge and policy implications.

30. Bryman, A. (2006). Integrating quantitative and qualitative research: how is it done?. Qualitative research, 6(1), 97-113.

31. Bryman, A., & Bell, E. (2012). *Business research methods*. Oxford University Press, USA.

32. Bryman, A., & Bell, E. (2015). Business research methods. Oxford University Press, USA

33. Bryman, A., Bell, E., & Harley, B. (2018). *Business research methods* (5th ed.). Oxford: Oxford Univ. Press.

34. Carayannis E.G., Campbell D.F.J. (2012) Mode 3 Knowledge Production in Quadruple Helix Innovation Systems. In: Mode 3 Knowledge Production in Quadruple Helix Innovation Systems. SpringerBriefs in Business, vol 7. Springer, New York, NY.

35. Carayannis, E. G. (2013). *Encyclopedia of creativity, invention, innovation and entrepreneurship* (pp. 36-47). Springer Science+ Business Media BV, Formerly Kluwer Academic Publishers BV.

36. Carayannis, E. G., & Campbell, D. F. (2009). 'Mode 3'and'Quadruple Helix': toward a 21st century fractal innovation ecosystem. *International journal of technology management*, *46*(3-4), 201-234.

37. Carayannis, E. G., & Campbell, D. F. (2010). Triple Helix, Quadruple Helix and Quintuple Helix and how do knowledge, innovation and the environment relate to each other?: a proposed framework for a trans-disciplinary analysis of sustainable development and social ecology. *International Journal of Social Ecology and Sustainable Development (IJSESD)*, *1*(1), 41-69.

38. Carlson C.C., & Wilmot, W.W. (2006). *Innovation: The five disciplines for creating what customers want.* New York: Crown Business.

39. Chen, J., Yin, X., & Mei, L. (2018). Holistic innovation: An emerging innovation paradigm. *International Journal of Innovation Studies*, *2*(1), 1-13.

40. Chesbrough, H. W. (2011). *Open innovation: The new imperative for creating and profiting from technology*. Boston, MA: Harvard Business School Press.

41. Chesbrough, H., & Crowther, A. K. (2006). Beyond high tech: early adopters of open innovation in other industries. *R&d Management*, *36*(3), 229-236.

42. Clarysse, B., Wright, M., Bruneel, J., & Mahajan, A. (2014). Creating value in ecosystems: Crossing the chasm between knowledge and business ecosystems. *Research Policy, 43*(7), 1164-1176.

43. Cohen, B. (2006). Sustainable valley entrepreneurial ecosystems. Business Strategy Environment, 15, 1–14.

44. Cohen, J. (1988). Statistical power analysis for the behavioral sciences New York. *NY: Academic*, 54.

45. Cohen, J. (1992). A power primer. *Psychological bulletin*, *112*(1), 155.

46. Cohen, J. L., & Kharas, H. (2018). Using big data and artificial intelligence to accelerate global development. *Brookings Institution Accessed*, *4*, 19.

47. Cooke P. Uranga, M. and Etebarria G. (1997) Regional Innovation systems: Institutional and Organisational dimensions, Research Policy, 26, 475-491.

48. Cooke, P (2001) Regional Innovation Systems, Clusters, and the Knowledge Economy, Industry and Corporate Change, 10, 945-974

49. Cortright, J., & Mayer, H. (2002). Signs of life: The growth of biotechnology centers in the US.

50. Corrente, S., Greco, S., Nicotra, M., Romano, M., & Schillaci, C. E. (2018). Evaluating and comparing entrepreneurial ecosystems using SMAA and SMAA-S. *The Journal of Technology Transfer, 44*(2), 485-519.

51. Coughlan, T. (2014). Enhancing innovation through virtual proximity. *Technology Innovation Management Review*, *4*(2).

52. Crawford, S. L. (2006). Correlation and regression. Circulation, 114(19), 2083-2088.

53. Creswell, J. W. (2013). Research design: Qualitative, quantitative, and mixed methods approaches. Sage publications.

54. Creswell, J.W. (2005) Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research, Merrill

55. Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. Psychometrika. 16, 297-334.

56. Crowther, D., & Lancaster, G. (2008). *Research methods: a concise introduction to research in management and business consultancy*. Oxford: Butterworth-Heinemann, p 23.

57. Cunningham, J., & O'Kane, C (2017). Technology based nascent entrepreneurship. London: Palgrave Macmillan.

58. Czaja, R. (1998). Questionnaire pretesting comes of age. *Marketing Bulletin-Department of Marketing Massey University, 9,* 52-66.

59. Della Croce, R., Stewart, F., & Yermo, J. (2011). Promoting longer-term investment by institutional investors: selected issues and policies. *OECD Journal: Financial Market Trends*, *2011*(1), 145-164.

60. DeVellis, R. F. (2016). *Scale development: Theory and applications* (Vol. 26). Sage publications.

61. Dodgson, M., Gann, D. and Salter, A. (2006). The role of technology in the shift towards open innovation: the case of Procter & Gamble. R&D Management, 36: 333-346.

62. Dornyei, Z. (2007). Research Methods in Applied Linguistics: Quantitative, Qualitative and Mixed Methodologies. Oxford University Press. Oxford

63. Dörnyei, Zoltan & Griffee, Dale. (2010). Research Methods in Applied Linguistics. TESOL Journal. 1. 10.5054/tj.2010.215611.

64. Drucker FP. (1993). Innovation and Entrepreneurship. Harper & Row Publishers Inc.: New York, NY

65. Drucker, P. F. (1998). The Discipline of Innovation. Harvard Business Review, November- December.

66. Durst, S.; Poutanen, P. (2013). Success factors of innovation ecosystems: a literature review. In R. Smeds & O. Irrmann (eds.) CO-CREATE 2013: The Boundary-Crossing Conference on Co-Design in Innovation, 27-38.

67. Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., ... & Galanos, V. (2019). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, 101994.

68. Elia, G., Margherita, A., & Passiante, G. (2020). Digital entrepreneurship ecosystem: How digital technologies and collective intelligence are reshaping the entrepreneurial process. *Technological Forecasting and Social Change*, *150*, 119791.

69. Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: from National Systems and "Mode 2" to a Triple Helix of university–industry–government relations. *Research policy*, *29*(2), 109-123.

70. European Commission (2018). *European Commission COM (2018) 435 Final: Proposal Establishing Horizon Europe—the Framework Programme for Research and Innovation, Laying Down Its Rules for Participation and Dissemination*; European Commission: Brussels, Belgium; Volume 0224, p. 57.

71. European Commission. (2014). Instrument for Pre-Accession Assistance (IPA II) 2014–2020. EU Support for the Competitiveness of Kosovo's ICT Sector.

72. Fagerberg, J. (2004). Innovation: A guide to the literature. Georgia Institute of Technology.

73. Feldman, M. P. (2001). The entrepreneurial event revisited: firm formation in a regional context. *Industrial and corporate change*, *10*(4), 861-891.

74. Felländer, A., Ingram, C., & Teigland, R. (2015). Sharing economy. In *Embracing Change with Caution. Näringspolitiskt Forum Rapport* (No. 11).

75. Fenwick, M., Vermeulen, E. P., & Corrales, M. (2018). Business and regulatory responses to artificial intelligence: dynamic regulation, innovation ecosystems and the strategic management of disruptive technology. In *Robotics, AI and the Future of Law* (pp. 81-103). Springer, Singapore.

76. Fox, N. J., & Alldred, P. (2015). New materialist social inquiry: designs, methods and research- assemblage. *International Jpurnal of Social Research Methodology, 18(4), 399-414.*

77. Fritsch, M. (2013). New business formation and regional development—A survey and assessment of the evidence. Foundations and Trends in Entrepreneurship, 9, 249–364.

78. Frosch, R., & Gallopoulos, N. (1989). Strategies for Manufacturing. *Scientific American, 261*(3), 144-153

79. Galateanu, E.; Avasilcai, S. (2013). Business ecosystems architecture. Annals of the Oradea university, 79-84

80. Gertler, M. (2003) Tacit Knowledge and the economic geography of context, or The indefinable tacitness of being (there), Journal of Economic Geography, 3, 75-99.

81. Gibbons, M. and Limoges, C., Nowotny, H., Schwartzman, S., Scott, P. and Trow, M. (1994). *The New Production of Knowledge, The Dynamics of Science and Research in Contemporary Societies*, Sage, London.

82. Gill, J., & Johnson, P. (1997). *Research methods for managers: 2nd ed*. London: Paul Chapman Publishing.pp.32.

83. Given Lisa M. (2008). Convenience Sample. In The SAGE Encyclopaedia of Qualitative Research Methods. Thousand Oaks, CA: Sage

84. Glaser, B. G., & Strauss, A. L. (2017). *Discovery of grounded theory: Strategies for qualitative research.* New York. Routledge.

85. Gliem, J. A., & Gliem, R. R. (2003). Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales. Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education.

86. González Fernández, S., Kubus, R., & Mascareñas Pérez-Iñigo, J. (2019). Innovation Ecosystems in the EU: Policy Evolution and Horizon Europe Proposal Case Study (the Actors' Perspective). *Sustainability*, *11*(17), 4735.

*87.* Government of Kosovo, Ministry of Economic Development. (2013). *Electronic Communication Sector Policy – Digital Agenda for Kosova 2013-2020.*

88. Government of Kosovo, Ministry of Economic Development. (2016). *Kosovo IT Strategy*.

89. Gow, Ian Drummond & Kells, Stuart S & Melbourne Institute of Applied Economic and Social Research (1998). *The theory and measurement of profitability*. Melbourne Institute of Applied Economic and Social Research, Parkville, Vic

90. Granstrand, O., & Holgersson, M. (2020). Innovation ecosystems: A conceptual review and a new definition. *Technovation*, *90-91*, 102098. doi: 10.1016/j.technovation.2019.102098

91. Gray, D. E. (2013). *Doing research in the real world.* London. Sage Publications.

92. Green, S. B. (1991). How many subjects does it take to do a regression analysis. Multivariate behavioral research, 26(3), 499-510.

93. Grossman, G. M., & Helpman, E. (1994). Endogenous innovation in the theory of growth. *Journal of Economic Perspectives*, *8*(1), 23-44.

94. Guerrero, M., Urbano, D., Fayolle, A., Klofsten, M., & Mian, S. (2016). Entrepreneurial universities: Emerging models in the new social and economic landscape. *Small Business Economics, 47*(3), 551-563.

95. Gulati, R., Puranam, P. and Tushman, M. (2012), Meta-organization design: Rethinking design in interorganizational and community contexts. Strat. Mgmt. J., 33: 571-586

96. Hertzog, M. A. (2008). Considerations in determining sample size for pilot studies. *Research in nursing & health*, *31*(2), 180-191.

97. Herrera, F., Guerrero, M., & Urbano, D. (2018). Entrepreneurship and innovation ecosystem's drivers: The role of higher education organizations. In *Entrepreneurial, innovative and sustainable ecosystems* (pp. 109-128). Springer, Cham.

98. Hill, R. (1998). What sample size is "enough" in internet survey research. *Interpersonal Computing and Technology: An electronic journal for the 21st century*, *6*(3-4), 1-10.

99. Howells, J and Edler, J., (2011). Structural innovations: towards a unified perspective. Science and Public policy. 38(2) March 2011. Pages 157-167.

100. Hughes, M., Ireland, R. D., & Morgan, R. E. 2007. 'Stimulating dynamic value: Social capital and business incubation as a pathway to competitive success.' Long Range Planning, 40(2).

101. Hwang, V. W., & Horowitt, G. (2012). The rainforest: The secret to building the next Silicon Valley.

102. Iansiti, M., & Levien, R. (2004). *The keystone advantage: what the new dynamics of business ecosystems mean for strategy, innovation, and sustainability*. Boston, MA: Harvard Business School Press, pp.51.

103. Iansiti, M., & Levien. R. (2004). Strategy as ecology. Harvard Business Review, 82 (3), pp. 68-78

104. Isaac, S. & Michael, W.B., 1970. Handbook in Research and Evaluation. Available at: http://eric.ed.gov/?id=ED051311 [Accessed May 7, 2016].

105. Isenberg, D. (2010). How to start an entrepreneurial revolution. Harvard Business Review.

106. Isherwood, D.; Coetzee, M. (2011). Enhancing digital business ecosystem trust and reputation with centrality measures. Information Security South Africa (ISSA), 1-8

107. Jackson, D.J., (2011). What is an innovation ecosystem. National Science Foundation,

108. Jackson, S. L. (2015). Research methods and statistics: A critical thinking approach. Cengage Learning.

109. James F. Moore. (1993). Predators and prey: a new ecology of competition. Harvard Business Review, 71 (3), pp. 75-86

110. Klepper, S. (2009). Spinoffs: A review and synthesis. European Management Review, 6, 159–171.

111. Komninos, N. (2006). The architecture of intelligent cities. *Intelligent Environments*, *6*, 53-61.

112. Korhonen, J. (2001). Four ecosystem principles for an industrial ecosystem. *Journal of Cleaner Production*, *9*(3), 253–259.

*113.* Kosovo Agency of Statistics –KAS. (2020). *Statistical Yearbook of the Republic of Kosovo, 2020.*

*114.* Kosovo Agency of Statistics-KAS. (2019). *Labour Force Survey.*

115. Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Age International.

116. Leon, G. (2013). Analysis of university-driven open innovation ecosystems: the UPM case study.

117. Lévy, P., & Bononno, R. (1997). *Collective intelligence: Mankind's emerging world in cyberspace*. Perseus books.

118. Leydesdorff, L. (2012). The triple helix, quadruple helix,…, and an N-tuple of helices: explanatory models for analyzing the knowledge-based economy?. *Journal of the Knowledge Economy*, *3*(1), 25-35.

119. Liu, Z., & Stephens, V. (2019). Exploring innovation ecosystem from the perspective of sustainability: Towards a conceptual framework. *Journal of Open Innovation: Technology, Market, and Complexity*, *5*(3), 48.

120. Lorz, M., Mueller, S., & Volery, T. (2013). Entrepreneurship Education: A Systematic Review Of The Methods In Impact Studies. *Journal of Enterprising Culture, 21*(02), 123-151.

121. Lusch, R. F., Vargo, S. L., & Tanniru, M. (2010). Service, value networks and learning. *Journal of the academy of marketing science*, *38*(1), 19-31.

122. Malone, T. W., & Bernstein, M. S. (Eds.). (2015). *Handbook of collective intelligence*. MIT Press.

123. Malone, T. W., Laubacher, R., & Dellarocas, C. (2009). Harnessing crowds: Mapping the genome of collective intelligence.

124. Marczyk, G., DeMatteo, D., & Festinger, D. (2005). *Essentials of behavioral science series. Essentials of research design and methodology.* Hoboken, NJ, US: John Wiley & Sons Inc.

125. MaryAnne M. Gobble. (2014). Charting the innovation ecosystem. Res. Technol. Manag., 57 (4), pp.55-57

126. Mason, Colin, Brown, Ross, (2014). Entrepreneurial ecosystems and growth oriented entrepreneurship. Final Report to OECD, Paris 30 (1), 77–102.

127. Mcdade, B. E., & Malecki, E. J. (1997). Entrepreneurial Networking: Industrial Estates In Ghana. *Tijdschrift Voor Economische En Sociale Geografie, 88*(3), 262-272.

128. Mcintyre, D. P., & Srinivasan, A. (2016). Networks, platforms, and strategy: Emerging views and next steps. *Strategic Management Journal, 38*(1), 141-160.

129. McKinley, W., Latham, S., & Braun, M. (2014). Organizational decline and innovation: Turnarounds and downward spirals. *Academy of Management Review, 39,* 88-110.

130. Mercan, B. & Göktaş, D. (2011). Components of Innovation Ecosystems: A Cross-Country Study, *International Research Journal of Finance and Economics*, Iss. 76, pp. 102–112.

131. Miaoulis, George, and R. D. Michener. (1976). An Introduction to Sampling. Dubuque, Iowa: Kendall/Hunt Publishing Company.

132. Miller, P and Bound, K (2011) The Start-Up Factory: the rise of accelerator programmes to support new technology ventures, NESTA, Discussion Paper

133. Miller, R. Brewer, J. (2003) The A-Z of social research. London: Sage publications.

134. Ministry of Trade and Industry – MTI. (2017). Analytical Report on Trade in Services – ICT Sector

135. Moore, J.F. (1996). The death of competition: leadership & strategy in the age of business ecosystems. New York, Harper Business

136. Mowery, D. and Rosenberg, N. (1979): The Influence of Market Demand upon Innovation: a CriticalReview of Some Recent Empirical Studies, Research Policy,8: 102-153

137. Mulgan, G. (2018). *Big mind: How collective intelligence can change our world*. Princeton University Press.

138. Murati-Leka, H. (2018). The absorptive capacity of knowledge and new technologies in companies from Kosovo. *Knowledge International Journal*, *28*(1), 49 - 54.

139. Murphy, G. B., Trailer, J. W., & Hill, R. C. (1996). Measuring performance in entrepreneurship research. Journal of business research, 36(1), 15-23.

140. Myers, R. (1990). The Multiple Linear Regression Model. In *Classical and Modern Regression with Applications* (2nd ed., pp. 82–163). Duxburg Thomson Learning.

141. Nachira, F. (2002). Towards a network of digital business ecosystems fostering the local development. European Commission Discussion Paper, Bruxelles.

142. Nadiri, I. (1993). *Innovations and technological spillovers' NBER Working Paper*, No. 4423. Cambridge, Massachussets.

143. Neck, H. M., Meyer, G. D., Cohen, B., & Corbett, A. C. (2004). An entrepreneurial system view of new venture creation. Journal of Small Business Management, 42, 190–208.

144. Newman, I. (n.d.). A Conceptualization of Mixed Methods: A Need for Inductive / Deductive Approach to Conducting Research. Retrieved 2000, from https://files.eric.ed.gov/fulltext/ED443849.pdf

145. Norton, R D (2001) Creating the New Economy: The Entrepreneur and the U. S. Resurgence, Edward Elgar: Cheltenham.

146. Nunnally, B., & Bernstein, I. R. (1994). Psychometric Theory. New York: Oxford Univer.

147. O'Sullivan, D., & Dooley, L. (2009). *Applying innovation.* Thousand Oakes, CA: SAGE Publications.

148. OECD (2013). Private Sector Development. Assessment of the Kosovo Innovation System

149. Oksanen, K., & Hautamaki, A. (2015). Sustainable Innovation: A Competitive Advantage for Innovation Ecosystems. *Technology Innovation Management Review,* 5(10): 24-30.

150. Peltoniemi, M. (2005). Business ecosystem. A conceptual model of an organisation population from the perspectives of complexity and evolution. E-Business Research Center. Research Reports 18 Tampere. ISSN 1459-0166

151. Peltoniemi, M.; Vuori, E. (2004). Business ecosystem as the new approach to complex adaptive business environments. Proceedings of eBusiness Research Forum, Tampere.

152. Pellikka, J., & Ali-Vehmas, T. (2016). Managing Innovation Ecosystems to Create and Capture Value in ICT Industries. *Technology Innovation Management Review,* 6(10): 17-24.

153. Perry, Chad. (1995) A Structured Approach to Presenting PhD Theses: Notes for Candidates and their Supervisors. Paper presented at the ANZ Doctoral Consortium, University of Sydney.

154. Phillips, E., Pugh, D. S., & Johnson, C. (2015). *How to get a PhD: A handbook for students and their supervisors*. Maidenhead: Open University Press.

155. Pilinkienė, V., & Mačiulis, P. (2014). Comparison of Different Ecosystem Analogies: The Main Economic Determinants and Levels of Impact. *Procedia - Social and Behavioral Sciences*, *156*, 365–370.

156. Plant, R. (2011). An introduction to artificial intelligence. In *32nd Aerospace Sciences Meeting and Exhibit* (p. 294).

157. Porter ME. (1985). *Competitive Advantage: Creating and Sustaining Superior Performance*. Free Press: New York pp.35-39.

158. Porter, M. (1998). Clusters and the new economics of competition. Harvard Business Review, November– December, 77–89

159. Porter, M. E. (2000). "Location, Clusters, and Company Strategy." In *Oxford Handbook of Economic Geography*, edited by G. Clark, M. Feldman, and M. Gertler. Oxford: Oxford University Press.

160. Porter, M.E., & Stern, S. (1999). *The new challenge to America's prosperity: Findings from the innovation index.* Washington, DC: Council on Competitiveness.

161. Pullen, A., De Weerd-Nederhof, P., Groen, A., Song, M., & Fisscher, O. (2009). Successful patterns of internal SME characteristics leading to high overall innovation performance. *Creativity and Innovation Management*, *18*(3), 209-223.

162. Rafael Amit, Christoph Zott. (2001). Value Creation in e-Business. Strategic Management Journal, volume 22, p. 493 – 520.

163. Ramadani, V., & Gerguri, S. (2011). Innovations: principles and strategies. *Strategic Change*, *20*(3-4), 101-110.

164. Ratner, B. (2009). The correlation coefficient: Its values range between +1/-1, or do they?. *J. Target Meas Anal Mark 17,* 139-142.

165. Rexhepi, G., & Srhoj, S. (2018). Strategy as an ever evolving road to success of growing enterprises. World Review of Entrepreneurship, Management and Sustainable Development, 14(3), 333–347.

166. Rexhepi, G., Hisrich, R. D., & Ramadani, V. (2019). Open Innovation and Entrepreneurship: An Overview. In *Open Innovation and Entrepreneurship* (pp. 1-7). Springer, Cham.

167. Rexhepi, G., Kurtishi, S., & Bexheti, G. (2013). Corporate social responsibility (CSR) and innovation–the drivers of business growth? Procedia-Social and Behavioral Sciences, 75, 532–541.

168. Richard, P. J., Devinney, T. M., Yip, G. S., & Johnson, G. (2009). Measuring Organizational Performance: Towards Methodological Best Practice. *Journal of Management*, *35*(3), 718–804.

169. Richardson, L. (2015). Performing the sharing economy. *Geoforum*, *67*, 121-129.

170. Richter, A., Music, A., & Račić, D. (2013). Assessment of the Kosovo* Innovation System.

171. Rogers, M. (1998). *The Definition and Measurement of Innovation.* Melbourne Institute Working Paper No.10/98.

172. Ron Adner, Joanne E. Oxley, Brian S. Silverman (Eds.), (2013). Collaboration and Competition in business Ecosystem, Emerald Group Publishing Limited, pp. 167-194.

173. Roper, S and Hart, M (2013) Supporting Sustained Growth Among SMEs – Policy Models and Guidelines University of Warwick, Enterprise Research Centre, White Paper No.7

174. Rothaermel, F.T. (2013). *Strategic management: Concepts & cases.* New York, NY: McGraw-Hill/Irwin.

175. Rothschild, M. (1990). Bionomics: economy as ecosystem. New York, Henry Holt and Company

176. Sanfey, P., Milatovic, J., & Kresic, A. (2016). How the Western Balkans can catch up.

177. Santos, J. B., & Brito, L. A. (2012). Toward a subjective measurement model for firm performance. *BAR - Brazilian Administration Review, 9*(Spe), 95-117.

178. Santos, J. R. A. (1999). Cronbach's alpha: A tool for assessing the reliability of scales. *Journal of extension, 37(2),* 1-5.

179. Santos, Juliana Bonomi, & Brito, Luiz Artur Ledur. (2012). Toward a subjective measurement model for firm performance. *BAR - Brazilian Administration Review*, *9*(spe), 95-117.

180. Saunders, M., Lewis, P. and Thornhill, A. (2003) Research Methods for Business Students in, 3rd edition, Harlow: Pearson Education

181. Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students*. Harlow: Pearson Education.

182. Schor, J. (2016). Debating the sharing economy. *Journal of Self-Governance and Management Economics*, *4*(3), 7-22.

183. Schumpeter, J. A. (1939). *Business cycles* (Vol. 1, pp. 161-174). New York: McGraw-Hill.

184. Schumpeter, J. A. (1942). Capitalism Socialism and Democracy, Harper Collins Publishers, New York

185. Sekaran, U & Bougie, R. (2016). *Research Methods For Business: a skill building ap proach 7e with wileyplus learning space card set*. Place of publication not identified: JOHN WILEY & Sons, 82-392.

186. Sekaran, U. (2003). Research method for business (4th ed.). New York: John Wiley and sons, inc

187. Siegel, D. S., Westhead, P., & Wright, M. (2003). Science parks and the performance of new technology-based firms: A review of recent UK evidence and an agenda for future research. Small Business Economics, 20(2), 177–184.

188. Singh, K. (2007). *Quantitative social research methods*. Los Angeles Sage Publications.

189. Smiciklas, M. (2012). *The power of infographics: Using pictures to communicate and connect with your audiences*. Que Publishing.

190. Soiferman, L. K. (2010). Compare and Contrast Inductive and Deductive Research Approaches. *Online Submission*.

191. Solow, R. M. (1956). A contribution to the theory of economic growth. *The quarterly journal of economics*, *70*(1), 65-94.

192. Spigel, B. (2017). The relational organization of entrepreneurial ecosystems. Entrepreneurship Theory and Practice, 41(1), 49–72.

193. Steele, J., Bourke, L., Luloff, A. E., Liao, P. S., Theodori, G. L., & Krannich, R. S. (2001). The drop-off/pick-up method for household survey research. Community Development, 32(2), 238-250.

194. Stephan, F. F. (1948). History of the Uses of Modern Sampling Procedures. *Journal of the American Statistical Association, 43*(241), 12-39.

195. STIKK / INDEXKOSOVA (2013): ICT market analysis and skills gap analysis Kosovo.

196. STIKK. (2018), *Kosovo IT Barometer, Final Report.*

197. Still, K.; Huhtamäki, J.; Russell, M. G.; Rubens, N. (2014). Insights for orchestrating innovation ecosystems: the case of EIT ICT Labs and data-driven network visualisations. International Journal of Technology Management vol. 66, num. 2/3, 243-265.

198. Storper, M and Venables, A (2004) Buzz: face-to-face contact and the urban economy, Journal of Economic Geography, 4 (4), 351-370

199. Striteska, M. K., & Prokop, V. (2020). Dynamic Innovation Strategy Model in Practice of Innovation Leaders and Followers in CEE Countries—A Prerequisite for Building Innovative Ecosystems. *Sustainability, 12*(9), 3918.

200. Suen, L. J. W., Huang, H. M., & Lee, H. H. (2014). A comparison of convenience sampling and purposive sampling. Hu Li Za Zhi, 61(3), 105.

201. Shane, S. (2009) Why encouraging more people to become entrepreneurs is bad public policy, Small Business Economics, 33, 141-149.

202. Talmar, M., Walrave, B., Podoynitsyna, K. S., Holmström, J., & Romme, A. G. L. (2018). Mapping, analyzing and designing innovation ecosystems: The Ecosystem Pie Model. *Long Range Planning*, 101850.

203. Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education*, *2*, 53.

204. Teece DJ. (1986). Profiting from technological innovation: implications for integration, collaboration, licensing and public policy. *Research Policy* **15**(6): 285–305.

205. Teece, D. (2007). Explicating Dynamic Capabilities: The Nature and Microfoundations of (Sustainable) Enterprise Performance. *Strategic Management Journal, 28*(13), 1319-1350.

206. Tiwana, A., Konsynski, B., & Bush, A. A. (2010). Research Commentary—Platform Evolution: Coevolution of Platform Architecture, Governance, and Environmental Dynamics. *Information Systems Research, 21*(4), 675-687.

207. Torre, A. (2008). On the role played by temporary geographical proximity in knowledge transmission. *Regional studies*, *42*(6), 869-889.

208. Torre, A. (2013). Proximity relationships and entrepreneurship. *Encyclopedia of Creativity, Invention, Innovation and Entrepreneurship. New York: Springer*, 1503-1509.

209. Thomas, D. R. (2006). A General Inductive Approach for Analyzing Qualitative Evaluation Data. *American Journal of Evaluation*, *27*(2), 237–246.

210. Thomas, L. and Autio, E., (2019). Innovation Ecosystems. Available at SSRN: https://ssrn.com/abstract=3476925 or http://dx.doi.org/10.2139/ssrn.3476925

211. Utterback, J. M. (1971). The process of innovation: A study of the origination and development of ideas for new scientific instruments. *IEEE transactions on Engineering Management*, (4), 124-131.

212. V.W. Hwang, G. Horowitt. (2012). The Rainforest: The Secret to Building the Next Silicon Valley, Regenwald, Los Altos Hills, CA,USA.

213. Valkokari, K. (2015). Business, Innovation, and Knowledge Ecosystems: How They Differ and How to Survive and Thrive within Them. *Technology Innovation Management Review*, 5(8): 17–24.

214. VanVoorhis, C. W., & Morgan, B. L. (2007). Understanding power and rules of thumb for determining sample sizes. *Tutorials in Quantitative Methods for Psychology, 3(2),* 43-50.

215. Venkatraman, N., & Grant, J. H. (1986). Construct measurement in organizational strategy research: A critique and proposal. *The Academy of Management Review, 11*(1), 71–87.

216. Viitanen, J. (2016). Profiling Regional Innovation Ecosystems as Functional Collaborative Systems: The Case of Cambridge. *Technology Innovation Management Review,* 6(12): 6-25.

217. Von Hippel, E. (2006). *Democratizing innovation* (p. 216). the MIT Press.

218. Vorley, T., & Williams, N. (2017). Fostering entrepreneurship and economic growth: Pathways to economic resilience in Kosovo. *World Review of Entrepreneurship, Management and Sustainable Development*, *13*(2-3), 159-177.

219. Walliman, N. (2011). Your research project: Designing and planning your work. UK. Sage Publications.

220. Walliman, N. (2011). Your research project: Designing and planning your work. UK. Sage Publications.

221. Wallner, T., & Menrad, M. (2011). Extending the Innovation Ecosystem Framework. In Proceedings of XXII ISPIM Conference. Hamburg, Germany.

222. Weber, M. L., & Hine, M. (2015). Who inhabits a business ecosystem? The technospecies as a unifying concept. *Technology Innovation Management Review*, *5*(5), 31-44.

223. Wessner, C. W. (2007). Innovation policies for the 21st century. Report of a symposium. Washington, D.C: The National Academies Press.

224. Williams, C. C., & Krasniqi, B. (2018). Explaining informal sector entrepreneurship in Kosovo: An institutionalist perspective. *Journal of Developmental Entrepreneurship*, *23*(02), 1850011.

225. Williams, C., Bejaković, P., Mikulić, D., Franic, J., Kedir, A., & Horodnic, I. A. (2017). An evaluation of the scale of undeclared work in the European Union and its structural determinants: estimates using the Labour Input Method. *An Evaluation of the Scale of Undeclared Work in the European Union and Its Structural Determinants: Estimates Using the Labour Input Method, Publications Office of the European Union, Luxembourg*.

226. World Bank Group (2020). Doing Business. Economy Profile, Kosovo. Retrieved 2020, from https://www.doingbusiness.org/content/dam/doingBusiness/country/k/kosovo/KSV.pdf

227. World Bank Indicators (2017). International Monetary Fund, Balance of Payments Statistics Yearbook and data files. *ICT service exports (% of service exports, BoP) – Kosovo 2007-2017.*

228. World Bank Indicators (2019). International Monetary Fund. *Lending interest rate (%) (FR.INR.LEND),2009-2019,XKK,ALB,SRB,BIH,MKD.*[onlineversion] https://data.worldbank.org/indicator/FR.INR.LEND?end=2019&locations=XK-AL-RS-BA-MK&start=2009&view=chart

229. Yawson, R.M. (2009). The ecological system of innovation: a new architectural framework for a functional evidence-based platform for science and innovation Policy. XXIV ISPIM 2009 Conference: The Future of Innovation, Vienna, Austria, 1–16

230. Albors-Garrigos, J., & Barrera, R. R. (2011). Impact of public funding on a firm's innovation performance: Analysis of internal and external moderating factors. *International Journal of innovation management*, *15*(06), 1297-1322.

# APPENDICIES

**Appendix 1: QUESTIONNAIRE**

**Demographic Variables as control variables**

**1. Name of the company**

_____

**2. Company's headquarter location**

_____

**3. Number of employees**

_____

**4. Job position at the company**

_____

| Innovation Ecosystem Variables | Description | Type of Variable | No. of items | Scale item | Scale | Reference |
|---|---|---|---|---|---|---|
| **RD** | R&D that firm has contracted out to other firms (including other firms in their group) or to the public or private research organizations and universities | Independent | 2 | • The collaboration with private and public research organizations and universities has helped our company to develop new products and services.<br>• The collaboration with private and public research organizations and universities has improved the financial status of our company. | Likert scale (from strongly disagree to strongly agree). | Striteska & Prokop (2020) |
| **GOV** | "Government Programs" concern the presence and quality of programs directly assisting SMEs at all levels of government (national, regional, municipal). | Independent | 2 | • The government programs available in our country has helped our company to develop new products and services.<br>• The government programs available in our country has improved the financial status of our company. | Likert scale (from strongly disagree to strongly agree). | Corrente el al. (2008) |

| | | | | | | |
|---|---|---|---|---|---|---|
| **FIN** | "Entrepreneurial Finance" represents the availability of financial resources for small and medium enterprises (SMEs). | Independent | 2 | • The banking system and other financial sources has been very helpful toward our company to develop new products and services.<br>• The banking system and other financial sources have been very helpful to improve the financial status of our company. | Likert scale (from strongly disagree to strongly agree). | Corrente el al. (2008) |
| **CO** | Cooperation on any innovation activities with other firms or institutions. | Independent | 2 | • The cooperation on innovation activities with other companies has helped our company to develop new products and services.<br>• The cooperation on innovation activities with other companies has improved the financial status of our company. | Likert scale (from strongly disagree to strongly agree). | Striteska & Prokop (2020) |

| | | | | | | |
|---|---|---|---|---|---|---|
| **NGO** | Non-government organization projects to help start-ups and other enterprises of the innovation ecosystem | Independent | 2 | • Participation on NGOs projects has helped our company to develop new products and services.<br>• Participation on NGOs projects has improved the financial status of our company. | Likert scale (from strongly disagree to strongly agree). | Researcher |
| **INC& AC** | The cooperation with Incubators and Accelerators | Independent | 2 | • The cooperation with Incubators and Accelerators has helped our company to develop new products and services.<br>• The cooperation with Incubators and Accelerators has improved the financial status of our company. | Likert scale (from strongly disagree to strongly agree). | Researcher |
| **CUL** | "Cultural and Social Norms" | Independent | 2 | • Culture and Social Norms has encourage our company to | Likert scale (from | Corrente el al. (2008) |

| | | | | | | |
|---|---|---|---|---|---|---|
| | represents the extent to which social and cultural norms encourage or allow actions leading to new business methods or activities that can potentially increase personal wealth and income. | | | develop new products and services.<br>• Culture and Social Norms has helped the improvement of the financial status of our company. | strongly disagree to strongly agree). | |
| **Performance Variables** | **Description** | **Type of Variable** | **No. of items** | **Scale item** | **Scale** | **Reference** |
| **INIP** | Introduction of a new or significantly improved product or service. | Dependent | 1 | • During the last three years my company has introduced new products and services in the market | Likert scale (from strongly disagree to strongly agree). | Rogers (1998); Striteska & Prokop (2020); Researcher |
| **PRF** | Profitability: The account-based measurement: Return on Assets, EBTIDA margin, Return on investment, Net | Dependent | 3 | • My company is normally satisfied with Net Income / Revenues<br>• My company is normally satisfied | Likert scale (from strongly disagree to strongly agree). | Santos & Brito (2012); Gow et al. (1998) |

| | | | | | | |
|---|---|---|---|---|---|---|
| | income/ Revenues, Return on equity, Economic value added | | | with profit margin - PM<br>• My company is normally satisfied with Economic Value Added | | |
| **GRTH** | Growth: Market-share growth, Asset growth, Net revenue growth, Net income growth, Number of employees growth | Dependent | 3 | • My company is normally satisfied with market-share growth<br>• My company is normally satisfied with net income growth<br>• My company is normally satisfied with number of employees growth | Likert scale (from strongly disagree to strongly agree). | Santos & Brito (2012) |
| **EFF** | Efficiency: Maximising outputs from given inputs, and so minimizing the costs | Dependent | 3 | • My company is normally satisfied with return on investment<br>• My company is normally satisfied with return on equity<br>• My company is normally satisfied with return on assets | Likert scale (from strongly disagree to strongly agree). | Murphy et al. (1996) |

**Appendix 2: SPSS Analysis**

**Descriptive Statistics of Computed Variable SPSS**

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| RD | 119 | 1.00 | 5.00 | 3.7311 | .88488 |
| GOV | 119 | 1.00 | 5.00 | 3.1218 | 1.28546 |
| FIN | 119 | 1.00 | 5.00 | 3.3824 | 1.16573 |
| CO | 119 | 1.00 | 5.00 | 3.8067 | 1.00657 |
| NGO | 119 | 1.00 | 5.00 | 3.5000 | 1.14795 |
| INCAC | 119 | 1.00 | 5.00 | 3.0378 | 1.08370 |
| CULT | 119 | 1.00 | 5.00 | 2.9916 | 1.16259 |
| OFIP | 119 | 2.00 | 5.00 | 4.0378 | .75957 |
| Valid N (listwise) | 119 | | | | |

## Correlation Analysis SPSS

**Correlations**

| | | RD | GOV | FIN | CO | NGO | INCAC | CULT |
|---|---|---|---|---|---|---|---|---|
| RD | Pearson Correlation | 1 | .301** | .433** | .317** | .459** | .455** | .175 |
| | Sig. (2-tailed) | | .001 | .000 | .000 | .000 | .000 | .057 |
| | N | 119 | 119 | 119 | 119 | 119 | 119 | 119 |
| GOV | Pearson Correlation | .301** | 1 | .550** | .354** | .560** | .465** | .666** |
| | Sig. (2-tailed) | .001 | | .000 | .000 | .000 | .000 | .000 |
| | N | 119 | 119 | 119 | 119 | 119 | 119 | 119 |
| FIN | Pearson Correlation | .433** | .550** | 1 | .367** | .421** | .478** | .457** |
| | Sig. (2-tailed) | .000 | .000 | | .000 | .000 | .000 | .000 |
| | N | 119 | 119 | 119 | 119 | 119 | 119 | 119 |
| CO | Pearson Correlation | .317** | .354** | .367** | 1 | .523** | .407** | .352** |
| | Sig. (2-tailed) | .000 | .000 | .000 | | .000 | .000 | .000 |
| | N | 119 | 119 | 119 | 119 | 119 | 119 | 119 |
| NGO | Pearson Correlation | .459** | .560** | .421** | .523** | 1 | .683** | .552** |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | | .000 | .000 |
| | N | 119 | 119 | 119 | 119 | 119 | 119 | 119 |
| INCAC | Pearson Correlation | .455** | .465** | .478** | .407** | .683** | 1 | .422** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | | .000 |
| | N | 119 | 119 | 119 | 119 | 119 | 119 | 119 |
| CULT | Pearson Correlation | .175 | .666** | .457** | .352** | .552** | .422** | 1 |
| | Sig. (2-tailed) | .057 | .000 | .000 | .000 | .000 | .000 | |
| | N | 119 | 119 | 119 | 119 | 119 | 119 | 119 |

**. Correlation is significant at the 0.01 level (2-tailed).

## Regression Analysis SPSS

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 2.086 | .304 | | 6.864 | .000 |
| | RD | .180 | .081 | .209 | 2.220 | .028 |
| | GOV | -.048 | .068 | -.082 | -.712 | .478 |
| | FIN | -.008 | .067 | -.012 | -.118 | .907 |
| | CO | .196 | .070 | .260 | 2.818 | .006 |
| | NGO | .054 | .084 | .081 | .639 | .524 |
| | INCAC | .193 | .078 | .275 | 2.469 | .015 |
| | CULT | -.021 | .073 | -.032 | -.289 | .773 |

a. Dependent Variable: OFIP

**Dominance Analysis**

| IV | Part Correlation | x2 | Rank |
|---|---|---|---|
| CO | 0.217 | 0.047089 | 1 |
| INCAC | 0.191 | 0.036481 | 2 |
| RD | 0.171 | 0.029241 | 3 |
| GOV | 0.055 | 0.003025 | 4 |
| NGO | 0.049 | 0.002401 | 5 |
| CULT | 0.022 | 0.000484 | 6 |
| FIN | 0.009 | 0.000081 | 7 |