

ENTREPRENEURSHIP AND REGIONAL ECONOMIC DEVELOPMENT:
EVIDENCE ON TURKISH REGIONS

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EVIDENCE ON TURKISH REGIONS**

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ABSTRACT

ENTREPRENEURSHIP AND REGIONAL ECONOMIC DEVELOPMENT: EVIDENCE ON TURKISH REGIONS

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After the 1970s crisis, economies of scale lost its importance and large firms faced with serious economic difficulties. Globalization and advancements in information and communication technology (ICT), which considerably reduced the transaction cost of information and capital, led the competitive advantage to move from large establishments to smaller and more innovative firms. Since the mid-1970s, share of small and innovative firms has begun to increase in almost all industries and in the economy as a whole. Especially, with the seminal work of Birch (1987) pointed out that small and medium sized enterprises are important vehicles for creating new jobs, the interest on SMEs and entrepreneurship has begun to gradually raise. Meanwhile, increasing evidence on the positive contribution of entrepreneurship on regional economic development and growth has led researchers and policy makers to pay a special attention to the links between entrepreneurship and economic development process. In that sense, in recent decades, entrepreneurship has been new phenomena in regional science and economic development theories as well as in various different policy documents. The mainstream of the entrepreneurship literature point out that entrepreneurship play a key role in the generation of new jobs, creation of employment, innovations, and dissemination of new knowledge that ultimately lead to economic development and growth.

The main objective of this thesis is to investigate the relationship between entrepreneurship and regional economic development and growth in the context of NUTS II regions of Turkey for the periods of 1990, 2000, and 2011. Based on this objective and the recent regional economic development models, the study firstly examines the contribution of entrepreneurship on regional economic development and growth. Secondly, the thesis investigates the reasons behind the diverse impacts of entrepreneurship on regional economic development. In that sense, the study examines the relationship between the level of regional entrepreneurial activity, represented as firm birth rates and self-employment rate, and the stages of regional economic development. Lastly, the thesis investigates the effects of the certain regional characteristics on regional entrepreneurial activity. For the empirical analysis, two analyses are used: multiple regression analysis and one-way ANOVA.

The results of the study on the contribution of entrepreneurship on economic development and growth indicate that firm births and self-employment are positively related to the economic development and growth of NUTS II regions of Turkey. However, it is observed that firm birth rate has more pronounced impact on economic development and growth than self-employment rate. In addition, firm death is found to negatively associate with economic development and growth. Furthermore, the empirical findings on the relationship between the level of entrepreneurship and the stages of economic development demonstrate that there is a U-shaped relationship between firm birth rate and regional economic development level. However, the findings also show that there is an inverse U-shaped relationship between self-employment rate and the level of regional economic development. The thesis also contributes to the knowledge about the impacts of regional economic, demographic, institutional, and cultural factors on the regional entrepreneurial activity. The results support the arguments that regional characteristics have substantial effects on regional entrepreneurial activity.

Keywords: Entrepreneurship, Regional Economic Development and Growth, Economic Development Stages, Regional Characteristics, Employment, Innovation, Knowledge Spillover

ÖZ

GİRİŞİMCİLİK VE BÖLGESEL EKONOMİK KALKINMA: TÜRKİYE BÖLGELERİ ÜZERİNDE BİR KANIT

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1970'lerdeki krizinden sonra ölçek ekonomileri önemini kaybetmiş ve büyük firmalar ciddi ekonomik zorluklarla karşı karşıya kalmıştır. Küreselleşme ve bilgi ve iletişim teknolojilerindeki (ICT) gelişmeler, bilgi ve sermaye ile ilgili işlem maliyetlerini önemli ölçüde azaltarak rekabet avantajının, büyük işletmelerden daha küçük ve daha yenilikçi firmalara geçmesine yol açtı. 1970'lerin ortalarından itibaren, küçük ve yenilikçi firmaların payı hemen hemen bütün sektörlerde ve bir bütün olarak ekonomide artmaya başlamıştır. Özellikle, küçük ve orta ölçekli işletmelerin yeni istihdamlar yaratmak için önemli araçlar olduğunu Birch'in (1987) önemli çalışmasında belirtmesi ile KOBİ ve girişimcilik üzerindeki ilgi giderek artmaya başlamıştır. Bununla birlikte, girişimciliğin ekonomik kalkınma ve büyüme üzerindeki olumlu katkısı ile ilgili artan kanıt sayısı, araştırmacı ve politika yapıcılarının girişimcilik ve bölgesel kalkınma arasındaki ilişkilere özel bir önem vermesine yol açtı. Bu anlamda, son yıllarda, girişimcilik, bölge biliminin ve ekonomik kalkınma teorilerinin yanı sıra çeşitli politika belgelerinin yeni fenomeni olmuştur. Girişimcilik literatüründeki ana akım, girişimciliğin, yeni işlerin oluşmasında, istihdamın yaratılmasında, yeniliklerde ve bilginin yayılmasında ve bunların bir sonucu olarak ekonomik kalkınma ve büyümede kilit bir rol oynadığını işaret etmektedir.

Bu tezin temel amacı, girişimcilik ve bölgesel ekonomik kalkınma ve büyüme arasındaki ilişkiyi Türkiye'deki NUTS II bölgeleri bağlamında 1990, 2000 ve 2011 dönemleri için incelemektir. Bu amaca ve son dönemdeki ekonomik kalkınma modellerine bağlı kalarak, çalışma, öncelikle girişimciliğin bölgesel ekonomik kalkınma ve büyüme üzerindeki katkısını inceliyor. İkinci olarak, tez, girişimciliğin bölgesel kalkınma üzerindeki farklı etkilerinin atında yatan nedenleri araştırıyor. Bu bağlamada, çalışma, yeni firma doğum oranı ve kendi adına çalışanlar oranı ile temsil edilen bölgesel girişimcilik faaliyeti düzeyi ile bölgesel ekonomik kalkınma aşamaları arasındaki ilişkiyi inceliyor. Son olarak, çalışma, bölgesel bazı özelliklerin girişimcilik faaliyetleri üzerindeki etkilerini araştırıyor. Ampirik analizlerde çoklu regresyon analizi ve tek yönlü ANOVA kullanılmıştır.

Girişimciliğin ekonomik kalkınma ve büyüme üzerindeki katkısı ile ilgili analiz sonuçları, firma doğumlarının ve kendi adına çalışanların Türkiye'deki NUTS II bölgelerinin ekonomik kalkınması ve büyümesi ile pozitif olarak ilişkili olduğunu göstermektedir. Ancak, firma doğum oranının ekonomik kalkınma ve büyüme üzerindeki etkisinin kendi adına çalışanlar oranından daha belirgin olduğu gözlemlenmiştir. Buna ek olarak, firma ölümü ile ekonomik kalkınma ve büyüme arasında negatif bir ilişkisi olduğu görülmüştür. Ayrıca, girişimcilik düzeyi ve ekonomik kalkınma aşamaları arasındaki ilişki üzerine olan ampirik bulgular, firma doğum oranı ve bölgesel ekonomik kalkınma düzeyi arasında U şeklinde bir ilişki olduğunu göstermektedir. Fakat bulgular, kendi adına çalışanlar oranı ile bölgesel ekonomik kalkınma düzeyi arasında ters U-biçimli bir ilişki olduğunu göstermektedir. Tez aynı zamanda, bölgesel ekonomik, demografik, kurumsal ve kültürel faktörlerin bölgesel girişimcilik faaliyeti üzerindeki etkileri konusunda da katkıda bulunmaktadır. Bulgular, bölgesel özelliklerin bölgesel girişimcilik faaliyetleri üzerinde önemli etkilere sahip olduğunu savunan delilleri desteklemektedir.

Anahtar Kelimeler: Girişimcilik, Bölgesel Ekonomik Kalkınma ve Büyüme, Ekonomik Kalkınma Safhaları, Bölgesel Özellikler, İstihdam, Yenilikçilik, Bilginin Yayılımı.

To my wife Kübra and my daughter Beyza

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CHAPTER 1

INTRODUCTION

1.1. Aim and Context of the Study

The conceptual relationship between entrepreneurship and economic development/growth has drawn attention of many researchers, economists, policymakers and politicians since the seminal work of Schumpeter (1934), putting forward that entrepreneurs play crucial roles during the process of creative destruction and are the engine of economic growth. Especially, due to a variety changes and transformations resulting from globalisation, innovations and technological advancements in economic structures which have been monitored in the world after the 1970s, this relationship has started to become a core issue in many arguments. Recently, because of its important contribution to the economic development, almost all developed and developing countries have begun to devote a significant amount of their resources to enhance entrepreneurial activity. Hence, there have been abundant academic studies and initiatives at the individual, regional and national level to explore the role of entrepreneurship in economic development.

Before explaining the link between entrepreneurship and regional economic development, these two concepts need to be identified.

The literature on the definition, measurement, determinants and examining the role of entrepreneurship in economic development is very wide. Due to increasing number of studies within diverse academic disciplines define entrepreneurship based on their research traditions, perspectives and methods, there is not a unanimous consensus on the concept of entrepreneurship (Hébert and Link 1989; Carlsson et al., 2013). The term of

entrepreneurship is therefore a multi-faceted and multi-dimensional phenomenon (Casson, 2010). The first researcher developed the concept of entrepreneurship in economic literature was Richard Cantillon (1755) who classified economic agents into three classes: (i) landowners, (ii) hirelings (employees), and (iii) entrepreneurs, while the first two agents were seen rather passive, entrepreneurs were introduced as individuals who create connections between producers and consumers. However, the most well-known definitions of entrepreneurship were made by the following scholars: while Frank Knight (1916), as a representative of Chicago tradition, defined the entrepreneur as a person who takes risks under uncertainties, Joseph Schumpeter (1934), representing German tradition, defined the entrepreneur as innovator and creative-destructor, and Israel Kirzner (1973), as a representative of Austrian tradition, described entrepreneurs as the individuals who have the alertness to exploit profitable opportunities.

On the other hand, the notions of economic development and economic growth occasionally have been used interchangeably by researchers. Economic development is identified as a process that enhances the quality of human life (Todaro, 2000 in Chamg, 2007). According to a qualitative viewpoint, three major aspects of economic development process were defined by Todaro (2000) as follows: (i) improving people's living standards through providing high accessibility to health and education services, and increasing per capita income and consumption levels; (ii) creating favourable conditions for people to increase their self-esteem; and (iii) through offering various goods and services to increase freedom of people (in Chamg, 2007). On the other hand, economic growth is described as an increase experienced in the size of the economy in a certain period of time (Allen and Thomas, 2000). In other words, Kuznets (1973) indicated that economic growth implies a quantitative increase in the capacity of goods and services. However, although both have different meaning, researchers had examined the relationship between entrepreneurial activity and economic growth/development at the regional or national levels, have used changes in Gross Domestic Product (GDP), employment, per-capita income, value added of production, and the productive capacity as the measures of economic growth and economic

development. This thesis used GDP per capita level as measure of economic development, whereas changes in GDP per capita as measure of economic growth.

As indicated in the economic and entrepreneurship literature, the role and importance of entrepreneurship in economic development/growth theories varies by the years. The regional economic development/growth issue has been addressed in different theories/models in a variety ways. In general, as indicated by Eraydın (2004), the regional economic development approaches can be examined basically in three different eras. The first era is determined between the Second World War and to the 1970s crisis that represents the assumptions of Keynesian model (1936) and Neo-classical growth theories (1950s). The second era is described as the period between the 1970s crisis and the 1990s, and the last era is identified as the period between the 1990s and to the present. These two periods represent the assumptions of endogenous growth theories.

Researchers have demonstrated that in the first era which is before the 1970s, economies of scale, agglomeration economies, comparative advantages, vertically integrated economy, government interventions, exogenous resources, infrastructure investments, and large firms were the main assumptions and drivers of (regional) economic development theories/models. Especially, due to economies of scale the industrialization process were recognized as a major player of regional economic development. In this regard, the size of firms had particular importance, and thus, large firms were used and considered as the main investment vehicles and most powerful engine of technological and economic development. Large firms began to become increasingly dominant in both innovation and production activities. The share of them rose in almost all industries and in the economy as a whole (Carlsson et al., 2013). In contrast, the importance attached to the small and independent firms gradually declined during this period. The period was referred as the “the Schumpeter Mark II regime”, where large companies outperform small firms and were being pioneers of innovative activities (Carree et al., 2002). In a similar vein, Audretsch and Thurik (2001) described this period as the period of “the managed economy” in which economic, social and political events in the economy were directed by large-scale production (Audretsch and Thurik, 2001; Thurik, 2009; Carlsson et al., 2013). As the establishment of a large firm take long time and require relatively higher amount of resources, the formation of new businesses in this period were limited,

and therefore, as compared to the subsequent periods, the levels of entrepreneurial activities were relatively lower during this period.

After the 1970s crisis, which led to fundamental changes in economic environment, times began to change (Wennekers and Thurik, 1999). The 1970s crisis resulted in serious changes in the economic growth discourses and approaches. For example, the crisis emerged in capitalism led to the recognition of the weaknesses of the branch-plant economies and the limitations of Fordism (Plummer and Taylor, 2001). Similarly, Eraydin (2004) asserts that the crisis caused to the questioning of the absolute rules of organized capitalism, which heavily depended on large-scale production and mass production. Therefore, a new industrial order took place and a shift from mass production towards flexible production occurred in this era. Flexible production and specialization were seen as a way of achieving local economic development. A new growth theory called Endogenous (Regional) Development Theories took place during this period. This growth model determined human capital, horizontally integrated economy and vertical disintegration, economic externalities, small and medium sized firms, entrepreneurial activities, and foreign investments as the essential sources of economic development. On the other hand, large firms were found slow and inflexible to adapt to new economic conditions and technological developments, and thus, most of them restructured and downsized to refocus on their core businesses. Meanwhile, the number of small and innovative firms has begun to increase in the market during this period (the 1970s crisis and the 1990s), and researchers noted that entrepreneurial activities and SMEs have become the main sources of innovative activities and the long-term regional employment and economic growth (Carree et al., 2002; Acs and Armington, 2003). Therefore, this could be described as the transition period from large firms to small firms.

In the last era, after 1990s, globalisation has played a key role in the formation of new growth theories and models. In this respect, knowledge spillover, innovations, entrepreneurial activities, learning capacity, social capital, and untraded interdependency have been considered as the significant source of regional economic development. Technological changes, especially in the field of information and communication technologies (ICT) which considerably reduced the cost of transferring

information and capital, led the competitive advantage to move from large-scale production systems to smaller and more flexible economic units (Nooteboom, 1999). Therefore, share of small firms and entrepreneurship has increased in almost all industry and in the economy as a whole. In particular, through the globalization, entrepreneurship serves as a conduit for knowledge spillover and symbolizes the missing link between economic development and the investment in the new knowledge.

As a result, the development in the information and communication technologies (ICTs), new invention and innovation, and the spillover of knowledge have resulted in the 'Third Industrial Revolution' (Jensen, 1993). In other words, Carree et al. (2002) refer the last quarter of the 20th century as the period of creative destruction in the term of the Schumpeter Mark I regime where large firms have lost control on the market and smaller firms outperform large firms through creating new products and ideas. Moreover, Audretsch and Thurik (2001) describe this period as the transition from 'managed economy' towards 'entrepreneurial economy', in which SMEs and entrepreneurship have been recognized as the engine of innovation, employment creation, and social and economic development.

Accordingly, it can be assumed that the concept of economic development and entrepreneurship are mutually interconnected. Entrepreneurship has been seen as an important stimulus and driver for countries and regions' economic development and growth. In particular, with the reduction of economic and political barriers between countries and globalization of economy, the issue of entrepreneurship has gradually become important. Baptista, Escária and Madruga (2004) argue that the role of entrepreneurship and small firms in economic development process has increased and become important particularly for two reasons: i) new technological inventions has reduced the importance of economies of scale (Piore and Sabel, 1984); and ii) the increasing speed of innovative activities and shortening life cycle of products and technologies creates a favourable environment for new entrants and small firms. Moreover, Audretsch and Thurik (2001) assume that due to increasing degree of uncertainty and risk and supporting more space for innovative activities, the role of the entrepreneurship and small firms has increased in economic development.

The mainstream literature has highlighted the remarkable three points of entrepreneurship in the context of economic development and growth (Batabyal and Nijkamp, 2012). Firstly, entrepreneurship leads to the emergence of three processes which are the emerging of new firms, growing of existing successful firms and shrinking or downsizing of unsuccessful firms. This can be considered in terms of the Schumpeter's theory of creative destruction (Fischer and Nijkamp, 2009). Secondly, entrepreneurship includes control of these processes by the owner or entrepreneur who is a risk taker. Finally, entrepreneurship requires innovation and evaluation of opportunities in competitive and uncertain market environment.

To sum up, the diverse effects of entrepreneurship on regional economic development have been determined as follows. Through creating new business which generates new capacity in the market, entrepreneurship is considered as an important driver in the generation of new jobs and creation of employment. In addition, entrepreneurship contributes to innovative activities in the market, plays crucial roles in the evolution of new industries, increases productivity and competitiveness, and revitalizes stagnating industries (Birch, 1981; Reynolds, 1994; Audretsch and Thurik, 2001; Acs, Audretsch, and Carlsson, 2003; Fritsch and Mueller, 2004; Van Stel, and Storey, 2008). Moreover, Acs et al. (2005) suggest that entrepreneurs primarily provide the spill over of knowledge, then allow the transformation of general knowledge into economically valuable knowledge and finally, pave the way for using it in the economic production process. They also point out that entrepreneurs contribute to regional economic development by serving as a conduit for the dissemination of knowledge in the context of endogenous growth theory. Accordingly, to achieve all these, the entrepreneur is a person who has to take risks, use resources effectively, and exploit opportunities in the market (OECD, 1998). Through these entrepreneurial activities the prosperity level of countries and regions and household income level gradually increase. According to Johansson (2009), entrepreneurship, as an all-embracing concept, is seen as one of the most important solution for an economically and socially better society.

In this respect, policy makers and researchers have attached great importance in exploring the role of entrepreneurship in achieving economic growth and development, in recent decades. The vast majority of the studies based on entrepreneurship agree that

establishment of new firms contributes to regional economic development (Wennekers et al. 2005; Audretsch, 2012). Both policy makers and researchers consider that entrepreneurship is one of the significant driving forces of the economic development (Urbano and Turró, 2013). Especially after the 1980s, new firm formation or entrepreneurship has been new phenomena in regional science and economic development theory as well as in various different policy documents (Stenberg, 2012).

Within this framework, the main objective of this thesis is to explore the relationship between entrepreneurship and regional economic development and growth. To understand the economic development and to identify appropriate policies for sustainable economy, researchers and policy makers need to understand the impact of entrepreneurship on economic development and growth. Especially, in this globalized world, which increases the importance of competitiveness of regions and countries, promoting entrepreneurship inevitably has been crucial for Turkey. A correct understanding of entrepreneurship is therefore important for achieving regional economic development, and even enables policy makers to use entrepreneurship as a tool for the elimination of disparities between regions in Turkey.

In this respect, the thesis has three purposes. Firstly, the thesis aims to investigate the contributions of entrepreneurship on regional economic development and growth. With this aim policy makers may understand and explore the characteristics of entrepreneurship and their contributions on the economy, and that they will be able to prepare specific development policies for the regions of Turkey. The study also will provide theoretical and empirical evidence on whether or to what extent entrepreneurship contributes to regional economic development and growth.

Secondly, the thesis aims to explore the reasons behind the diverse impacts of entrepreneurship on regional economic development. The empirical literature demonstrates that the contribution of entrepreneurship to regional or national economic development is complicated. While entrepreneurship has positive impact on some regions or countries' economies, it may have negative effect on other regions or countries' economies (Reynolds et al., 1994; Carree et al., 2002; Acs and Armington, 2004; Wennekers et al., 2005; Stam, 2006; Gries and Naudé, 2008; Fritsch and Mueller,

2004, 2008; Acs and Mueller, 2008). Researchers have determined two main reasons underlying these differences: (i) the types and/or characteristics of entrepreneurship; and (ii) the economic development stages of regions. Due to the lack of data regarding the type/characteristics of the entrepreneurship, the thesis analyzes the relationship between the level of regional entrepreneurial activity and the economic development stages of the regions. Through this analysis, policy makers and researchers can understand the link between entrepreneurship and regional economic development. This may help them to designing a map for the development of appropriate policies and strategies for the regions of Turkey.

Finally, the thesis examines the effects of the certain regional characteristics on regional entrepreneurial activity. The thesis aims to explore the impacts of demographic and socio-economic determinants of entrepreneurship and develop a framework that shows what conditions are appropriate for individuals to start new businesses. Thus, policy-makers can identify strategies and create an environment that stimulates entrepreneurs, which are recognized as the source of change, innovation, competitiveness, employment, and productivity, to start new ventures in their regions.

As a result, the thesis includes different discourses in the literature on the relationship between entrepreneurship and economic development. In general, while the above-mentioned issues were discussed and empirically tested separately in previous studies, the thesis brought together all of them and filled a theoretical and empirical gap in entrepreneurship literature. Through these analyses, on the one hand, researchers and policy-makers can easily describe the contributions of entrepreneurship on regional economic development; on the other hand, they can explore the impacts of social, demographic, and economic characteristics of the regions on regional entrepreneurship. Thus, the thesis may help policy-makers to develop more appropriate policies and strategies for achieving higher level of economic development and lower level of regional disparities across regions of Turkey.

1.2. Research Questions

Derived from the objective of this thesis, the following research questions are examined:

- (1) How does entrepreneurship contribute to regional economic development?
- (2) Why do the effects of entrepreneurship on regional economic development differ across regions?
- (3) What are the impacts of certain regional economic, demographic, and social characteristics on regional entrepreneurship?

The first question stem from the previous theoretical and empirical studies that have focused on understanding regional economic development and economic growth. The mainstream literature on the role of entrepreneurship in the process of economic development and economic growth indicates that entrepreneurship is a major source of job creation, technological advancements, competitiveness, and economic growth (Schumpeter, 1934; Birch, 1981; Reynolds, 1994; Acs, Audretsch, and Carlsson, 2003; Fritsch and Mueller, 2004; Mueller, Van Stel, and Storey, 2008).

The second question is grounded on prior studies having concentrated on examining the reasons behind diverse impacts of entrepreneurship on economic development and economic growth. The question aims to reveal that whether there is a straightforward relationship between entrepreneurship and regional economic development. Examining the contribution of entrepreneurship on regional economic development, several studies show that the contribution of entrepreneurship to economic development is controversial and may differ over time and significantly among countries and even in regions of the same country (Reynolds et al., 1994; Carree et al., 2002; Acs and Armington, 2004; Wennekers et al., 2005; Stam, 2006; Gries and Naudé, 2008; Fritsch and Mueller, 2004, 2008; Acs and Mueller, 2008).

The third question is the extension of recent studies that have examined the impact of regional factors on individuals' decision to be entrepreneurs and to start new businesses in a region (Storey, 1994; Verheul et al., 2002; Audretsch et al., 2002; Lee et al., 2004; van der Zwan et al., 2013; Kibler, 2013). This question facilitate the understanding of

regional characteristics that prevent or stimulate the formation of new businesses in a specific region.

As a result, these three questions aim to increase the knowledge of researchers and policy-makers on the role of entrepreneurship in the process of economic development and economic growth and on the conditions that push or pull individuals to start new businesses.

All these questions have been addressed at 26 NUTS II regions of Turkey for three different periods: 1987-1990, 1990-2000, and 2000-2011.

1.3. Thesis Outline

This thesis consists of eight chapters. Chapter 1 includes an introduction that briefly summarizes the purpose and scope of the thesis and indicates the research questions.

Chapter 2 comprises literature review which provides definitions of entrepreneurship. In this respect, the first section will focus on the definitions of entrepreneurship in historical perspective. The second and third section aims to explore the functional role of the entrepreneur in neoclassical growth theory and in the endogenous growth theory respectively. The fourth section provides the different functional roles of entrepreneurs in the context of schools of thought such as the thought of French School, Chicago School, German Tradition, and Austrian Tradition. In the last section different definitions and theories of entrepreneurship will be compared.

Chapter 3 gives the theoretical framework that explains the link between entrepreneurship and regional economic development in terms of innovation, employment generation and gross domestic products (GDP). Before starting to explain its effects on regional economic development, the roles of entrepreneurship in regional economic development models/theories will be investigated. This chapter also provides information regarding the underlying reasons behind diverse effects of entrepreneurship on regional economic development. In the last section, the study will focus on the impacts of certain regional characteristics on regional entrepreneurial activity.

Chapter 4 provides a wide range of empirical evidence on the functional role of entrepreneurship in regional economic development and growth. The first section provides the empirical evidence of the contribution of entrepreneurship on economic and employment growth, innovation, knowledge spillover and competitiveness. The second section has focused on the empirical evidence on the diverse effects of entrepreneurship on economic development. In this section, evidence on the impacts of different types/characteristics of entrepreneurship on economic development, and on the relationship between the levels of entrepreneurial activities and economic development stages are presented. The last section assesses the results of empirical studies that examine the impact of certain regional characteristics on regional entrepreneurship.

Chapter 5 demonstrates the main characteristics of selected proxies both for NUTS II regions and Turkey for different periods. In this respect, the first section provides information about the entrepreneurial capacity of NUTS II regions. Second section demonstrates economic development and economic growth rates of NUTS II regions and shows economic development and growth patterns on maps. Third section shows employment and unemployment rates of the regions and discusses possible reasons behind the differences among the regions. Fourth section indicates the pattern of population density and the share of population between 20-40 years old across the regions. Last section shows innovative, human capital, and financial capital capacities of the regions.

Chapter 6 consists of method, descriptions of empirical models and type and source of data. In the first section the aim and context of the thesis are demonstrated. In the second section, empirical models are constructed for each research question. In the last section, information about the variables used in empirical models and their sources are provided.

Chapter 7 gives results of the empirical estimations and interpretations. Due to three different periods this chapter has three main sections and based on three research questions it has three sub-sections under each main section.

Chapter 8 provides the summary of findings, conclusions, policy implications and recommendations for future research.

CHAPTER 2

DEFINITIONS OF ENTREPRENEURSHIP

Throughout intellectual history, the entrepreneur has taken many responsibilities, fulfilled many duties and worn many faces in various issues (Hébert and Link, 1989). In other words, the entrepreneurial function is as old as the trade and exchange between people. The term of entrepreneurship is a fundamental, multi-faceted and multi-dimensional phenomenon and sometimes it is an obscure concept (Nijkamp, 2009; Casson, 2010). Furthermore, because of the increasing number of studies within various academic disciplines such as economics, management and business administration, sociology, psychology, economic and cultural anthropology describing a variety of research traditions, perspectives and methods, entrepreneurship has developed in many subfields (Carlsson et al., 2013). In other words, it can manifest in a variety of ways such as in the formal and informal economy, in legal and illegal activities, in the innovative and conventional approach, in risky and uncertain environment, in start-up and established firms, in small and large firms, and in all economic activities (OECD, 1998). For example, within the economic framework, entrepreneurs are seen as risk takers or those who dwell in uncertainty, resource allocators and innovators. In addition, although entrepreneurship has been a long standing subject of importance in economics, there is not a unanimous consensus on the concept of entrepreneurship (Hébert and Link 1989). In other words, the authors focusing on the entrepreneurship concept have failed to agree on a clear definition (Shane, 2006), because each one has focused on different aspects of this issue. Consequently, due to the wide range of meanings, the concept of entrepreneurship has been defined in various ways (Nazir, 2012).

In this sense, in recent years the researches on entrepreneurship have flourished and evolved rapidly. There are numerous, theoretical and empirical approaches and definitions exist (Schröter, 2010) but, three of them are dominant on the definition of entrepreneurship: (i) the economic approach, which analyzes the role of entrepreneurship in economy and the economic effects of entrepreneurship; (ii) the psychological trait approach, which examines characteristic features of entrepreneurs; (iii) the social-behavioural approach, which studies both the effects of social environment and personality qualification. Generally, the theoretical definitions are wide and encompass wide-ranging entrepreneurial activities, whereas the operational definitions address a singular direction (Karlsson, Friis and Paulsson, 2004). Briefly, although the description of its origins has a long history and can be traced to the early 18th century, it is almost impossible to make a single definition on entrepreneurship (Dabkowski, 2011).

To sum up, this chapter will discuss and give place to the definitions of entrepreneurship. In this respect, the first section will focus on the definitions of entrepreneurship in historical perspective. In the second and third sections the definition of entrepreneurship in neoclassical growth theory and in the endogenous growth will be discussed. The fourth section provides the different functional roles of entrepreneurs in the context of schools of thought. In the last section different definitions and theories of entrepreneurship will be discussed.

2.1. Entrepreneurship in Historical Perspective

The economy historians such as Higgs (1991) and Blaug (1997) argue that Richard Cantillon (1755/1999), a French Classical Economist, was the first author to develop the concept of entrepreneurship in economics literature in the 1750s. In his *Essai sur la Nature du Commerce en Général* (1755), he identified the economic agents into three groups; (i) landowners, (ii) entrepreneurs and (iii) hirelings. The first and third groups are introduced as being rather passive, while the second group, entrepreneurs, is the crucial element of the economics (Grebel, Pyka and Hanusch, 2001). Cantillon identified the entrepreneur as a person who creates the connections/links between producers and consumers, and also, plays the role for ‘undertakers’ bearing the

uncertainty of non-fixed returns. He asserted that during business activities the entrepreneur could face diverse types of uncertainty. Namely, the term of uncertainty is defined as buying something at certain prices and selling at uncertain prices, which is the process of bearing the risk. However, Cantillon did not make a detailed distinction between uncertainty and risk in his definitions. In addition, Cantillon argues that the pivotal role of entrepreneurs in decentralized markets -during the decreasing of monopolies resulted in growing market and rising trade openness- is to notice the increasing number of supplier and augmenting uncertainty of returns. This means that there will be a stiff competition among entrepreneurs, so they have to be able to take risk and be stable in decision-making processes (Dabkowski, 2011).

According to Jacques Turgot (1727-1781), the entrepreneur is the product of a capitalist investment decision. Namely, he suggested that the owner of capital can do three things with his capital: First he can loan his money and become a moneylender, or he can purely be a capitalist. Second, he can buy or be opted to buy real estate to rent and become a property owner/landowner. Finally, he can decide to purchase goods to run a business and, thus become directly an entrepreneur (Grebel, Pyka and Hanusch, 2001).

It is widely accepted that the French economist Jean-Baptiste Say (1767-1832) was the first economist to introduce a systematic functional role for the entrepreneurs (Blaug, 1978). Firstly, he started with critique of the dominant approach which accepted the land as the unique source of wealth. Instead, he proposed a new approach which accepted the industry including commerce and manufacturing as the source of wealth (Ibrahim and Vyakarnam, 2003). Say also asserted that the entrepreneur was not addressed in the classical economic theory which supposed labor, capital and land as the three means of production. Therefore, to resolve the deficiency in this theory, he integrated the entrepreneur into the theory and emphasized the need for a fourth agent –entrepreneur- who can arrange other means of production and manage both production and distribution. Furthermore, contrary to Turgot, he sharply separated entrepreneurs from capitalists. According to Say, the entrepreneur can give capital to a company but he does not have to. Giving the money to the companies may induce a disregard of risk and uncertainty (Grebel, Pyka and Hanusch, 2001).

Like Jean-Baptiste Say, Von Thünen (1826) also made a sharp distinction between the entrepreneur and the supplier of financial capital, who is the Cantillon's landowner. Similar to them, Menger (1840-1921), who is one of the founders of the Austrian School, also made the same distinction¹. He described the entrepreneur as a person gathering production function (Wennekers and Thurik, 1999)².

2.2. Entrepreneurship in Neo-Classical School

Right after the Second World War, the Neo-classical general equilibrium model became the most hotly debated topic in microeconomics (Ibrahim and Vyakarnam, 2003). According to Barreto (1989), many economists such as Alfred Marshall, Leon Walras, Charles Tuttle, and Robert Solow in neo-classical school of thought use the neo-classical models to explain the relationship between production and consumption systems. Neo-Classical models are based on three main assumptions which are market equilibrium, stable preferences and maximizing behaviour (Hodgson, 1994 in Ibrahim and Vyakarnam, 2003). The general expectation in these models is that under certain conditions³ markets tend to move towards equilibrium. Also, according to the neo-classical growth theory, all economic agents have perfectly been informed about the economic system and their economic targets have been identified clearly and rationally (Wennekers and Thurik, 1999). Furthermore, to establish an efficient market, prices and incentives were determined. Besides, through the price system the fluctuations in the market are prevented instantly. Thus, to ensure equilibrium of the market, producers and consumers have to make a deal at a certain price and also, the balance between demand and supply for each product should be kept.

Alferd Marshall (1842-1924) was one of the first neo-classical economists. Like the other Neo-classical theorists, Marshall tried to determine the factors that equilibrate the market system under the certain conditions (perfect competition, perfect information, free exit and entry, the presence of homogenous goods). The main purpose of Marshall is to indicate that under the perfect competition conditions the market is in equilibrium and clear. Because of the fact that each person receives profit as much as his/her

¹ See Hébert and Link (1989)

² See Lumpkin and Dess (1996)

³ Perfect competition, the correct and excellent technological information and rational behaviour

marginal contribution to national income and production and thus during the production process excessive profit opportunities and labour exploitation have been disappearing (Bula, 2012). Although Marshall argued that large-scale production is necessary for economic innovation and progress, he aimed to create equilibrium with small innovations or changes, made by many small competitors in the market system (Schumpeter, 1942). Therefore, according to his theories, the equilibrium in supply and demand will be provided by many players ‘great men’ in the market. The theories of Marshall leave a little room for the entrepreneurial activities providing economic development. He defined the entrepreneur as a superintendent – besides the management and risk-bearing functions- who makes innovative activities to reduce manufacturing cost (Schröter, 2010).

Table 2.1: Entrepreneurship in Neo-Classical School

	Schools of Thought	Main Assumptions	The roles of the entrepreneur in economy	The effects of the entrepreneurs on economy
Entrepreneurship in Neo-Classical School	Neo-Classical School	• Growth takes place by the accumulation of production factors (labour and capital) and exogenous technological improvements • Market equilibrium, stable preferences, and maximising behaviour are its main assumptions	• It is difficult to understand the role of innovative activities • There is no room for the entrepreneur in the theory	• There is no nexus between economic growth and entrepreneurial activities • Instead of entrepreneurs the price system was used as a equilibrating mechanism

In essence, in Solow (1957) model, growth takes place by the accumulation of production factors which are labour and capital, and over time the growth reaches a steady-state economy. Thus, given the assumptions of this approach/model, there is no room for risk-taking and innovative entrepreneurs. According to Solow (1956), there was no mechanism in the neo-classical growth theory to explain the nexus between

economic growth and entrepreneurial activities. Because, according to the traditional Solow model, scale economies carry out their activities at large firms and naturally economic growth dependent on capital accumulation of these firms (Acs and Armington, 2004).

In this context, Baretto (1989) explains the several reasons why the concept of entrepreneurship was not included in orthodox neo-classical economic model in his book⁴ (Grebel, Pyka and Hanusch, 2001). Firstly, when the studies on the theory of the firm started to increase, the importance attached to the concept of entrepreneurship began to decline. Secondly, the main assumptions (rational behaviour, perfect information and production function) of the firm theory left no space for the functional roles of the entrepreneurs. Finally, he suggested that to ensure consistency in the theoretical framework of the theory of firm, instead of the human action (entrepreneurial activity) theorists focused on a mechanistic philosophy of the social world.

2.3. Entrepreneurship in New Growth Theory (Endogenous Growth Model)

The most notable researches related to analysis of economic growth are based on the theories developed by Robert Solow (1956, 1957). In his model (neo-classical economic theory), economic production was created by the interaction of labour and physical capital, but the long-rate of economic growth was achieved by supposing a fixed rate of technological progress and capital accumulation (Solow, 1957). However, in his model (neo-classical economic theory) Solow cannot explain the source of changes in technology which remains exogenous in the economic context (Minniti and Lévesque, 2010). Therefore, in order to solve this deficiency in the model, a new approach has emerged labelled endogenous growth theory or new growth theory. In endogenous growth theory, the developments in technology have been recognized as a result of accumulation of human capital within economy and knowledge so that technological progresses have been incorporated into the model (Romer, 1990, 1994). Namely, endogenous growth theory reveals the structure and causes of economic growth and the relationship between technological change and economic growth.

⁴ The Entrepreneur in Micro-economic Theory: Disappearance and Explanation The Entrepreneur in Microeconomic Theory: Disappearance and Explanation

In this respect, endogenous growth theory put more emphasis on knowledge and reveals the external effects of knowledge, as opposed to neo-classical economy, as the important factor of economic growth (Romer, 1986). In addition, according to the theory, the knowledge externalities operate at the level of individual economic agents, as entrepreneurs' role, and they may create new organizations which are crucial for economic development (Acs and Armington, 2003). Acs et. al. (2004) indicated that entrepreneur is an important tool in knowledge commercialization. According to a model developed by Romer (1990), there are two ways for developing new knowledge. Firstly, new knowledge is produced by researchers in the Research and Development (R&D) works undertaken by incumbents. This operation comprises the first mechanism to transform knowledge into growth. However, in this process knowledge is not entirely commercialized and thus an appropriate environment (opportunities) is generated by incumbents for entrepreneurs to start up new firms and exploit this knowledge (Audretsch, 2007). Secondly, the new knowledge can be generated by the start-ups which perform as an important tool for the dissemination of information (spillover of knowledge) (Acs et. al., 2012). Thus, entrepreneurship both affects the stock of knowledge and contributes economic growth (Acs et al., 2004). All these indicate that endogenous growth theory does not give an explicit task to entrepreneurs but it refers to the simple functional role of entrepreneurs that is any organization or individual seeking to maximize its profit (Dabkowski, 2011). However, in recent times several important studies regarding the role of entrepreneurs in endogenous growth model have been conducted by the several economists.

In this respect, Schmitz (1989) developed an endogenous growth model regarding economic growth and entrepreneurial activity. Because of defining the role of entrepreneurs as 'imitation' in his model, Schmitz's entrepreneur is more passive than the other models. Thus, the Schmitz model is being less effective than the Aghion and Howitt model (Carree and Thurik, 2010).

Aghion and Howitt (1997) focus on the functional role of Schumpeterian entrepreneurs as a 'creative destruction' within growth model. In Schumpeter model, growth and competition have contrasting relationship. Also, capital is removed from the model (Schumpeter model) because it is thought that competition between firms causes

innovation and thus development in technology result in economic growth in the model. Briefly, firms are motivated in hopes of obtaining rents after each innovative activity. In this sense, the significant contribution of Aghion and Howitt in endogenous growth theory is that implying the task of profit-oriented and deliberate investment in knowledge is carried out by entrepreneurs.

Table 2.2: Entrepreneurship in Endogenous Growth Theory

	Schools of Thought	Main Assumptions	The roles of the entrepreneur in economy	The effects of the entrepreneurs on economy
Entrepreneurship in Endogenous Growth Theory	Endogenous Growth Theory	• Knowledge and knowledge spill over are the primer engines of the economic growth • Growth is based on technological progress which is endogenously given • Technological changes are the result of human capital and knowledge accumulation (R&D expenditure)	• Entrepreneurs are seen as a force that responsible for dynamism in industry • And the underlying reason of long-term economic growth • The entrepreneur serves as a tool for the dissemination of knowledge • Entrepreneurship as a mechanism that transforms knowledge into economic growth	• The higher levels of entrepreneurial activities imply the higher levels of knowledge and the greater its spillovers • The entrepreneur eventually contributes to economic growth and the stock of knowledge

Peretto (1998) has developed a different endogenous growth model. In his model, Peretto focuses on the number of firms which plays a crucial role for determining R&D and returns to investment. Peretto model (1998) aims to clarify a change between the innovation from R&D conducted incumbents firms which are close to the production line ‘trustified capitalism’ and innovation from R&D conducted by inventor entrepreneurs ‘competitive capitalism’. According to the model, economy close to a stable industrial structure when the R&D undertaken by incumbent firms became an engine of growth, while R&D undertaken by entrepreneurs and start-ups firms start to decline. However, Carree and Thurik (2010) asserts that although it is true the R&D

works carried out by large manufacturing firms was the most important engine of the economy roughly between 1870 and 1970, the disappearance of entrepreneurs which are the important factor of economic growth, is a misleading feature of the Peretto model. Also, in order to compete with the incumbents and enter the market, entrepreneurs have to create new products or knowledge. Briefly, in this model, although more emphasis was attached to the corporate R&D, entrepreneurs play an important role in economic development only if a crucial number of new firms which begins to invest in R&D enter the market (Carree and Thurik, 2010).

2.4. Different Definitions of Entrepreneurship

The concept of entrepreneurship is a multidimensional and there are multiple definitions of the term (Bula, 2012). However, it is possible to classify the studies regarding the definition of entrepreneurship and its role in the economy in different ways such as chronologically, in school of thought and by the functions attributed to the entrepreneurs (Pittaway and Freeman, 2011). In this section, the different functional roles of entrepreneurs in the context of various schools of thought are discussed. According to Wennekers and Thurik (1999), although these ‘School of Thought’ share a common language and heritage, they emphasize diverse aspects of the entrepreneurship. These differences can be highlighted and expressed in different ways as follows:

- Firstly, the entrepreneur has been defined as “uncertainty and risk bearer”. In this sense, the thought of French Classical School -based on Cantillon, Quesnay and Say- and Chicago School -rooted in Knight and Schultz- has been discussed.
- Secondly, the entrepreneur has been identified as “innovator and creative destructor”. In this context, the approach of German School -represented by von Thünen, Schumpeter and Baumol- has been discussed.
- Finally, the entrepreneur has been described as “opportunity seeker”. In this regard, the consideration of the Austrian tradition -based on Menger, von Mises and Kirzner- has been argued.

In addition, in this section the functional roles of entrepreneurs in the Neo-classical Economy and Endogenous Growth Theory will be addressed. Here, the aim was to find out how much space is given to entrepreneurship and what are the roles of the entrepreneur in these theories?

The Entrepreneur as Uncertainty or Risk Bearer

Due to distinguishing entrepreneurs from salary and wage workers, bearing uncertainty and risk are important features of entrepreneurship (Knight, 1942). Also, through his/her innovation and early adoption the entrepreneur may be abundantly rewarded with rents however, to be rewarded, he/she must bear the associated uncertainties and risks (Low, 2009). In that sense, the French Classical School, which is the first school studied on the concept of the entrepreneurship, and the Chicago School emphasize this aspect of the entrepreneur. Both of them argue that entrepreneurs have the following three characteristics; bearing the cost of setting up a company, receiving uncertain compensation, and having a low level of uncertainty and risk aversion.

French Classical School

The word of entrepreneur is French origin (Hoselitz, 1960). Thus when considering the origin of the word, it is not surprising that the first scholars were French economists (Pittaway and Freeman, 2011). As mentioned in the first section, Cantillon, was the first author to develop the concept of entrepreneurship in economics literature in the 1750s, and defined the economic agents into three groups; Landowners who were financially independent aristocrats, Hirelings and Entrepreneurs who are financially dependent on others. He defined the entrepreneur as an agent who “...*set up with a capital to conduct their enterprise, or are undertakers of their own labour without capital, and they may be regarded as living off uncertainty*” (Cantillon, 1931, p. 55) whereas described hirelings those who were working for a fixed price (Hebert and Link, 1988). According to Cantillon, all the activities and circulations in the economy were triggered by the entrepreneurs (Bula, 2012). In other words, he defined the entrepreneur as a person who buys a product/good at a certain price and produces a new product/good from that product/good, and lastly, sells the (last) product/good at an uncertain price. Furthermore, he introduced the entrepreneur as a person establishing the balance between supply and

demand in the economy and identified risk and uncertainty as the most important factors of his theory.

However, Jean-Baptiste Say (1767-1832), is another important scholar of this school, examined the functional roles of entrepreneurs in a different perspective. Say developed further the Cantillon's ideas in his seminal works '*A Catechism of Political Economy (1821)*' and '*A Treatise on Political Economy (1802)*'. He identified three main agents in his theory of production and distribution: 'land' including natural resources, 'human industry' and 'capital' which include both money and machines capital. Say stressed that land and capital are absolutely necessary to the production, but he argued that human industry is the most prominent (key) element to the production (Barretto, 1989 in Pittaway and Freeman, 2011). Then he separated the human industry in three parts; knowledge, effort and entrepreneurial applications (Koolman, 1971). Say referred the entrepreneur as the most important agent in the production system and defined the entrepreneur as a manager of a firm or coordinator of the economic system, acting as a mediator between the other production actors within the risk and uncertainty (Pittaway and Freeman, 2011; Bula, 2012). However, rather than describing the entrepreneur as a risk bearer, Say introduced the entrepreneur as a person who has good reasoning capabilities (Hebert and Link, 1988, p. 38), because the main task of the Say's entrepreneurs are evaluating the firm's opportunities and choosing the most appropriate option (Say, [1803] 2001).

The Chicago School

Like the French Classical School, the Chicago school of thought tries to explain the functional roles of entrepreneurs that are bearing uncertainties or risks. One of the most important representatives of this tradition was Frank Knight. The work of Cantillon and Von Thünen had been a source of inspiration for the work of Knight (1942), revealing the unforeseen component of entrepreneurs' income, who makes distinction between uncertainty and risk in his seminal work '*Risk, Uncertainty and Profit*' (Low, 2009). Knight argued that because of the other factors leading to a change in the market conditions, in reality, supply and demand cannot be in balance. Thus, he can be distinguished from neo-classical thought from this point (Pittaway and Freeman, 2011).

Table 2.3: The Entrepreneur as Uncertainty or Risk Bearer

	Schools of Thought	Main Assumptions	The roles of the entrepreneur in economy	The effects of the entrepreneurs on economy
The Entrepreneur as Uncertainty or Risk Bearer	French Classical School	• Entrepreneurs and capitalists are separated from each other • Risk and uncertainty are the most important factors of the economic system	• Under risks and uncertainties entrepreneurs are those individuals who make better decisions about the alterations in the market • The entrepreneur acts as a coordinator of economic system and a mediator between the other economic agents within the risk and uncertainty • They act as a prime mover of market transaction	• The entrepreneur is responsible for all circulation and exchange in the market • Entrepreneurs equilibrate demand and supply in the economy • They push economy towards equilibrium
	The Chicago School	• Since the other forces change the market condition, demand and supply cannot be in balance • In case of the 'disequilibrium', the rate of risk and uncertainty increases in the market • An important distinction has made between risk which is predictable, calculable and insurable and uncertainty which cannot be predicted	• The entrepreneur has responsibility to interpret changes in the market and benefit from these conditions successfully under risk and uncertainty • Entrepreneurs reallocate resources in the market to cope with the situations of disequilibria	• Entrepreneurs push economy towards equilibrium • They provide economic growth

Furthermore, Knight (1942) asserted that in case of disequilibrium in the market, the rate of uncertainty will begin to increase and the entrepreneurs are capable to notice the changes in the market and will take responsibilities and benefit from these conditions successfully. In this sense, Knight determined that the entrepreneur as a person who purchases a good in a certain price and create a new product/good from it and sell it at an uncertain price under uncertain conditions.

In his famous dissertation (Risk, Uncertainty and Profit) which was the first comprehensive study by him, Frank Knight (1921) aimed to explore the effects of risk and uncertainty on the entrepreneurial activities like profit and investment decisions. He defined the entrepreneur in the context of uncertainty and the entrepreneur's gain as the award of the decisions taken under uncertainty (Ibrahim and Vyakarnam, 2003). To Knight, "*it is this true uncertainty ... which gives the characteristic form of 'enterprise' to economic organisation as a whole and accounts for the peculiar income of the entrepreneur*" (Knight, 1921, p 232). In addition, the ability to take responsibilities under risk and uncertainty was defined as the important distinguishing feature of entrepreneurs, which differentiates them from wage and salary workers (Knight, 1942; Casson, 2003 in Low, 2009). In this study, unlike previous scholars, he revealed significant differences between risk and uncertainty. In this respect, risk is predictable, calculable and insurable matter of fact, whereas uncertainty cannot be predicted and it is unknown (Wennekers et al., 2005).

The distinction made between uncertainty and risk reflects Knight's opinion of profit. According to Knight, profit is generated just under uncertainty. Also under perfect competition with risk which is predictable and insurable, he associated the neoclassical assumption of zero profit (Ibrahim and Vyakarnam, 2003). In his own words, risk cannot be an obstacle to the full realization of the competitiveness; it does not prevent excellent planning, or cause profit (Knight, 1921, p 21). Namely, due to including uncertainty in general equilibrium model, the role of price system that equilibrate the system was eliminated and the entrepreneur started to take this role (for equilibrating market). Thus, to adjust the market system entrepreneurs take responsibility under risk and uncertainty and make decisions (Ibrahim and Vyakarnam, 2003). This means that the functional roles of entrepreneur in the market system violate the assumptions of the neo-classical

economy (Emmett, 1999; Ibrahim and Vyakarnam, 2003). Therefore, the entrepreneurs not only acquire net profit by taking responsibility in this complex system, but also provide a certain level of income to the producers (Casson, 2003).

The Entrepreneur as Innovator or Creative Destructor

Innovation and creativity are the other crucial attributes of the entrepreneur because they are closely linked to the capability to cope with disequilibrium in the market. The most comprehensive studies relevant to this aspect of entrepreneurship were made by the members belonging to the German Tradition. In this respect, the thought of this school is discussed in this subsection.

The German Tradition

The German tradition determines the entrepreneur as the practitioner of creative destruction, an innovator, a creator and source of inspiration (Schumpeter, 1934; Baumol, 1968). In addition, the economists in the German tradition, unlike the economists in Neo-classical School, describe the entrepreneur as the vehicle of economic development and as the source of disequilibria in market (Nazir, 2012). The tradition put forwards that the disequilibrium is the inherent of market dynamics and objects to the ‘orthodox’ neo-classical model’s strict assumptions including rational behaviour, perfect knowledge and perfect competition. In a similar way, the contributions of the prominent representatives of the German tradition are clarified as follows.

Johann Heinrich von Thünen (1783-1850) was one of the first economists addressing the term of entrepreneur in the German tradition. He focused on the marginal productivity and argued that economic rents are generated by spatial variation and earned at the margin of production (von Thünen, [1826] 1960 in Low, 2009). Von Thünen (1826), like Jean-Baptiste Say and Cantillon, made a sharp distinction between the entrepreneur and the supplier of financial capital. Moreover, Von Thünen, in his best known work ‘*The Isolated State*’ (1850), put forwarded a description of profit that clearly differentiated the return of the entrepreneur from the return of the capitalist. Namely, Von Thünen described the entrepreneurial gain as profit minus (i) interest on invested

capital, (ii) insurance against business losses, and (iii) the wage of management (Hebert ve Link, 2006, p. 52).

Joseph Schumpeter (1883-1950), who is one of the most important representatives of the German tradition, made remarkable contribution to the theory of entrepreneurship. Schumpeter's (1934) fundamental approach has been reflected in his book '*Theory of Economic Development*' and in his article '*The Fundamental Phenomenon of Economic Development*'. He described a new concept of entrepreneurship that is considerably different from the other approaches. In his theory, Schumpeter (1934) focused on the functional roles of the entrepreneur, defined as the main reason of economic growth, in the development process.

In contrast to the previous widespread view of entrepreneurship which described the entrepreneur as a risk bearer, a capitalist, and a firm manager, he defined an entrepreneur as an engine of economic growth, a leader and an innovator (Schröter, 2010). Schumpeter argued that the innovative entrepreneurs transform ideas and innovations into economic assets which bring gains (profit-generating) (Baumol, 1990). In addition, he does not see all businessmen/managers as entrepreneurs, because Schumpeter describes the manager as a person who usually undertakes the day to day activities of firm, while defines the entrepreneur as a person who provides the leadership and vision of the organization (Ibrahim and Vyakarnam, 2003). Thus, instead of deciding on how to follow the goals, the main task of the entrepreneur is to decide which goals to pursue (van-Praag, 1999, p 311). Also, Schumpeter makes a distinction between the capitalist and the entrepreneur. The capitalist was defined as the supplier of capital. However, Schumpeter determined that if the entrepreneur increases his/her own capital, he/she can both be the capitalist and the entrepreneur, but each one has different functions. While the role of entrepreneur is to determine the opportunities in the market, in general, modern capital markets force him/her to find a capitalist to bear the risk in the market for him (Evans and Jovanovic, 1989 in Ibrahim and Vyakarnam, 2003, p. 12). Nonetheless, in order to protect his/her own capital under uncertainty, the supplier of capital tries to decline the risk for the entrepreneur by ensuring fairness in the business.

In the Schumpeterian theory, the main aim was to discover the entrepreneurial activities, which result in economic growth and innovation, and disrupt the business cycle, within the general equilibrium system (Ibrahim and Vyakarnam, 2003). Therefore, Schumpeter asserted that the equilibrium in the market cannot be provided with allocating of existing resources, because the market is a dynamic process. In this regards, it is considered that the Schumpeter's entrepreneur, unlike Knight, Schultz and Kirzner, pushes the economy out of the equilibrium by introducing new goods or production methods, and thus destroying the old patterns of action and thought (Schumpeter, 1942).

In this context, the role of entrepreneurship is seen as the driving force of economic growth in 'Joseph Schumpeter's theory of long waves' (Sanyang and Huang, 2005; Nazir, 2012). Schumpeter accepted that any person who conducts 'new combinations' is an entrepreneur. He defined new combinations of production factors as a discovery process of entrepreneurial activities that will become the pivotal part of the vehicle that leads to economic development. These new combinations are the right ways to meet the present demand or introduce new goods, often in 'a process of creative destruction' make existing products and technologies obsolete (Sanyang and Huang, 2005; Schumpeter and Opie, 1983 in Low, 2009; Nazir, 2012). In this sense, the growth in innovative entrepreneurial firms will occur in two ways; firstly getting market share from existing supplier and secondly, increasing demand for the products presented in the market by enlarging the borders of economic activities, (Sanyang and Huang, 2005). Thus, the process of creative destruction, which changes the market structure through the intentional entrepreneurial activities, is done on dynamic and can be favourable for profit opportunities and additional innovations (Nazir, 2012), because Schumpeter argued that continued innovative studies and competitions are great opportunities for long-run economic growth and technological progress. In other words, he declared that innovation as a strategy which stimulates economic development; thereby, innovation is the main characteristic of entrepreneurship for economic development (Schumpeter and Opie, 1983 in Low, 2009). For Schumpeter, innovation is the basic premise of economic

development and he described this innovative process as “*the carrying out new combination*”, with five various cases⁵.

Table 2.4: The Entrepreneur as Innovator or Creative Destructor

	Schools of Thought	Main Assumptions	The roles of the entrepreneur in economy	The effects of the entrepreneurs on economy
The Entrepreneur as Innovator or Creative Destructor	The German Tradition	- Entrepreneurs as the vehicles of economic development and as the source of disequilibria in market - With innovation the existing structures of the market will be disrupted - Institutions are important factors that determine economic growth	- The entrepreneur carries out new combinations of production (new good, new method of production, new market, new source of supply, and new organization of any industry) - The entrepreneur converts ideas and inventions into economically viable assets	- Entrepreneurs lead to technological breakthroughs - Entrepreneurs have disturbing force on economy (causing waves of creative destruction) - Entrepreneurs push economy out of equilibrium - The entrepreneur creates profit opportunities

In historical perspective, Shumpeter (1934) and Baumol (1968) share an analogous approach on the functional role of the entrepreneur in economic development (Dabkowski, 2011). Like Schumpeter, Baumol introduces the entrepreneur as an agent who creates change and disequilibria in the market, in the process of the creative destruction, through the innovation. However, differently from Schumpeter, William J. Baumol (1990), in his seminal article ‘*Productive, Unproductive, and Destructive*’, argues that institutions have played an important role in the process of economic development. In his 2008 paper, Baumol indicates that social events and institutional arrangements affect the amount of entrepreneurial endeavours and also, these factors can

⁵The introduction of a new good or a new quality of a good; the introduction of a new method of production; the opening of a new market; the development of a new source of supply or raw-materials or half manufactured goods; the carrying out of a new organization of any industry (Schumpeter, 1934, in Dejardin, 2000, p. 2)

specify the allocation of entrepreneurship (Wennekers and Thurik, 1999). Therefore, Baumol (1993, 2008) asserts that entrepreneurial activities are not always possible to increase the productivity. Baumol argues that *“the exercise of entrepreneurship can sometimes be unproductive or even destructive, and that whether it takes one of these directions or one that is more benign depends heavily on the structure of payoffs in the economy – the rules of the game”* (Baumol, 1990, p. 899 in Wennekers and Thurik, 1999). In this sense, Baumol (2007) clearly separates productive, unproductive and destructive entrepreneurship from each other.

The Entrepreneur as Opportunity Seeker

Alertness to profit opportunity is another important feature of the entrepreneur. The occurrence of disequilibrium in the market means profit opportunities for the entrepreneur. Hence, entrepreneurs strive to benefit from these opportunities through recognizing the gaps and unnoticed opportunities in the market. This functional role of the entrepreneur has been uncovered by the Austrian School of Thought.

Austrian School of Thought

Austrian tradition, in terms of the approach, content and character, is different from the mainstream Neo-classical economics. Because of the ignoring the market process and matching all objectives/plans of the economic agents, the market would be unnecessary in the equilibrium theory (Grebel, Pyka and Hanusch, 2001). However, in a state of disequilibrium the objectives/plans of the economic agents will be different from each other. In this instance, the agents firstly revise and calculate the economic problems, and then adapt to the new conditions of the market. Therefore, the agents have to constantly develop new strategies and thus create a dynamic process (market process) (Grebel, Pyka and Hanusch, 2001). In this respect, the modern Austrian approach, unlike Neo-classical general equilibrium (with its strict assumption), aims to reveal whole processes in the market economies and explain how put the market in equilibrium from initial disequilibrium situations (Kirzner, 1997).

For this purpose, Mises ([1949] 1996) had tried to solve this issue with the ‘human action’ which express human creativity and ingenuity. Such action was seen as the

engine of economic growth. According to Mises there were a plenty of opportunities in a state of disequilibrium, and when the agents alert to these opportunities, they take an action to improve their position. Actually, this is the entrepreneurial process defined by Kirzner. However, in contrast to Kirzner who narrowed the ability of human action to a certain group of agents called entrepreneurs, Von Mises accepted it to the all of the economic agents (Grebel, Pyka and Hanusch, 2001).

Another point of view was put forward by Hayek (1945). It is known that once disequilibrium and dynamic change happen in the markets, entrepreneurs alert to opportunities and improve their knowledge by consciously making informed investment as different from the other economic agents (Fiet, 1996; Hayek, 1945 in Busenitz et. al., 2003). Therefore, Hayek (1945), unlike mainstream neo-classical economics, emphasized of knowledge and learning in the entrepreneurial process (Ibrahim and Vyakarnam, 2003). However, during this process, the entrepreneurs not only experience learning, but also partial ignorance. While the ignorance was defined as a consequence of uncertainty regarding the future, the learning was described as a consequence of adjustment in the behaviour of buyer and seller to carry out their operations at an optimum level (Alvarez and Busenitz, 2003). In this respect, the entrepreneurial process can be defined as a process of discovering of the existing information in the market and creating links between different tacit knowledge.

In recent years, Austrian tradition has been represented by Israel Meir Kirzner who is a follower of Von Mises and Hayek. Kirzner establishes his theory on the basis of Mises' human action theory. Any changes in preferences or a new invention in production technique causes the alteration (disequilibrium) in the market which was originally in equilibrium (Kirzner, 1997). According to Kirzner, when there is a state of equilibrium in the market, there is no profit opportunities and any field of activities for entrepreneurs because everyone is busy to conduct his/her initially determined task. However, as mentioned above, if changes occur in the market, the economy will be pushed out of equilibrium and thus, entrepreneurs will find many opportunities to increase their profits.

In this case, Kirzner (1979) defines the entrepreneur as an agent who is alert to unnoticed opportunities which have not been recognized by the other economic agents. The focal point of Kirzner's concept of entrepreneur is alertness which is an unplanned and unconscious learning process undertaken by entrepreneurs spontaneously through their interaction with the economic agents in the market (Ibrahim and Vyakarnam, 2003). Therefore, entrepreneurs have to always be alert to make new surprises and discoveries. Thus entrepreneurs as an arbitrageur can exploit and discover the existence situation of disequilibrium in the market for making profit (be able to buy them at low prices and sell at higher prices) (Kirzner, 1973). Kirzner also defines this constant discover as somewhere in between a pure chance and a deliberate search. By this means, entrepreneurs play crucial role in the market process. Furthermore, unlike Schumpeterian entrepreneurs in terms of 'creative destruction', the essential functional roles of Kirznerian entrepreneurs are to equilibrate the market by sustaining the alertness (Tieben and Kirzner, 1997).

Table 2.5: The Entrepreneur as Opportunity Seeker

	Schools of Thought	Main Assumptions	The roles of the entrepreneur in economy	The effects of the entrepreneurs on economy
The Entrepreneur as Opportunity Seeker	The Austrian School	• The market generally is imperfect and at the state of disequilibrium • The existence of a state of imbalance in the market means profit opportunities for entrepreneurs • Entrepreneurship has especially an important role in stimulating economic growth	• Alertness to hitherto unnoticed profit opportunities • The entrepreneur explores the gap in the market and takes advantages of this situation • The entrepreneur corrects deficiencies and inefficiencies in the market	• The entrepreneur eliminates the errors in the market • Entrepreneurs push economy towards equilibrium • Entrepreneurs provide an improvement in market structure

2.5.Comparing the Theories of Entrepreneurship

The question of ‘what is entrepreneurship or who is entrepreneurs’ is answered in term of the schools of thought as above. However, each theory has distinctive approach while trying to answer this question. The differences between these theories will be discussed in this sub-section.

As mentioned above, the first attempt on the definition of entrepreneurship was made by French classical school. The difference between French classical school and neo-classical school can be explained as follows. Throughout the economic history, the importance of functional roles of entrepreneurs for economic development has always been emphasized, yet in orthodox neo-classical economic theory the subject of entrepreneurship has almost never been detected. The reason of this situation is that if entrepreneurs had taken place in orthodox theory, the theory could be faced with the risk of losing its consistency (Grebel, Pyka and Hanusch, 2001). Therefore, it may be explicitly expressed that classical economists (French classical school) had addressed this issue more than neo-classical theory.

Solow (1956) argued that there was no mechanism in the neo-classical economy to explain the relationship between long-term economic growth and entrepreneurial activity, because firstly, the perfect competition implies that there is no chance of making profit in the market for entrepreneurs. Secondly, innovative entrepreneurs’ dynamics does not take place in this process of general equilibrium. On the other hand, according to the endogenous growth theorists (i.e., Arrow (1962), Romer (1986), Lucas (1988), Jones (1995), and Young (1998)), the accumulation of traditional production factors which are capital and labour, could not explain long-term growth in the economy. In addition, in the earlier neo-classical models technological growth is seen as exogenous “manna from heaven” (Wennekers and Thurik, 1999). Therefore, the underlying cause of the long-term increase in labour productivity could not be explained in neo-classical model.

As mentioned in the previous section, Frank Knight (1921) was one of the most important proponents of Chicago tradition. In his famous dissertation (Risk, Uncertainty and Profit), Frank Knight (1921) aimed to explore the effects of risk and uncertainty on

the entrepreneurial activities (i.e., profit and investment decision). In his study, he revealed significant differences between risk and uncertainty. In this respect, he argues that risk is predictable and insurable event while uncertainty is not predictable and insurable (Wennekers et al., 2005). However, this distinction was not made in neo-classical theory. Neo-classical economics has ignored the concept of uncertainty rather it argues that rational agents in economies always act with a consistent probability (Choi, 1993). For this reason, to evaluate the future expectations, economic agents just apply probability theory (Ibrahim and Vyakarnam, 2003). In addition, similar to endogenous growth theorists, Knight argues that there is no room for entrepreneurial activities within the strict assumption of general equilibrium models.

Furthermore, the differences between neo-classical economic theory and German tradition can be described as follows: In neo-classical economy, technological progress or innovation change and knowledge are exogenously given so that there is no room for entrepreneurs in the theory. However, German tradition, which is one of the substantial thoughts that criticise the neo-classical theory, defines the entrepreneur as an agent who is a creator, an innovator and an applicator of creative destruction. In this respect, in German tradition, entrepreneurs are identified as an engine of economic growth and the main reason for disequilibrium in economy (Nazir, 2012). In addition, German tradition, like endogenous growth theory and Chicago Tradition, rejects the ‘orthodox’ neo-classical model’s strict assumptions including rational behaviour, perfect knowledge and perfect competition and put forwards that the disequilibrium is the inherent of market dynamics.

According to Austrian tradition, in the state of disequilibrium the agents have to constantly develop new strategies and thus create a dynamic process (market process) (Grebel, Pyka and Hanusch, 2001). In this case, plenty of opportunities emerged in the market and some agents (entrepreneurs) alert to these opportunities to improve their position. In this perspective, Austrian tradition, unlike Neo-classical economy (with its strict assumption), tried to explain whole processes in the market economies and revealed how an economy reach a state of equilibrium from initial disequilibrium situations (Kirzner, 1997).

Wennekers and Thurik (1999), however, demonstrate the difference between Austrian and German tradition as follows: While German tradition creates opportunities in the market through innovative process or creative destruction process as described “the carrying out new combination”, the alertness of these opportunities is provided by Austrian tradition. Furthermore, Grebel, Pyka and Hanusch (2001) argue that although both Kirzner and Schumpeter built up their approaches on the criticisms made on general equilibrium theory, both focused on different aspects of entrepreneurship. While Kirzner examined the market process, Schumpeter demonstrated a more overall approach about entrepreneurship which causes economic change. From a different view point, Yu (1997) asserts that whereas Kirzner’s entrepreneur is an agent who ensures equilibrium in the economy by exploiting opportunities in disequilibria, Schumpeter’s entrepreneur is an applicator of creative destruction that prevents the economy to reach a state of equilibrium.

CHAPTER 3

THEORETICAL FRAMEWORK

In recent years a number of researchers have attempted to answer the question of ‘how the economic growth and entrepreneurship are interrelated’.

Although the growth of economic progress is affected by many other factors such as saving propensity, education, climate, presence of infrastructures, human capital, social capital and technological advancements, entrepreneurship is seen as a prominent factor for economic growth (Nazir, 2012). In other words, while Sala-i-Martin (1997) argues that there are a large number of economic and non-economic factors that can affect economic development; Porter (1990) asserts that entrepreneurships are at the heart of national advantage. In this vein, entrepreneurship has been recognized as the source of change, innovation, competitiveness and productivity. Thus, entrepreneurs have been the fundamental agents of growth theories, distribution and production, and also they play a crucial role in fostering the emergence of new market opportunities. Indeed, as the driving force of economic development, entrepreneurship has been found as the major element in the economy. Ultimately, a high level of entrepreneurship means a high level of new firms that contribute to new job creation, innovation, and development (Acs and Audretsch, 1988).

Accordingly, in this chapter, the first section aims to explain the connection between entrepreneurship and economic development. Due to its role in this relationship, we will draw attention to the ‘Schumpeterian regime switch’. In this respect, we will discuss the changes experienced in the economic structure in the period before 1970s (i.e., reduction in the rate of business ownership) and the period thereafter (i.e., increasing in the rate of business ownership in most developed economies). However, in particular, we will

focus on the second period (after 1970s) for explaining **“how does an increased in the rate of business ownership (entrepreneurs) result in a structural transformation in the markets or economies and contribute to economic growth”**.

In the second section, the relationship between entrepreneurship and regional economic growth particularly in terms of innovation, employment generation and gross domestic products (GDP) has been discussed. However, before starting to explain its effects on regional economic development, the roles of entrepreneurship in regional economic development models/theories will be investigated. This section is also trying to find **“how does and to what extent entrepreneurship contribute to regional economic development”**. In addition, the effects of the informal sector which is one of the most hotly debated issues in recent times, on entrepreneurial activities and regional economic development will be explained.

The third section will be dedicated to finding out an answer to the question **“why the effects of entrepreneurship on regional economic development differentiate across regions”**. The underlying reasons of these differences are; at first the different economic development stages of regions, and second the different types/characteristics of entrepreneurship.

Last section aims to explain the relationship between certain regional characteristics and the number of entrepreneurship. In addition, it reveals the features of regions which lead to entrepreneurs to start an activity in that region. In this respect, the impacts of certain regional economic, demographic and socio-cultural characteristics on regional entrepreneurship will be examined.

3.1. ENTREPRENEURSHIP AND ECONOMIC DEVELOPMENT

3.1.1. Schumpeterian Regimes

The fundamental of the hypothesis that entrepreneurship and economic development have a very close and positive relationship is undoubtedly based on the Joseph Schumpeter's (1911) early works which is the theory of long waves (it is mentioned above) (Dejardin, 2000; Nazir, 2012). In his book *The Theory of Economic Development* (1934), Schumpeter draws attention to the role of the entrepreneur as the primary reason for economic development. He explained how innovative entrepreneurs struggle with established large firms by developing new invention and ideas which make existing products and technologies obsolete. This has been the most prominent feature of the process of creative destruction and has been named as the Schumpeter Mark I regime. However, in another book that is *Capitalism, Socialism and Democracy* (1950), as the opposite of the above, Schumpeter emphasises the innovative activities of established large companies. In this study, he aimed to explain how large companies perform better than small firms in the appropriation and innovation process by increasing R & D activities and getting positive results from new innovations. As a process of creative accumulation, it is an essential feature of the Schumpeter Mark II regime. According to (Carree et. al., 2002; Van Stel et. al., 2005; Carree and Thurik, 2010), either of Schumpeterian technological regimes may be dominant in any given industry structure and time period. They argue that it may be due to many reasons such as the presence of knowledge, demand variety, opportunities, the institutional structure, the degree scale of (dis)economies, etc.

In this context, it may be implied that the market is dominated by a few monopolistic firms and a capitalist structure is a matter of the Schumpeterian Mark II regime, whereas in the Schumpeterian Mark I regime the numbers of small firms increase rapidly and they begin to become the engine for economic growth. In order to clearly reveal the differences between these regimes and to understand the role and importance of entrepreneurship in the economy, we will discuss the period before and after 1970s.

The period before 1970s

According to (Wennekers and Thurik, 1999; Carree et. al., 2002; Wennekers et al., 2010; and Carlsson et al., 2013) a large part of the 20th century can be defined as a period of accumulation. From the 2nd Industrial Revolution through the 1970s, the large firms began to become increasingly dominant in both innovation and production activities and also the share of them rose in almost all industries and in the economy as a whole (Carlsson et al., 2013). At the same time, the importance given to the entrepreneurial activities gradually decreased during this period. For these reasons, it was described as the period of scale and scope (Chandler, 1990). In other words, from the late 19th century and through most part of the 20th century, Chandler put emphasis on the importance of investment in production, distribution, marketing and R&D which required for benefiting from economies of scale and scope. Actually, investments and the importance paid to large companies clearly demonstrate that there was little room in the market place for small and independent firms in the period (Wennekers et al., 2010). Therefore, it is likely to argue that the period illustrates the features of the Schumpeter Mark II regime in which decline occurred in the proportion of small firms in most industries until the mid-1970s.

The period after 1970s

In the economic sense, however, after the 1970s times began to change. Following the ‘twin oil crises’ in the 1970s, portrayed as a combination of slow growth and inflation, fundamental changes in economic environment took place (Wennekers and Thurik, 1999). Many large firms were faced with serious economic difficulties. They were found slow and inflexible to adapt to new market circumstances (Carlsson et al., 2013). Nevertheless, in order to focus again on core business, some of the large firms have been restructuring and downsizing. Meanwhile the number of entrepreneurs (small firms) has started to increase in the market and researchers have found that the small firms have come at the forefront of long-term regional employment growth, technological progress and economic growth (Carree et al., 2002; Acs and Armington, 2003). Therefore, according to Jensen (1993) the development in communication technology, new inventions and the spill over of knowledge began the ‘Third Industrial

Revolution'. In addition, Piore and Sabel (1984) argue that an 'Industrial Divide' has occurred in this period. In other words, the last quarter of the 20th century may be described as the period of creative destruction in the term of the Schumpeter Mark I regime where small firms challenge established large firms by creating new products and ideas (Carree et al., 2002). Through this period many established large firms have been losing control on the market and could not compete against the new, small and innovative firms. As a result, because of the technological developments, flexibility, and specialization in the economy the importance attached to entrepreneurship, which is more capable to adapt such rapid changes, has rapidly increased since the mid-1970s.

There is ample evidence that proves these structural transformations in economy. Since the mid-1970s, the share of self employment has started to rise in most developed economies (Acs and Audretsch, 1993; Thurik, 1999; Carree et. al., 2002). In this respect, several authors have attempted to demonstrate evidence of the increase in the proportion of small and entrepreneurial firms. Birch (1981) argues that small firms have made substantial contribution to employment creation after the mid-1970s. Thus, the causes of the structural change in most advanced capitalist countries become increasingly clear. An analysis made by Balu (1987) shows that a reversal trend towards less self-employment in the U.S. has positively changed the technological, institutional, economic and industrial structure of the U.S. He also indicates that while the proportions of both the male and female self-employed in non-agricultural U.S. labour force decreased during the most 20th century, since the mid-1970s the proportion has started to rise (Carree et. al., 2002; Wennekers et al., 2010). According to Steinmetz and Wright's (1989) analysis, an increase since the mid-1970s in self-employment is statistically significant. In addition, Acs et. al. (1994) observes that during the 1970s and 1980s an increase was experienced in the self-employment rate in 15 out of 23 OECD countries. They also demonstrated that the rate of self-employment in OECD countries increased from 8.4% in 1978 to 8.9% in 1987. As one of the most impressive instances, the employment share of 500 largest American companies, denominated as Fortune 500, declined from 20% in 1970 to 8.5% in 1996 (Carlsson, 1999; Carlsson et al., 2013). In this sense, Audretsch and Thurik (2001) argue that the growth rate of business ownership was lower during the years 1974-1986 than during the years 1986-1998 for

16 out of 23 OECD countries. In addition, they indicate that during the 1990s this growth gradually began to accelerate. Wennekers and Thurik (1999) indicate that between 1988 and 1998, employment growth in small businesses was greater than their larger counterparts.

All these empirical evidence suggests a transition from a Schumpeterian Mark II type regime towards a Schumpeterian Mark I type of regime (Carree et. al., 2002). Ultimately, the scale needed to continue to exist in many sectors would be less required than the previous period. Additionally, Jensen (1993) asserts that small, effective and entrepreneurial firms which result in technological development have begun to gain more importance in the economy. Thus, because of the fact that they cannot keep up with these structural changes in the economy, numerous capital and labour-intensive firms are either downsized, or restructured, or moved to emerging economies such as China, Thailand, Bangladesh, and India.

3.1.2. Transition from managed economy towards entrepreneurial economy

The transition as depicted by Schumpeter (1934, 1950) was also described by Audretsch and Thurik (2001). As mentioned above, the last quarter of the 20th century has witnessed many fundamental changes, i.e., established large firms both have experienced intensive lay-offs (particularly the traditional manufacturing sectors) and concentrated on core competences (businesses), and small innovative firms have started to become a pioneer of technological developments (Van Stel et. al., 2005). All these major changes experienced in economic structure have given clues about how entrepreneurs would play a key role in the economic development in the future. In this perspective, Audretsch and Thurik (2001) asserted that a shift from the type of ‘managed economy’ towards that of the ‘entrepreneurial economy’ has been experienced in modern economies between the mid-1970s and the early 1990s. This transition has led to a dramatic economic switch and radical change in the role of entrepreneurship. In the former model, ‘managed economy model’, economic, social and political events in the economy are directed by powers of large-scale production, which reveals the dominance of production factors of labour and capital as the sources of competitive advantage (Audretsch and Thurik, 2001; Thurik, 2009; Carlsson et al., 2013). Through the

competitive advantages of scale and scope economies, the products are able to reach large markets. Thereby, large firms became the decisive factors in the development of the economy in this model (Karlsson, Friis and Paulsson, 2004). However, in the latter model ‘the entrepreneurial economy model’ economic, social and political events in the economy are engaged by knowledge which is gradually dominated in the production system and by the other factors as the capacity to create entrepreneurial activity and entrepreneurship capital (Thurik, 2009). According to the model, small and young firms have become as the engine of social and economic development in most of developed countries. Also, Thurik (2009) argues that without new, young and small firms the spill over of knowledge or R&D which leads to the production of new products, in the environment would be impossible. Therefore, increasing outsourcing by large firms and the growing number of small firms can be seen as a reaction to greater dependence on knowledge and flexibility, as a factor of production, and these have led to rapid development of technology and increasing global competition (Sanyang and Huang, 2005). In addition, according to Audretsch and Thurik 2001; Carree and Thurik 2002, due to channelling the entrepreneurial ambitions of individuals, coping with the increasing globalization conditions and having a greater tendency and flexibility to innovation, the number of smaller firms have rapidly increased since the mid-1970s.

3.1.3. Reasons for this transition

All in all, the increasing level of GDP per capita and its results, new inventions and innovations, developments in the communication technology and worldwide diffusion of new knowledge are seen as the crucial driving forces of these transitions⁶. In this regard, instead of the endogenous growth theorists underlined the importance of R&D and human capital in the production function, recently various economists have paid an increased attention to the concept of entrepreneurship as a third driver of job creation and economic growth (Vivarelli, 2013). Especially, through their new firms, entrepreneurs will be able to take advantage of the opportunities derived from new ideas and knowledge that are not completely recognized and not released to the market by the

⁶ A shift from the type of ‘managed economy’ towards that of the ‘entrepreneurial economy’ or a transition from a Schumpeterian Mark II type regime towards a Schumpeterian Mark I type of regime.

established large firms (Carree and Thurik, 2006; Audretsch et al., 2006; Braunerhjelm et al., 2010; Acs et al., 2012).

Several reasons behind the revival of self-employment and small business in modern economies have been discussed in the literature. However, it should be noted that depending on the level of development of the countries, the timing and extent of this alter can differ from country to country. In this context, these reasons can be listed as follows:

Firstly, the information revolution (the revolution in telecommunications and computers) and globalization has drastically reduced the effects of the comparative advantage of traditional industries such as automobile, textiles, machine tools and metalworking production in Western Europe Countries (Carree et. al., 2002). They also reduce the cost of switching information or knowledge and capital from high-cost location towards low-cost location in the world. This implies that the economic activity in high-cost location may lose its continuity. By contrast, through the globalization the comparative advantage of high-cost locations shifts to knowledge-based activities (Audretsch, 2007). The most important evidence is that the numbers of biotechnology and software industries have gradually increased from the late 1970s. Thus, entrepreneurs have become an important agent in these new sectors. Consistently, Acs and Audretsch (1987) asserted that small firms can adapt faster and be more innovative in such a highly innovative sectors than larger firms, and thus the rates of entrepreneurial activity has started to increase in the markets.

Secondly, as previously noted, the last 25 years of 20th century was defined as the ‘Third Industrial Revolution’ by Jensen (1993) and also as the periods of creative destruction. In other words, technological change experienced towards the end of the 20th century has been seen the most important determinant of spread entrepreneurial activities (Carree et. al., 2002; Wennekers et al., 2010). In this regard, the developments in new industries like nanotech, biotech and ICT have considerably reduced the significance of scope and scale economies in many traditional industries in the period. In addition, the ICT revolution provides not only advance network economies and lower transaction costs, but also it results in development in new Internet-based business models which

allow reaching numerous people at low cost (Wennekers et al., 2005). Meredith (1987) asserts that smaller firms are more capable of than the larger counterparts in the production and application of technological advances. Thus, through recent developments in the information technology the small technology-based firms began to compete with incumbent firms and the numbers of them have gradually increased (Jovanovic, 1993).

Thirdly, privatization and deregulation processes have spread across the world. According to OECD report (1995), deregulation and privatization efforts have strongly and effectively emerged in countries like Finland, Italy, Sweden and Australia. In this vein, Philips (1985) argues that small firms, in the U.S. in the early 1980, play crucial roles in creation of new job opportunities and new businesses in deregulated industry sectors. This implied that entrepreneurship is engine of employment creation and economic growth which are the greatest desire of the governments. Hence, governments started to acknowledge and support entrepreneurs achieved these successes.

Fourthly, as mentioned above, after the oil crises in 1973 established firms have tended to focus on 'core competences' (Carlsson, 1989) so that the 1980s were depicted as the period of divestment and corporate spin-offs (Jovanovic, 1993). In other words, Loveman and Sengenberger (1991) emphasize two important effects of industrial restructuring in this era which are the formation of new business communities, and vertical disintegration and decentralization. The main reason for these rapid changes in the market structure was seen as the reduction in transaction costs. In addition, Wennekers and Thurik, (1999) argue that private and public policies supporting small enterprises have accelerated this process.

Fifthly, individual income and wealth have increased significantly among OECD countries over the past decades (Wennekers et al., 2010). Due to this increase significant variations have emerged in consumers' demands and preferences (Jackson, 1984) and they have endeavoured to achieve 'higher' needs (Carree et. al., 2002). Thus, new business opportunities arise. In this respect, for supplying these new and special products, many new ventures have started to emerge and gain ground in market.

Finally, in the theory of human needs and motivation, Maslow (1970) argues that the former may be related to occupational choice. He also asserts that even if the social and basic needs of individual are met, a high level of prosperity will stimulate him/her need for self-realization and autonomy which offers self-employment as an appropriate option. In addition, recent studies show that in developed countries, although self-employed people have poor working conditions, long working hours and other unfavourable conditions, they have more job-satisfaction than employees (OECD, 2000; Wennekers et al., 2010). This could be related to autonomy feature of entrepreneurs. Therefore, while comparing to previous periods self-employment has been more highly emphasized and begun to be preferred as an occupational choice. For example, according to Schiller and Crewson's (1997) report, about 25% of young workers prefer to be self-employment in the U.S.

Consequently, all these factors do not have a constant effect but some of these have only a temporary effect. For instance, while the effects of deregulation wave and outsourcing are likely to disappear, new technological advances may show more permanent effect in market. Indeed, the impact of these structural changes in economic development has been strengthened by growing diverse demands for services and specialized goods and by the higher level of self-realization which is induced by higher level of prosperity (Carree et. al., 2002).

3.2. ENTREPRENEURSHIP AND REGIONAL ECONOMIC DEVELOPMENT

3.2.1. How Does Entrepreneurship Contribute to Regional Economic Development

Over the past three decades, researchers and policy makers draw attention to the role of entrepreneurship in regional economic development in terms of innovation, employment, productivity, new business formation, and socio-economic development. The vast majority of the studies based on entrepreneurship agree that establishment of new firms contributes to regional economic development (Wennekers et al. 2005; Audretsch 2012). Therefore, both policy makers and researchers consider that entrepreneurship is one of the significant driving forces of the economic development (Urbano and Turró, 2013). Hence, especially after the 1980s, new firm formation and entrepreneurship have been new phenomena in regional science and economic development theory as well as in various different policy documents (Stenberg, 2012). Thus, recently, research on the impacts of regional characteristics on entrepreneurial activities and on to what extent and how entrepreneurship affects regional economic development has become as a central area of inquiry within the studies on regional development.

In this respect, in order to better understand the roles of entrepreneurship on regional economic development this section firstly focuses on the changing roles of entrepreneurship in territorial (regional) economic development theories/models in historical perspective. After that, the section will try to answer the first research question of this thesis that is “**how does entrepreneurship contribute to regional economic development?**” In accordance with this question, the section respectively will uncover the effects of entrepreneurship on regional economic growth, employment generation, and innovation. In addition, the relationship between informal self-employment and regional economic development has been introduced in the last part of the section.

3.2.1.1. The Relationship between Entrepreneurship and Regional Economic Development/Growth Theories

Regional development and entrepreneurship, which have their own literature, are two separate fields. To date, the (regional or territorial) economic development/growth issue has been addressed in different theories/models in various ways. Depending on the main assumptions of these theories/models, the roles of entrepreneurship in regional economic development have constantly changed. While there is no room for entrepreneurship in the neo-classical growth theories, entrepreneurship has been considered as the fourth growth factor in the new growth theories, by referring the different roles of entrepreneurship such as serving as a conduit for knowledge spillover, making innovation and technological developments and generating employment. Examined in chronological order it could be seen that particularly since the 1980s, the importance attributed to entrepreneurship in terms of small and medium enterprises (SMEs) have gradually increased. However, before 1970s, since the economy of scale approaches were at the forefront, the size of the firms was important so that large firms were dominant in the economies, and that would allow a limited number of new businesses formations. Therefore, it is essential to understand and discover the relationship between entrepreneurship and economic growth theories/models.

In general, as indicated by Eraydın (2004), the regional economic development approaches can be examined basically in three different eras. Accordingly, the first era is determined between the Second World War and to the 1970s crisis. The second era is described as the period between “twin oil crises” in the 1970s and to the 1990s, and the last era is identified as the period between the 1990s and to the present. While the first period represents the assumptions of Keynesian model (1936) and Neo-classical growth theories (1950s), the last two periods represent the assumptions of (regional) endogenous growth theories. In this context, the relationship will be discussed for these three periods.

Entrepreneurship and Traditional Growth Theories: From World War II to 1970s crisis

The main assumptions of the regional economic development theories⁷ are firstly discussed in the period between the Second World War and 1970s crisis. Before the 1970s, regional economic development was dependent on two fundamental assumptions: redistribution of income and welfare policies of the state. In addition, the main concern of this period was based on the elimination of regional disparities and ensuring economic growth. To accomplish these, traditional growth theories argued that government interventions, exogenous resources, and infrastructure investments, conducted by state are the major fundamental tools.

In particular, in this period, 1930s economic depression and WWII had led to the emergence of Keynesian welfare state policies that introduced state as the main actor of economic development and represented a planned developmentalist approach. According to the Keynesian growth model, state acts as an actor to contribute to nation-building process by reducing regional disparities, to minimize the risks resulting in economic crisis, and to ensure the continuity of Fordist-based production and accumulation. In a similar direction, Tekeli and Pınarcıoğlu (2004) put forward that the economic development of a region is provided by the realization of production and infrastructure investments in the respective region. Thus, it could be argued that regional external resources and (government) interventions may provide a more effective use of local resources, and that may help the reduction of the regional disparities.

Eraydın (2004) in this framework has pointed out that regional economic growth in this period requires exogenous resources (i.e., the reallocation of resources and investments by state, and foreign direct investments (FDI)). Eraydın in her seminal work also

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- ⁷ At the macro-level **Keynesian Theory** (Keynes, 1936) and **Neo-classical Growth Theory** (Solow, 1957 and Swan, 1956) were on the agenda. These theories, with their production functions, leave no room for entrepreneurship in economic development. Three main assumptions were dominant in these theories; exogenous resources, government intervention and infrastructure investments.
 - According to territorial growth theories literature, **Economic Base Theory** (Hoyt, 1954; Douglass, 1955) and **Growth Pole Theory** (Perroux, 1955) were on the agenda. They attracted attention to the roles of large firms and large entrepreneurs in regional economic development. Especially, Perroux-style growth poles and growth centres has seen large firms as vehicles of fostering new technologies and innovations, dynamic changes, and generating new production and organization methods in regional and national economies (Plummer and Taylor, 2001a).

summarizes the factors that lead to regional economic development in this period as follows; agglomeration economies, economies of scale, large-scale production and investment, vertically integrated economy, externalities, traded interdependency, and capital accumulation-investments dynamics (Çiçek, 2013). Therefore, it could be considered that regional economic development/growth take places through the effective use of regional internal dynamics along with the external interventions.

To sum up, during this period, the main emphasis was on the large firms and their activities. In addition, due to economies of scale and scope, comparative advantage as described tax reduction, cheap land, and low utility charges has been another important tool for economic development in this period. Particularly, after the Second World War, economies of scale gained importance and thus the industrialization process were recognized as a major player of regional economic development. Accordingly, the size of the firms had a particular importance, and therefore, large firms are recognized and used as the main investment vehicles. However, because of the limited capital and large firms need to more capital, the establishment of them requires more time and more efforts, referring limited entrepreneurial activities during this period.

Apart from large firms, during this period, government also acted as an entrepreneur and plays an essential role in the market, planning, production, and investments. Eraydın (2004), in this context, has asserted that the economic policies developed during this period have embraced the necessity of government intervention to ensure continuity in economic growth, and thus, the system in the creation of these policies is centralist and gradual.

All these show that government/state provides regional economic growth to eliminate regional inequalities, directly or indirectly, through large-scale projects and large companies. Therefore, large firms began to become increasingly dominant in both innovation and production activities, and also the share of them rose in almost all industries and in the economy as a whole (Carlsson et al., 2013). On the other hand, the importance given to the small and independent firms gradually decreased during this period. Hence, it is likely to argue that the period illustrates the features of “the Schumpeter Mark II regime” in which the rate of small firms in most industries has

declined until the mid-1970s. In a similar vein, Audretsch and Thurik (2001) described this period as the period of “the managed economy”⁸ in which economic, social and political events in the economy are directed by powers of large-scale production, which reveals the dominance of production factors of labour and capital as the sources of competitive advantage (Audretsch and Thurik, 2001; Thurik, 2009; Carlsson et al., 2013).

As understood here, the entrepreneurial activities in this period take place in large organizations. Wennekers and Thurik (1999), in this direction, declare that entrepreneurship not only happens in the form of new small firms⁹, but also it can occur in the form of corporate entrepreneurship, new ideas and products created by existing large firms. Consequently, as already mentioned, because the establishment of large firms required a long and costly processes, the formation of new businesses/firms in this period were limited. Therefore, as compared to the subsequent periods, the levels of entrepreneurial activities were relatively lower during this period.

The Effects of 1970s Crisis on Regional Growth Theories and Entrepreneurial Activities: From the 1970s to the 1990s

The economic crisis experienced in the 1970s -which resulted from some major problems including the breakdown of Bretton Woods’ agreements, the excessive rise in oil prices, and the slow-down economic growth in developed countries- has been recognized as a significant breaking point by the researchers and scientists in the context of economic growth theories. This crisis led to serious changes in the economic growth discourses and approaches. Plummer and Taylor (2001), for example, indicate that the crisis emerged in capitalism led to the recognition of the weaknesses of the branch-plant economies and the limitations of Fordism. In a similar direction, Eraydın (2004) states that the economic crisis in the 1970s caused to the questioning of the absolute rules of organized capitalism, which heavily depended on large-scale production and mass

⁸ To detailed information see the previous section.

⁹ There is no exact definition of small and medium sized firms (Çelebi, 2003). In other words, there is no definition that is acceptable for everybody, everywhere and every time. According to entrepreneurship literature the definition of small firms may vary depending on time, place, and person. However, although there is no general consensus among scientists and researchers, small firms generally identified as firms within less than 200 or 250 employees.

production. In addition, Eraydın (2004) demonstrates the emergence of economic collapse especially in regions with a high concentration of large firms has created a great disappointment on growth discourses established on economies of scale, state intervention, return to scale, and expansion of market share. In contrast, since some regions with a high concentration of small and medium-sized enterprises (SMEs) were least affected in the economic crisis, and furthermore recovered in a short time and began to grow, emerging as new approaches the new industrial districts and flexible production organization were attracted an increasing attention. Therefore, it could be argued that transformations or changes in political and economic spheres in this period resulted in changes in development strategies, and that enabled the emergence of new approaches in growth theories. In this respect, while the growth theories before the 1970s crisis drawn attention to the state intervention, economies of scale, large-scale production and firms, and mass production, the theories after the crisis highlighted the global competitiveness, the privatization policies, small and medium sized firms, entrepreneurial activities, and foreign investments.

As a result, after the 1970s crisis, (regional) economic growth models based on government interventions, exogenous resources, and infrastructure investments were replaced by new regional development approach, called Endogenous Regional Development Theories, based on internal dynamics. Endogenous growth approach in this period identified sources of regional economic development as local dynamics and values such as collective entrepreneurship and human capital, as well as horizontally integrated economy and vertical disintegration (Tekeli and Pınarcıoğlu, 2004). Apart from economic factors, social capital also gained importance in the context of regional economic development. In this line, it is argued that regional endogenous growth models attach three main dimension of development: the political dimension, the socio-cultural dimension, and economic dimension (Mouleart and Sekia, 2003 in Armatli-Köroğlu, 2004). Moreover, endogenous growth models drawn attention to the increasing returns and economic externalities, resulted from spatial agglomeration of small and medium sized enterprises (SMEs). Therefore, endogenous growth models, in this period, revealed that regional development can be achieved by the mobilization of internal dynamics and the development of creativity. In this direction, the general discourses of

endogenous growth models can be summarised as follows: increasing returns, agglomeration/clustering of SMEs, and the economic externalities. Thus, it could be argued that the growth theories after 1970s focused on regional/local resources, dynamics, and potentials rather than external resources and interventions.

In this sense, Scott and Storper (1987) and Glasmeier (1994) have argued that this crisis was considered as the end of the Fordist-type of production and the emergence of a new industrial order. Regarding to these debates, in this period, researchers working on spatial development have highlighted the significance of **flexible production** and **specialization**, taking place in ‘clusters’ and ‘industrial districts’, as a way of obtaining and sustaining local economic development and international competitiveness (Brusco, 1982; Piore and Sabel, 1984; Storper, 1993; Çiçek, 2013). Hence, it is widely recognized that transition from mass production to flexible production, which is also known as a shift from large firms towards small firms, enable regions to more easily adapt to technological advancements and social, economic and cultural changes.

Within this framework, models (i.e., flexible production and specialization model¹⁰, and new industrial districts model¹¹) based on endogenous growth theory demonstrate that SMEs/entrepreneurship is one of the important vehicles for achieving regional economic development. In particular, during the 1970s crisis, success stories of some regions (i.e.,

¹⁰ **Flexible Production And Specialization Model (Scott, 1988; Scott and Storper, 1992; Storper, 1995):** “As a model of local economic development the flexibility model is technologically driven and hinges on the local integration of firms through the exchange of goods and information” (Plummer and Taylor, 2001, p. 224-225). Scott (1988) argues that through this integration the transaction costs of firms will reduce and they can take advantages of external economies of scale and scope. In this framework, technological leadership can be provided by reciprocal-trust relationship between buyer and supplier, together with potentialities of human resources and institutional support (Plummer and Taylor, 2001). In addition, differently from mass-production mode, flexible production model emphasizes both R&D activities and the role of small and medium-sized firms.

¹¹ **New Industrial Districts (Becattini, 1979; Scott, 1988):** New industrial districts model emerged as an approach that describes the regional development process. New industrial districts model was emerged based on discourses of Marshallian industrial district theory which use the concepts of agglomeration and external economies to formulate this idea. According to industrial district approach small firms from the same or interconnected branches of industry, particularly with intense relationships, have tendency to locate close to each other for benefiting from external economies in infrastructure, knowledge and labour market (Scott and Storper, 1987; Storper, 1993). In addition, Eraydin (2001) supposes that because locally embedded relations, regional production organizations and regional agglomeration are essential, industrial districts also depended on the concepts of joint action. Within this framework, the main characteristics of new industrial districts can be described as follows: spillover of knowledge, global and local networks, accessing new information, innovation activities, entrepreneurial activities, low transaction costs, creative environments, skilled labour market pooling, supplying intermediate inputs and services, and trust and reciprocal interrelations.

Third Italy that is the centre of craft-based and design-intensive small firms; Silicon Valley which is the centre of high-tech small firms; and London that is the centre of finance and service-based small firms) have increased the importance of SMEs and entrepreneurial activities in terms of economic development. In addition, Wennekers and Thurik (1999) assert that stagflation and high unemployment in the 1980s led to the appearance of a new interest in supply side economic and in factors providing economic development. In this context, they define the period between the 1970s and 1990s as the period of re-evolution and renewed attention to the role of small firms and entrepreneurship. On the other hand, many large firms in this period were found slow and inflexible to adapt to new economic conditions and technological advancements, and therefore, most of them have been restructuring and downsizing (Carlsson et al., 2013). In addition, established large firms in this period began to lose their weight on the market and could not compete against the new, small and innovative firms. Thus, during this period, the importance of 'Fordist' firms reduced (Piore and Sabel, 1984), and thus the share of large firms in the market started to decline.

In a nutshell, after the economic crisis, entrepreneurial activities and SMEs have been accepted as the agent of innovative activities, long-term regional employment growth and regional economic development (Carree et al., 2002; Acs and Armington, 2003). In addition, the flexibility of small firms has been recognized as competitive advantages and thus, in case of economic turbulences small firms can act more flexible (Wennekers and Thurik, 1999). Consequently, since the 1970s crisis, the share of small firms have expanded in many markets and in many developed economies. Many economists and policy makers have considered new and small firms as the source of economic growth, employment and innovation. All these have created an increasing interest on the subject of entrepreneurship. Thus, the 1970s and 1980s could be seen as the transition period of large firms towards small firms.

The Effects of Globalization on Regional Growth Theories and Entrepreneurial Activities: After the 1990s

Since the 1990s, in the globalization era, significant changes have taken place in the regional development approach. For example, after the 1980s, the unexpected

developments in volumes of international trade and the significant increase in capital mobility between countries have dramatically changed pre-existing development approach based on the strong role of nation-state in restricting, orienting and/or regulating such flows (Ascani, Crescenzi, Iammarino, 2012). Thus, globalization radically has led to the elimination of economic institutions of the nation-state level, as recognized in the post-Second World War period. In addition, globalization contributes to the emergence of successful production systems and the evolution of industrial organization, in the context of transition from Fordist-based production to flexible production, to withstand the increasing competitive pressure of international markets (ibid.). Therefore, with the globalization, standardized production systems were replaced by the more flexible, specialized, and demand-driven production units, appeared as a way of dealing with increased competition, and thus firms will be able to survive in an increasingly uncertain environment. Accordingly, it is argued that globalization on the one hand increases competition, but on the other hand generates a variety of opportunities such as new markets, new networks, and new consumers for firms or regions (Eraydın, 2004).

Apart from the above effects of globalization, the increasing technological advancements, global competition and flexible structure of economic institution, resulting from globalization, force regions and firms to compete in an increasingly uncertain and complex economic environment. In this direction, in order to compete, firms and regions have to adapt to changes in technology and new competition conditions. In other words, to ensure sustainable economic development regions can use their advantages that arise from their embedded qualifications and can direct their accumulation to innovative and creative activities (Eraydın, 2004). Hence, the importance of regional networks, innovation, creativity, and region-specific knowledge arise in such an environment (Keeble et al., 1998, 1999).

In addition to these, through the development in the information and communication technologies (ICTs) globalization has created a borderless world and it also has generated new types of entrepreneurship that use local and global networks. Within this framework, Eraydın (2004) points out that by re-evaluation of the local values, the units participating in the global network may facilitate the circulation of them on a global

scale. All these bring the importance of networks on the agenda in the context of sharing of knowledge, production and the other opportunities. Thus, the local systems (especially entrepreneurs) playing active roles in global production use these networks to increase regional economic growth and competitiveness.

As a result, within the globalized economy, knowledge, innovation, entrepreneurial activities, learning capacity, social capital, and untraded interdependency have been recognized as the crucial sources of regional economic development. While the local production dynamics has been losing its importance, knowledge economy becomes more pronounced in this highly competitive environment. In this period, regional production has become dependent of networks, collective learning and tacit knowledge. Hence, since the 1990s the importance given innovation, learning and knowledge has gradually increased. In this respect, the emphasis on endogenous factors has risen in this era and regional economic development/growth has been theorized in three models: innovative milieu¹², learning regions¹³, and regional innovation systems¹⁴.

¹² **Innovative Milieu** (Aydalot, 1986; Maillat and Lecoq, 1992; Maillat, 1995, 1996): Innovative milieu theory was established by GREMI during the 1980s, and with the contributions of Aydalot (1986) and Perrin (1989). Innovative milieu theory describes spaces as source of development and innovation. The theory is depended on the relationship with actors and actors' environment. Through this relation innovation and synergies take place in the environment. Malmberg and Sölvell (1997) identify an innovative milieu as a segment of territory with common behavioural practices and a technical culture in which knowledge can be developed, disseminated and stored. In this respect, they determined four main characteristics of such milieus: (1) a group of actors (firms and institutions) that are relatively autonomous in decision- making and strategy formulation; (2) a specific set of material, immaterial, and institutional elements combining firms, infrastructure, knowledge, know-how, authorities, and legal frameworks; (3) interaction between actors based on cooperation; and (4) a self-regulating dynamic that leads to learning (Malmberg and Sölvell, 1997, p. 11). These characteristics use local dynamic in the innovation processes. The theory also gives a particular importance to entrepreneurship and the interaction between them.

¹³ **Learning Regions** (Camagni, 1991; Florida, 1995): Learning regions emerged as a future concept of regional economic development. The learning economy emphasizes learning capacities for the economic success of nations, regions or firms (Lundvall and Johnson, 1994). The main actors (i.e., policy-makers, politicians, trade unions, chambers of commerce, public research establishments, higher education institutes, and companies) in the learning region theory are connected with each other strongly, but in a flexible manner and they participate in intra- and inter-regional learning processes (Çiçek, 2013). In addition, innovation and factors contributing to innovative activities are the crucial elements of learning regions. Briefly, learning region theory creates advantages through generation, dissemination and use of new information and knowledge that needs entrepreneurship, skilled workers, social capital, intra- and inter-regional networks, good governance and institutions, higher educational facilities, and firms. Human capital is another important factor of learning region (Florida, 1995). Moreover, due to facilitating the flow of goods, capital, people and information, communication, physical, and manufacturing infrastructure are necessary for learning regions. Within this framework, entrepreneurship plays crucial role in learning region in terms of regional economic development and competitiveness. (See Florida (1995) for detailed information).

Within this framework, since the 1990s, nation-state is recognized as a partner of global governance, and also organizations or enterprises are taken into account as the crucial parts of local and global networks (Çiçek, 2013). Along with these changes, the importance given entrepreneurship has increased. In this perspective, Ascani et al. (2012) put forwards that entrepreneurs, by managing and providing the flow of capital and goods across countries and regions, have contributed the elimination of national borders. Also, the increasing importance of entrepreneurship and small firms in this period has been considered as a response to the changes caused by globalization as a way for them to keep pace with new economic environment and competitive condition.

In this respect, since the 1990s share of small firms or entrepreneurship has risen in almost all industry and in the economy as a whole, and researchers have found that the small firms have come at the forefront of long-term regional employment growth, technological progress and economic growth (Carree et al., 2002; Acs and Armington, 2003). Especially, with the globalization, entrepreneurship serves as a conduit for new knowledge and knowledge spillover and symbolizes the missing link between economic development and the investment in new knowledge. Thus, in recent development models, spillover of knowledge, learning capacity and innovation appear as the crucial roles of entrepreneurship. In this respect, Van Stel et. al. (2005) argue that the increasing number of business ownership or independent entrepreneurship can be beneficial for unemployment reduction, employment generation and economic growth both in emerging and developed economies. In addition, Sobel (2008) suggests that productive entrepreneurs are the crucial source of wealth creation and economic growth so entrepreneurial activities are vital to regional economic development.

¹⁴ **Regional Innovation System** (Cooke and Morgan, 1998; Cooke, et al. 1997): Regional innovation system emerged

as a mixture of elements of the following theories: regional innovation system, learning regions and innovative milieu (Cooke and Morgan 1998; Braczyk, Cooke and Heidenreich 1998). Regional innovation system (RIS) takes into account spatial elements as well as system of innovation elements (OECD, 2007). Garlick, Taylor and Plummer (2007) describe RISs as a combination of regional characteristics enabling firms to benefit from technology at the regional scale, and thus contributing regional economic development. In other words, RIS achieves regional development by means of cooperative actions and collective learning. In this respect, the main factors forming the regional innovation system can be summarized as follows: innovation and innovation policy; small and large firms; entrepreneurs: knowledge: skilled workers; universities; learning and training; the relations between actors (universities, firms, entrepreneurs, NGOs, etc.), hard and soft infrastructure, social, financial and human capital; networks; trust; R&D activities; and NGOs.

All in all, the development in the information and communication technologies (ICTs), new invention and innovation, and the spillover of knowledge result in the ‘Third Industrial Revolution’. In other words, the last quarter of the 20th century may be described as the period of creative destruction in the term of the Schumpeter Mark I regime where small firms challenge established large firms by creating new products and ideas (Carree et al., 2002). Conversely, during this period many large firms have lost their dominance in the market and could not compete against the new, small and innovative firms. In addition, Audretsch and Thurik (2001) describe this period as the transition from ‘managed economy’ towards ‘entrepreneurial economy’ in which economic, social and political events in the economy are engaged by knowledge which is gradually dominated in the production system and by the other factors as the capacity to create entrepreneurial activity and entrepreneurship capital (Thurik, 2009). According to the model, small and young firms (or entrepreneurship) have been recognized as the engine of social and economic development in most of the developed countries.

Overall evaluation of the three periods

Since the 1950s the development concepts, theories and policies have rapidly changed, depending on the alterations in the world economic development regimes. In this respect, economic development approaches are categorized into three separate periods. Parallel to these growth models/theories, the role of entrepreneurship also has changed and it has been examined in these three different periods.

In the first period which is before the 1970s, (regional) economic development theories/models were founded on the following concepts: comparative advantages, economies of scale, agglomeration economies, vertically integrated economy, traded interdependency, government interventions, exogenous resources, infrastructure investments, and large firms. In this period, the main economic development principles were based on the elimination of regional disparities and the equitable distribution of economic resources and welfare. To achieve these, government acted as a decision maker and directly intervened regional actors. In addition, due to economies of scale entrepreneurial activities were conducted by large firms. Consequently, as mentioned above, because the establishment of large firms required more time and costly processes

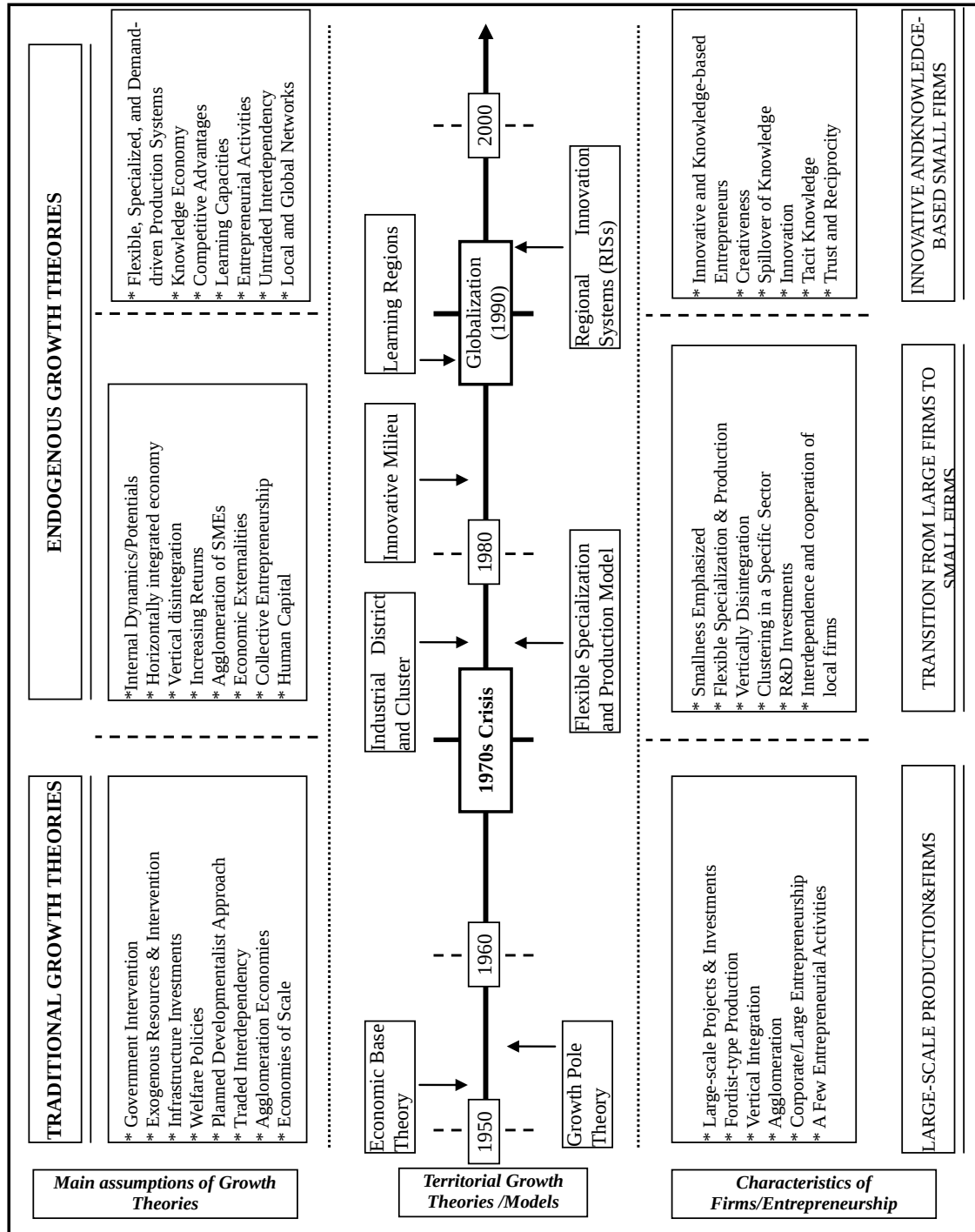
the formation of new businesses/firms would be limited, and therefore there were a few entrepreneurship during this period.

On the other hand, in the economic sense, after the 1970s, times began to change. Following the 1970s crisis, portrayed as a combination of slow growth and inflation, fundamental changes in economic environment took place (Wennekers and Thurik, 1999). With this crisis the limitations of Fordism become evident and thus a new industrial order took place. In other words, a shift from mass production towards flexible production, as known a transition from large firms to small firms, happened in this period. Hence, a new growth theory took place, called Endogenous (Regional) Development Theories. In this sense, flexible specialization and production model, as a territorial growth models, considered as a way of achieving local economic development. In a nutshell, economic development approach in this period (between the 1970s and 1990s) determined regional economic development sources as follows: collective entrepreneurship, human capital, horizontally integrated economy and vertical disintegration. Moreover, endogenous growth models drawn attention to the increasing returns, the economic externalities, the global competitiveness, the privatization policies, small and medium sized firms, entrepreneurial activities, and foreign investments. In addition, because large firms were found slow and inflexible to adapt to new economic conditions and technological advancements, most of them have been restructuring and downsizing (Carlsson et al., 2013). Thus, in this period, the share of small firms have expanded in many markets and in many developed economies. Especially, after the 1970s crisis, entrepreneurial activities and SMEs have been accepted as the agent of innovative activities, long-term regional employment growth and regional economic development. Therefore, this could be described as the transition period from large firms to small firms.

Lastly, since the 1990s local potentials and dynamics have been considered as the fundamental components of regional economic development. In this period globalization has played an important role in shaping the regional development models/theories. Within the globalization, standardized production systems were replaced by flexible, specialized and demand-driven production systems. In addition due to globalization, technological developments, global competition regions and firms have pushed into

uncertain and complex environment. In this respect, adaptive capacities have gained importance during this period. Therefore, small firms or entrepreneurship, innovation, knowledge and learning capacities become the major element of regional economic development models. Apart from these elements, untraded interdependency, social capital, human capital, skilled workers, networks, tacit knowledge, and trust have been considered as the key factors for regional economic development. Within this framework, since the 1990s, nation-state is recognized as a partner of global governance. Also, instead of intervene, government prefers to support and direct enterprises. Consequently, since the 1990s, entrepreneurship or small firms due to playing important role in the creation and spillover of knowledge, innovative activities, learning processes and economic growth, the importance given to them has been increased and they have been recognized as the most important actors of regional economic development. Therefore, in the last three decades, especially in the developed economies important policies have been implemented to increase the number of entrepreneurship, and that the rate of entrepreneurship has rapidly increased. Briefly, due to the globalization, entrepreneurship has defined as the engine of social and economic development in the majority of developed countries.

Figure 3.1: Entrepreneurship and Regional Economic Development/Growth Theories



3.2.1.2. The Content and Context of Regional Economic Development and Entrepreneurship in Contemporary Theories

At the first, the content of the regional economic development will be discussed in this sub-section, and later, the roles of entrepreneurship in the development processes will be examined.

Regional economic development includes different dimensions like: economic (i.e. new firm formation, entrepreneurship, regional economic growth, new jobs, employment); infrastructure (i.e. transport, water, energy, communication, governance, and software infrastructure); resources/competences (i.e. entrepreneurial, human, social and financial capital); governance/institutions (i.e. regulations, policies, local and central government, NGOs); outlook (i.e. traditions, life-style, culture); and life-setting (i.e. rural, peripheral, and urban area) (OECD, 2009).

According to Cécora (1999), regional economic development also intends to alter human behaviour and socio-economic structure of the region into sustainable, beneficial and desirable levels. In addition, regional development is expressed by Fischer and Nijkamp (2009) as spatially uneven alterations in regions' system. Regional development thus can be expressed as a social and economic change or transformation of a locality or region.

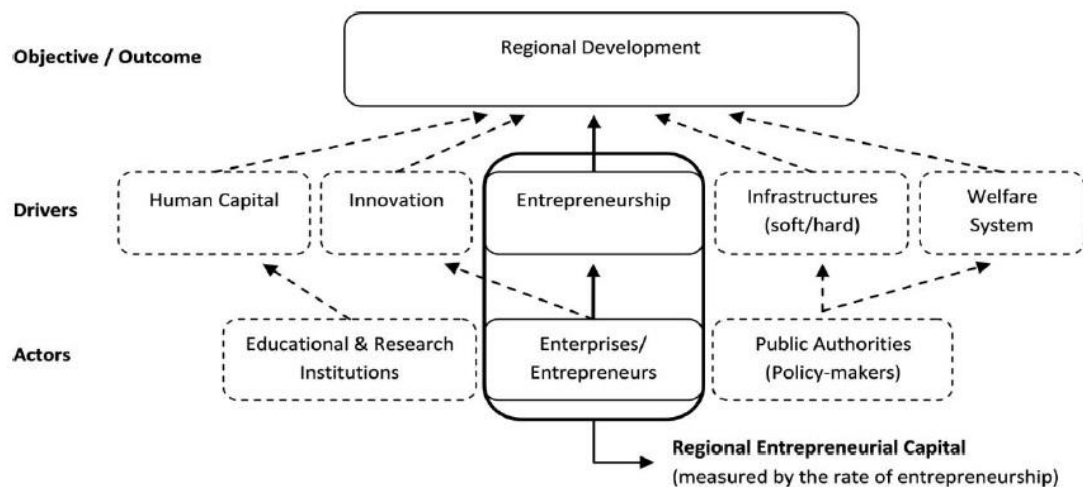
To simplify, regional economic development refers to two fundamental points in market-driven world (Fischer and Nijkamp, 2009). The first main point is necessarily related to the socio-economic prosperity, particularly employment. Thus, job creation which is one of the most important tools of creating economic wealth is vitally important. The second point is the capacity to provide and maintain economic development in terms of growth in local income and GDP and employment generation.

Figure 3.2 indicates crucial factors mentioned in the extant literature that accelerate regional economic development. Namely, these impetuses are: the existence of entrepreneurship, innovative activities, institutional structure and rate of prosperity, the condition and presence of infrastructure, and finally accessibility and availability of financial, social and human capital (Audretsch and Keilbach 2004; Naudé et al. 2008; and Cornett 2009).

As indicated in the Figure 3.2, the factors of regional economic development directly or indirectly related to the entrepreneurial activities such as innovation, welfare, human capital, and infrastructure. In this respect, entrepreneurship is considered as the crucial actor of regional development processes.

In this respect, Karlsson and Dahlberg (2003) describe several reasons underlying selection process of the region as an activity area by entrepreneurs and small firms as follows: First, the region allows the occurrence of social capital. Also, the boundaries of a region as the geographic platform facilitate to access social capital. Secondly, regions include knowledge. The Knowledge Spillover Theory argues that regions are the main source of the knowledge (Acs and Armington, 2006). Although the dissemination of knowledge takes place between companies and individuals, such regional dissemination has localization tendency so that geographic proximity facilitates to access and benefit from knowledge. Emerged as an organizational structure, small-firms linkages, clusters and networks endeavour to take advantage of this proximity. Finally, the last reason is introduced by New Economic Geographic Theory (Fujita, Krugman and Venables, 1999) which draws attention to the essential four points that are self-reinforcing growth or decline, external and internal scale economies, geographic transaction costs and market potentials which enables new perspective on cluster formation, firm growth and entrepreneurship.

Figure 3.2: Regional Development Model



Source: Müller, 2011

Roles of Entrepreneurs in Regional Economic Development Process

Entrepreneurship plays a vital role in regional economic development process. Since the 1970 crisis, large firms have begun to lose their weight in the economy, whereas the importance and the share of the small firms and entrepreneurship have started to increase. Particularly, as indicated previously, because of its contribution to regional economic development, entrepreneurship has gained vital importance both in growth theories and regional development policies.

In this vein, Baumol (1968) argues that approaches¹⁵ trying to explain economic growth only with labour force expansions and capital accumulation have led to the emergence of much ambiguity (i.e., the source of technology in the neo-classical growth models remained unexplained) in growth theories, but by adding entrepreneurship in growth theory this ambiguity have disappeared. In this direction, the traditional production function has been expanded by Audretsch and Keilbach (2004) with the inclusion of entrepreneurial capital. In addition, Leff (1979) notes that entrepreneurship is one of the most important driving forces of the economic development so that it sometimes has been accepted as the ‘fourth’ element of the production function.

Depending on its role in the economy/market entrepreneurship has been identified in various ways and thus emerged as a multi-dimensional concept. For example, Leibenstein (1968) attracts attention the following four roles of entrepreneurs: entrepreneurs can easily create connection between diverse markets, they have the ability to eliminate market deficiencies (as gap filler), they provide new inputs into the market (as input completer), and finally they expand and create time-binding/input-transforming entities. Entrepreneurs also have the following characteristics: they lead to new inventions and innovations (Schumpeter, 1934), cause the formation of new markets (Carree and Thurik (2005), ensure the dissemination of knowledge (Acs et al., 2005), create employment (Fischer and Nijkamp, 2009), and thus, they stimulate and contribute to regions to economically develop. In addition, Porter (1998) supposes that through entrepreneurial activity, the number of new firms raise that lead to increased competition and thus improvements of quality and productivity within regions.

¹⁵ Neo-classical growth theories.

In addition, from a dynamic perspective, the entrepreneur is a crucial actor of technological change and he/she also can mediate to the creation, implication and dissemination process of new ideas (Audretsch and Keilbach, 2004b). In this sense, Acs et al. (2005) suggest that entrepreneurs primarily provide the spill over of knowledge, then allow the transformation of general knowledge into economically valuable knowledge and finally, pave the way for using it in the economic production process. He also argues that entrepreneurs, contributing to regional economic development, may serve as a conduit for the dissemination of knowledge in the context of endogenous growth theory. Accordingly, to achieve all these, the entrepreneur is a person who has to take risks, use resources effectively, and exploit opportunities in the market (OECD, 1998).

Furthermore, according to evolutionary economics perspective, selection and diversity are two essential elements of regional economic changes (Nelson and Winter, 1982). Diversity is manifested as a natural outcome of the entrepreneurial activities which provide regional economic development through the exploitation and selection of new business opportunities recognized by present knowledge. Given that different economic agents have different knowledge and experience (Shane, 2000), so that each of them can benefit from the existing knowledge in different ways. In this sense, when an agent recognizes a new economically valuable knowledge and decides to benefit from it via a new initiative, he or she affects economic development in a positive way by obtaining value from this knowledge (Acs, et al., 2009). Therefore, entrepreneurship has been recognized as a mechanism of economic diversity and a tool converting general knowledge to economically valuable knowledge (Audretsch and Keilbach, 2004a).

After the 1980s, the importance of the innovative activities of entrepreneurs began to increase in the context of regional competitiveness. Obviously, there is a strong relationship between entrepreneurship and regional competitiveness which are depicted as two sides of the same medal (Nijkamp, 2009). The concept of entrepreneurial competition was firstly introduced by Marshall a century ago and then, the contribution of entrepreneurship in economic development was primarily recognized and analyzed by Schumpeter (1934). He determines the entrepreneur as the practitioner of creative destruction, an innovator, a creator and source of inspiration. Thus, through the

innovative activities of entrepreneurs, as mentioned above, they may contribute to economic growth in different ways. Thus, in order to ensure high economic performance in a competitive economy entrepreneurship and innovation are seen as major driving forces (Suarez-Villa, 1996; Acs 2002). In other words, Nijkamp (2009) argues that the vitality, flexibility, and competitiveness of a region's economic system are a *sine qua non* for the capability to (resilience) stand against economic crisis.

Entrepreneurs also play the crucial roles in the reduction of unemployment that is an important way to enable regional economic development. The vast majority of studies on entrepreneurship and regional productivity growth have found a positive relationship between entrepreneurship and regional employment growth (Karlsson, 2012). Therefore, policymakers have paid more attention to the effects of entrepreneurship on regional employment growth than the other issues. Lately, researchers have begun to spending great efforts to examine the relations with entrepreneurship and employment. The existing research results indicate that the effects of entrepreneurship on regional employment growth vary in time and across regions or countries. However, despite all this, the majority of studies found a positive relationship between them (Klette and Mathiasen, 1996; Ashcroft and Love, 1996; Acs and Armington, 2004). Therefore, entrepreneurship is regarded as key factor to eliminate inequality between regions and to solve the unemployment problem.

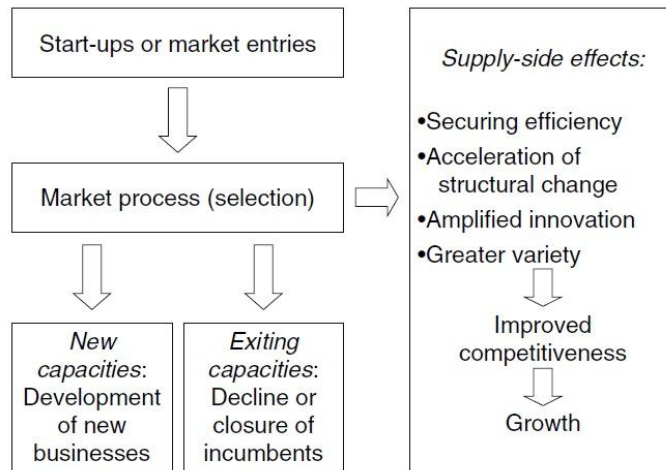
To sum up, after the 1970s crisis the importance given entrepreneurship and its role in regional economic development has substantially increased among researchers and policy-makers. While, at the first, the impact of entrepreneurship on employment has been highlighted, later, besides this, its effect on innovation, competitiveness, creation and dissemination of knowledge has been emphasized.

3.2.1.3. The Contributions of Entrepreneurship on Regional Economic Development

The relationship between entrepreneurship and regional economic development is multi-dimensional (Fritsch and Mueller, 2004; van Stel and Suddle, 2008; Fritsch, 2008; and Fritsch and Schroeter, 2011). Entrepreneurship affects regional economic development both directly and indirectly. The **direct** (or short-term effects) contribution of the entrepreneurship is found in the evolution of the newcomers which create new capacities in the market (i.e. their share in the market and the number of employees). However, because of the extreme competition and market selection, only a small part of the newly established firms continue their activities and survive for a long time and even, some of them may displace incumbents in the market (Fritsch and Weyh 2006). For this reason, with the entry of new businesses into the market two types of exit may happen (result in job losses and closures) (Fritsch, 2008 and 2011). Firstly, since a large number of new firms failing to be adequately competitive, they have to exit in the market after a while. Secondly, the crowding-out of existing firms by new competitive firms cause diminishing market share or market exit. In this line, because of the increasing market share of new entrants such crowding-out effects may take places in the output market. In addition, with the participation of new businesses the demand for resources will raise that lead to high factor prices and shortages of inputs and then crowding-out effects may occur. These are labelled (negative) indirect effects of the entrepreneurship on regional economic development (Fritsch and Mueller, 2004). Briefly, while competitive and productive firms remain in the market, the non-productive firms either shrink or leave the market. Though establishing new firms crates additional capacities which need employees to start production, the effect of new business formation on employment generation is not always positive but may be negative.

However, new businesses explore and develop different ways of competition in the long-term which leads to employment generation and promotes competitiveness on the supply side of the market (Figure 3.3). In this respect Fritsch and Mueller (2004), Fritsch (2008, 2011), and Fritsch and Schroeter (2011) describe four types of (positive) **indirect** supply-side effects:

Figure 3.3: Direct and Indirect Effects of Entrepreneurship on Regional Economic Development



Source: Fritsch, 2008, 2011

- **Securing Efficiency:** Due to competition in the market resulting from new entrants, productivity efficiency will increase within the market. In addition, Baumol et al (1988) argue that, not only current entries, but also the possibility of other firms' entry compels the incumbents to produce more efficiently.
- **Acceleration of structural change:** In general, structural change takes place mainly with a turnover of relevant economic unit (i.e. with the participation of new businesses which displace the established firms). In this instance, resident companies do not make internal changes, but are replaced by new firms. This process has been explained by the Schumpeterian creative-destruction concept.
- **Amplified innovation:** It enables the emergence of new markets. New firms are the pioneer and creator of many radical innovations in the market (Acs and Audretsch 1990; Audretsch 1995; Baumol 2004). In other words, if a person wants to establish his/her own business, he or she may come up with new ideas to the market that stimulate and increase innovation (Audretsch 1995). The main underlying reason of new firms' radical innovative activities is that instead of doing research for new opportunities, incumbents spend the majority of their efforts to obtain more profit (Geroski, 1995).

- **Greater variety of products and problem solution:** If the new entrants introduce new process innovation and have different product program from the incumbents, these provide increased various problem-solving methods and product diversity. Increasing products variety facilitates costumers work to find easily their needs and preferences. In addition, increased variety enables new business opportunities which mean new employment, increase in innovation and regional economic development (Saviotti and Pyka, 2004; Boschma, 2004).

These effects are indirect effect of the entrepreneurial activities that improve the supply-side of the market. All these effects do not necessarily occur in the industry where entrepreneurs begin activities, but also can emerge in other industries which have input or output relation with this industry. In addition, these effects do not need to be limited to a region where new businesses occur, but also they can take place in other region. These supply-side effects of entrepreneurship are the vehicle of regional knowledge stock, innovation and competitiveness that ensure regional employment and economic growth. In short, these are the answer of the question how does entrepreneurship contribute to regional economic development (Fritsch (2008, 2011).

The study on the different effects of new business formation or entrepreneurship on the market clearly shows that the entry of new firms into the market is only a small fraction of their total effect on regional economic development. However, the most important influence of the entrants on employment and economic growth emerges indirectly on the supply-side of the market. Furthermore, Fritsch (2008,2011) supposes that the new business formation's direct employment effects starts to decline in a short time, so economic and employment growth can only be expected from indirect effects of the entrepreneurship.

Entrepreneurship and Employment

Birch's (1981) question “who creates jobs?” has led to the emergence of an intense and long-lasting debate on the relationship between entrepreneurship and employment generation among numerous researchers and policy-makers. Through this debate, the impacts of small and new firms on economic growth and employment have begun to attract attentions. Especially, in the last three decades with the passing of the innovative

advantage from established large enterprises to new and small firms that result from technological progresses reducing the significance of economies of scale, the roles of entrepreneurship and small firms have increased in economic development (van Stel and Suddle, 2007). Since the seminal work of Birch (1987) who argues that small and medium sized enterprises are important vehicles for creating new jobs, the interest in SMEs and entrepreneurship has gradually increase. There are many studies showing that small firms play crucial role in generation new employment, have emerged to support Birch's claim (Reynolds, 1994, 1999; Spletzer, 2000; Carree and Thurik, 2003; Neumark, Zhang and Wall 2006).

Within this framework, many studies on the effects of entrepreneurship on employment growth demonstrate that as the rates of entrepreneurship or self-employment increase in a region, the rates of unemployment decrease (Santarelli, Carree and Verheul, 2009; Monsen, Mahagaonkar and Dienes, 2012). In other words, entrepreneurship affects unemployment in the long run. When creative destruction occurs, resulting in displacement of large and established firms, new products, innovations and knowledge spillovers may lead to an increase in economic growth and the number of new firms which means new demand for labour that causes a reduction in unemployment. In addition, Acs and Storey (2004) point out that an increase in the formation of new firms in a region stimulate economic growth, increasing rate of employment. The reduction experienced in unemployment has been referred to as the "Schumpeterian effect" (Thurik, 2003; Baptista and Thurik, 2007) or the "entrepreneurial effect" (Thurik et al., 2008; Gohmann and Fernandez 2014).

Furthermore, Fritsch and Mueller (2004) argue that due to higher competition (e.g., new firm formation causes more firm exit) the effect of entrepreneurship on unemployment can be negative in the short-term, but in the long-term increased competition leads to economic growth and affect employment positively. As a result, it could be argued that there is a negative relationship between entrepreneurship and unemployment. Namely, due to creating new ventures and reducing unemployment entrepreneurs have been recognized as the key drivers of regional economic development in this context.

In that sense, entrepreneurship, as a source of (regional) economic development and creation of new jobs, has been widely accepted as a new solution against unemployment problem in a variety of countries. Therefore, in the entrepreneurship policy the priority has been given to the increase in number of new firms (i.e., as an instrument of active labour market policy) in almost all countries (Lundstöm and Stevenson, 2005; Audretsch, Keilbach, and Lehmann 2006; Fritsch and Schroeter, 2011).

However, the truth is not valid for all regions and time. While the long-term effect of new business formation or entrepreneurship on some regions is positive, the effect can be negative for short and medium term (Mueller, van Stel, and Storey, 2008). In addition, recent research has indicated that there are also some regions¹⁶ that have relatively high growth rates of entrepreneurial activities, but at the same time have negative employment generation and below average growth rate (Audretsch, Keilbach, and Lehmann 2006; Bosma, Stam, and Schutjens, 2010; Fritsch and Schroeter, 2011).

The cyclical impacts of entrepreneurship on employment: Direct and indirect effects

Entrepreneurship by definition generates new businesses which mean a new demand for labour markets. Through the formation of new businesses additional capacities will be generated in the market and thus new employment opportunities will arise for individuals. However the contribution of entrepreneurship on regional employment does not occur immediately, according to Fritsch and Mueller (2004) and Mueller et al. (2007) it is separated over a relatively long period of time, usually 10 years (Baptista and Preto, 2011). In this respect, the contribution of entrepreneurship manifests itself in three different ways that directly and indirectly (See Figure 3.4) (Acs and Mueller, 2008; van Stel and Suddle, 2008; Fritsch and Noseleit, 2012, 2013).

Due to requiring extra staffs to run the additional capacities in the market new firms result in an increase in employment in the long-term (Fritsch and Schroeter, 2009). However, according to Fritsch and Mueller (2004) the contributions of entrepreneurship on regional employment growth vary over time and follow a specific temporal pattern. Fritsch and Mueller (2004) developed a three-stage model to show the temporal effect of

¹⁶ See further explanation in the section ‘Why Do the Effects of Entrepreneurship on Regional Economic Development Differ across Regions?’

new firms on regional employment development. Initially, new business formations have a direct effect on regional employment generation (phase I). The new establishments provide employment, at least to founder (Karlsson, 2012). Furthermore, supposing that at least part of the founders of the new firms previously worked as the wage-employment in other firms, the positions occupied by them will be filled by unemployed individuals and thus entrepreneurship generates a direct positive employment effect.

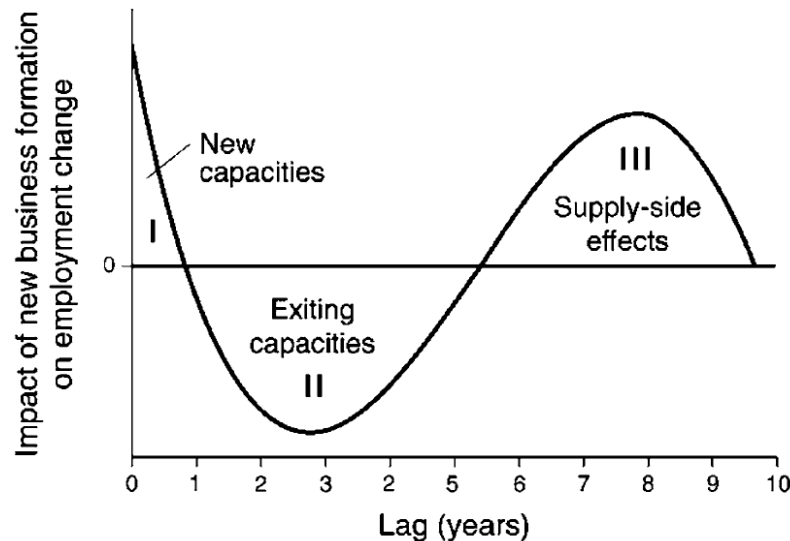
However, after the initial stage, the contribution of entrepreneurship may become negative on regional employment. In particular, the competition between new establishments and incumbents on input and output markets causes market selection (Fritsch and Schroeter, 2009). Fritsch and Mueller (2004) put forward that if the market selection process runs within the framework of a ‘survival of the fittest scenario’, firms with relatively low productive are forced to reduce their level of economic activity or must exit the market (this can be explained by the Schumpeterian creative destruction process or displacement effect). Although productivity of firms increases in this type of scenario, output remains at a constant level and thus employment falls (phase II). Therefore, even though establishing new firms implies additional capacities that need extra personnel to run them, the impact of new firms on the regional employment does not have to be positive but can also be negative (Fritsch and Noseleit, 2013).

In the last stage (the second indirect effect of new firms) due to additional competition by new firms, the supply-side of the economy¹⁷ will improve and thus economic productivity and competitiveness of regions will increase. Therefore the supply-side improvements lead to the emergence of additional employment in the long-term (phase III). Hence, Fritsch and Mueller (2004) suggest that the supply-side effects are the main reason why someone might expects positive employment from the establishment of new firms. Furthermore, because of these effects both existing firms and new firms have to increase their productivity to survive. For these reasons and with the possibility of displacement effects new firms may induce employment of incumbents in a region. All

¹⁷ The supply-side effects of entrepreneurship on regional economic development are as follows: increased efficiency in the existing firms, accelerated structural change through displacement effects of efficient new firms, amplified innovation, and greater variety of products and problem solution (Fritsch and Mueller 2004; Fritsch 2008, 2011; Fritsch and Schroeter 2011)

these indirect effects generate new employment opportunities in different sectors in a region so that unemployment falls.

Figure 3.4: The effects of new business formation on regional employment change



Source: Fritsch and Mueller, 2004; Koster, 2011; Fritsch and Noseleit, 2013

The contribution of entrepreneurship on regional employment growth over time has been illustrated in Figure 3.4. As shown in the figure the overall effect of entrepreneurship on regional employment is positive that leads to the conclusion that the formation of new firms stimulates the creation of employment. There are a variety of empirical studies explore and uncover the indirect effects of new firm formations on employment. For example, Fritsch and Mueller (2004), Fritsch and Schroeter (2009) and Fritsch and Noseleit (2012) for Germany; Acs and Mueller (2008) for US; Baptista et al. (2008) and Baptista and Preto (2011) for Portugal; van Stel and Storey (2004) and Mueller et al. (2008) for UK, Arauzo Carod et al. (2008) for Spain; and van Stel and Suddle (2008) for the Netherlands. All these studies clearly demonstrate that the indirect contribution of entrepreneurship can be more important than the direct contribution. In addition, the evidence clearly shows that in order to evaluate and to obtain better results, a long-term analysis is crucial for the relationship between new business formation and employment creation (Koster, 2011; Karlsson, 2012).

Entrepreneurship and Innovation

It is widely acknowledged that entrepreneurs are the main source of change and innovation that stimulates economic competitiveness and productivity improvements.

The main determinants of regional economic development are still a very hot topic of discussion among regional scientists. The researchers have conducted many studies to explore and understand the main factors of economic growth and development. In this context, growth theorists like Grossman and Helpman (1991) assume that the improvements in the technology are the primary source of the economic development because technological development is necessary to boost the efficiency of resource (Williams and McGuire, 2010). Thus, regional prosperity may be seen as a consequence of the improvements of productivity and innovations. In other words, innovations are the primary drivers of improvements of productivity and technological progress that enable regional development. As Porter (1990) indicated that if a country or region aims to ensure economic development, its firms have to be more productive which is provided by the development of more sophisticated sources of competitiveness based on innovation, insight, investment and knowledge. Therefore, to ensure regional economic development someone is needed to provide technological progresses. In this respect, this sub-section deals with the relationship between entrepreneurship, innovation and regional economic development.

Apart from innovation and technological advancements, the creation and dissemination of new knowledge and ideas are also significant factors for accelerating changes in economic system and economic growth. The majority of literature puts forward that the spillover of knowledge resulting from entrepreneurship and innovation does not only contribute to regions economic growth, but also to the competitiveness of firms (van Oort and Bosma, 2013). Therefore, in the continuation of this sub-topic the nexus between entrepreneurship, knowledge spillover and regional economic development and competitiveness will be discussed.

The importance of innovation for regional economic development

Innovation¹⁸ is as old as humankind, but economists and researchers have generally ignored and only indirectly referred it until a century ago. However, with the contribution of Schumpeter (1934) the importance given to innovation has substantially increased in the recent times because innovations has led to changes (i.e. people's behaviour, work, and labour methods), shaping the history of mankind. In addition, with the recent economic growth theories, the role of innovation has been clearly recognized.

In this framework, Schumpeter (1934) identified innovation as an engine for economic development in the early 20th century, and also Martin and Sunley (1998) argue that innovation is crucial for new growth theory. In similar direction, Drucker (1998) points out that innovation facilitates the creation, implementation and dissemination of new knowledge, technologies and products. This may create an environment where organizations and firms are being in systematically mutual interaction (Cooke et al., 1998). Also, Cooke (2004) argues that such environments where innovative activities are dense are the main source of regional competitiveness. In this regard, according to the approaches (i.e. "innovative milieu" (Aydalot, 1986; Maillat and Lecoq, 1992; Maillat, 1995, 1996, 1998; Crevoisier, 2004), localized "flexible specialization and production systems" (Glasmeier, 1991; Saxenian, 1991; Robertson and Langlois, 1995; Markusen, 1996, 1999), a "(new) industrial district" (Piore and Sabel, 1984), and "regional innovation system" (Cooke and Morgan, 1998; Cooke, et al. 1997)) those aim to explore the main source of regional competitiveness assume that innovation is the main driver of entrepreneurial activities and endogenous regional economic development (Baumgartner, Pütz and Seidl, 2013).

¹⁸ **Innovation:** Innovation is "the successful implementation of creative ideas" (Amabile 1996, p. 1, in Williams and McGuire, 2010). In addition, West and Farr (1989) describe it as the arrangements made to improve productivity and performance in a society, an organization, or in a job. According to Tushman and O'Reilly (1997) innovation means new solutions in marketing, production, technology and other processes and is the way to gain competitive advantage for regions and organizations. According to Porter (1990) innovation is the solutions developed against potential threats and have significant effects on the industry sector and firms' revenue as well as on the regional prosperity. The product or process created within the application process of a new idea generates innovation (Galbraith, 1982), but it does not matter where this idea came from. Thus, in order to make innovation, the creative ideas having economic value have to be produced, noticed, and implemented.

Although innovation and entrepreneurship are different matters, the two generally have been connected to each other with very close ties. In this context, Schumpeter (1934) divides the economic development process into three clearly distinct phases. In the first phase new ways of doing things or technical discovery of new things takes place that implies invention¹⁹. In the next phase innovation happens which means the commercialization of a new products or ideas result from technological studies. The final phase is described as the adoption and diffusion of new processes and products to market that refers to imitation. Schumpeter also clearly differentiates the role of innovator and inventor in the economy.

Furthermore, Schumpeter (1934), probably more than any other scholars, clearly expresses the role of entrepreneurship in economic development (Braunerhjelm, 2010). In his seminal work, *The Theory of Economic Development*, Schumpeter (1911/1934) emphasizes the importance of the entrepreneur in economy. Schumpeter argues that since economic processes are organic, changes are inherent in the economic system (Chen, 2014). Furthermore, he points out that the entrepreneur is one of the most important actors in the economic change because, the changes in the economy result from the innovative activities of entrepreneurs and also, these innovations are introduced by entrepreneurs into the market. In addition, innovative activities of entrepreneurs generate a creative-destruction process by leading disturbance in an economy at equilibrium, and offering new opportunities for agents in economy (Wong, Ho and Autio, 2005). Therefore, entrepreneurs are of vital importance for changes in economic system through disseminating and transforming new knowledge into economic processes and daily business activities (Acs and Armington, 2006). In this way,

¹⁹ **Invention:** Fagerberg (2006) has defined **invention** and innovation in different ways. According to Fagerberg (2006, p. 4-5) invention is the first emergence of an idea for a new process or product, whereas innovation is the first step of the implementation of it. As Fagerberg notes that it is very difficult to distinguish these two concepts from one another. However, Fagerberg (2006) describes the main difference between invention and innovation as follows: while invention might happen in anywhere, the latter takes place generally in firms which contains a combination of different types of qualities, skills, resources, knowledge and capabilities. For example, von Braun (1997) describes an innovation model in four main stages: generation of knowledge (basic research), technology (applied research), invention (experimental research), and innovation (including production and sales) (Williams and McGuire, 2010). In this regard, there have to be an entrepreneur in Schumpeter's term, or an innovator to conducts all of these tasks (Galindo and Méndez, 2014).

Schumpeter assumes that the greater numbers of entrepreneurs in a region facilitate regional economic development.

To sum up, innovation and capacity to innovate are pivotal actors for regional economic development. As indicated by Cornett (2009), regional economic development is not manna from heaven or an independent case, but more or less consists of the local firms' efforts to generate revenue. Therefore, the mechanisms that stimulate innovative behaviour of firms and the factors promoting economic growth have gained importance in the context of large and small firms. In this perspective, the role of entrepreneurship in terms of knowledge spillover and innovations becomes key driver for regional economic development.

Knowledge Spillover Theory of Entrepreneurship

In addition to technological changes or innovations, entrepreneurs are closely associated with flexibility and knowledge which have drawn attention as the source of competitiveness in global world economy (Sanyang and Huang, 2010). In this respect, the role of entrepreneurship in the creation and dissemination of knowledge, which is an essential factor for regional economic development and competitiveness, will be addressed here.

Since the 1900s economists have been searching the role of knowledge for a long time in economic development theories. Marshall (1920) postulates knowledge as one of the crucial actors for industrial clustering. Arrow (1962) describes new knowledge as an outcome of the learning by doing, and Audretsch (1995) indicating knowledge which may fall as manna from heaven. In addition, the knowledge production function (KPF) (Grilliches, 1979; Jaffe, 1986, 1989; Klarl, 2013) supposes that both universities and private R&D activities is the main source of knowledge and innovation that ensure the growth of new firms (Stam and Wennberg, 2009; Qian, Acs and Stough, 2013). Later, the argument of KPF has been extended by endogenous growth theory (Romer, 1986, 1990), differently from neo classical growth model, considering technological developments in the economic growth equation as endogenously. The theory (Romer

1986; Lucas, 1988) puts forward that the generation or/and accumulation of knowledge is an essential factor for creating economic growth in a region.

However, endogenous growth theory and knowledge production function approach that aware of the significance of knowledge spillover for economic growth and innovation, and suppose knowledge spillover may emerge automatically, cannot fully explain the issue of dissemination of knowledge in economic growth process (Acs et al., 2009). In addition, they have failed to recognize the difference between economically useful knowledge and new knowledge. As Michelacci (2002) and Braunerhjelm et al. (2010) argue that if knowledge production or R&D is not economically valuable, they do not contribute to innovation and economic development. In this line, to close this gap Audretsch (1995), Acs et al. (2004, 2009), Audretsch and Lehmann (2005), Audretsch et al. (2006), Audretsch and Keilbach (2007), Braunerhjelm et al. (2010) and Audretsch et al. (2012) have developed **Knowledge Spillover Theory of Entrepreneurship (KSTE)**.

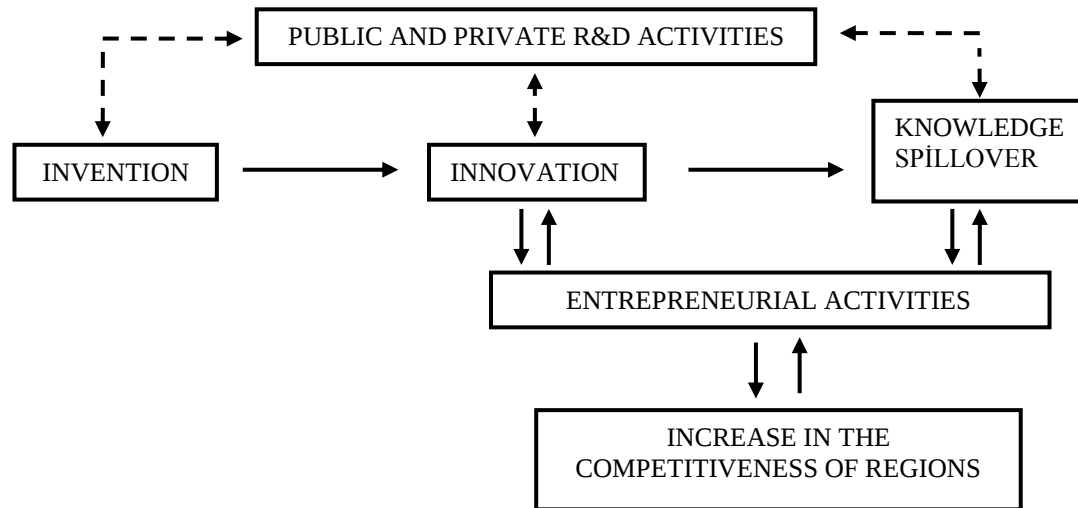
The main argument of this theory is that entrepreneurs commercialize new knowledge generated by the large firms (Audretsch and Belitski, 2013). According to the Knowledge Spillover Theory of Entrepreneurship (KSTE), the entrepreneur is a conduit of transmitting knowledge spillover and each new knowledge means new opportunities for entrepreneurs (Qian, Acs and Stough, 2013). Therefore, a lack of entrepreneurship can result in low returns of knowledge and thus less economic growth (Audretsch and Lehmann 2005; Fritsch 2008). In this respect, the theory suggests two main ideas: firstly, knowledge is one of the most important sources of the entrepreneurial opportunities and secondly, the evolution of such opportunities by entrepreneurs results in the formation of new firms (Acs and Qian, 2013). In addition, Florida (2004) emphasized the role of regions equipped with talented people and new ideas as globally competitive centres. According to him, such regions, because of the availability of tolerance, diversity and cultural amenities, produce important solutions about business and become attraction center for creative people. Thus, the rate of innovative activities, spillover of new knowledge and entrepreneurial activities is high in these ‘creative’ regions.

New knowledge, generated through private and public sector R&D activities especially by the private sector R&D, carried out by large incumbent firms (Audretsch, Bönte and Keilbach, 2008). However, due to a variety reasons, these firms do not willing or able to benefit from these new knowledge. In this case, innovative entrepreneurs recognize this new knowledge and take advantage from this gap as a new business opportunity. In this sense, it is expected that the number of knowledge based entrepreneurs is high in location with higher amount of knowledge. Furthermore, according to Audretsch et al. (2008) knowledge spillovers tend to be geographically localized and that geographical proximity facilitates the access and utilization of knowledge spillovers. Although developments in information and communication technology make easier the spread of codified knowledge, Lawson and Lorenz (1999) argue that face-to-face contact is the essential vehicle in transferring of tacit knowledge. Due to face-to-face contact requires geographical proximity; probably, the expansion of tacit knowledge occurs only in a certain area (namely it is geographically localized) (Audretsch and Feldman 1996). Therefore, it is expected that there are greater levels of innovative (knowledge based) entrepreneurial activities (start-ups in high tech industry) in regions with higher amount of new knowledge (innovations). This is the essence of the KSTE (Audretsch, Keilbach, and Lehmann, 2006).

The knowledge spillover theory of entrepreneurship establishes an important bond between entrepreneurship and knowledge. It explicitly suggests that the generation of new knowledge which means new opportunities for entrepreneurship, is a crucial factor of regional economic development. Nonetheless, it is now widely accepted that new knowledge creation is not only determinants of economic development, but also the willingness and the ability of innovative entrepreneurs to develop new process and products based on new knowledge are the other important determinants (Audretsch et al., 2006, 2008). In addition, the spillover of new knowledge, generated through both private and public R&D, stimulates knowledge based entrepreneurs leading to the creation of high-tech companies. In this perspective, Geroski (1995) asserts that the growth and survival of new firms depend on their capacity to exploit new knowledge. In other words, taking advantages effectively of this knowledge is vitally important for

regions' economic development and competitiveness (Audretsch and Keilbach, 2006; Acs et al., 2009).

Figure 3.5: Entrepreneurship and Innovation



Source: Author's elaboration

To sum up, the (regional) economic growth was defined in neoclassical economy by Solow (1956) as the accumulation of capital and labour (L) together with technology which is exogenously given. However, the endogenous growth theory (Romer, 1986; Lucas, 1988) argues that (regional) economic growth is the result of endogenous factors which are the investments in knowledge, innovation and human capital. New knowledge is consisted of education (Uzawa, 1965) and innovation (Arrow, 1962b) and is a consequence of interactive learning process (Audretsch, Hülsbeck and Lehmann, 2012). In other words, new knowledge occurs in the combination of human capital with existing knowledge (H*A). Innovation is created by employing labour (L) to existing knowledge (L*A). Lastly, output (Y) is generated by joining existing technology (K) in the above-mentioned factor:

$$Y = (H*A)^{\alpha} * (L*A)^{\beta} * K^{\eta}$$

In this perspective, innovation and dissemination of new knowledge have been accepted as the important factors of economic development. Nonetheless, there is a need for a vehicle to ensure the transformation of these factors into economically valuable things. Thus, the regional economic growth and competitiveness depend on the innovative activities of entrepreneurs that act as a conduit of transmitting of knowledge spillovers

and as an innovator. By pioneering innovative activities in regions and providing new business opportunities, entrepreneurs contribute to the establishment new firms and generation of new employment. In addition, entrepreneurs contribute regional development through ensuring commercialization of new knowledge generated by incumbent firms. Accordingly, Audretsch et al. (2008) argue that the innovative activities in a region stimulate regional knowledge-based entrepreneurial activities, and thus result in regional economic development. In this line, the KSTE and entrepreneurship literature argue that a region with higher concentration of innovative activities and new knowledge will create more opportunities for entrepreneurs, whereas a region with a scarcities of skills and new ideas will create fewer opportunities for entrepreneurs (Audretsch, Bönte and Keilbach, 2008; Audretsch and Belitski, 2013; Acs and Qian, 2013). Thus, it is expected that regions with higher concentration of knowledge-based and innovative entrepreneurship may have higher economic growth rates.

3.2.1.4. Informal Entrepreneurship (Self-employment) and Regional Economic Development

Entrepreneurship generates new businesses, and new businesses by definition generate new jobs which increase productivity and intensify competition, and therefore may result in new innovations, employment opportunities and regional economic development. Hence, one supposes that there is a direct proportion between high level of entrepreneurship and high level of regional economic growth. However, this relation is more complicated in the reality. Examining the contribution of entrepreneurship on regional economic development, the majority of literature demonstrates that the relationship between entrepreneurship and regional economic development can be positive especially in developed regions, whereas the relation can be insignificant and even negative in developing and underdeveloped regions (Acs, 2006; Acs and Amorós, 2008; Stel and Suddle, 2008; Mueller, van Stel, and Storey, 2008; Fritsch and Mueller, 2008; Fritsch and Schroeter, 2009). In a similar vein, Wennekers et al. (2005) have found a U-shape relationship²⁰ between the two.

²⁰ You can see further explanation in the section of ‘Why Do the Effects of Entrepreneurship on Regional Economic Development Differ across Regions?’

Empirical analyses of the contribution of new firm formation have indicated that there are a variety of factors have affected the relationship between new firm formation (entrepreneurship) and regional economic development. According to Fritsch and Schroeter (2010), a negative or positive effect of new firm formation on regional economic development may be due to different types of entrepreneurship and the economic development stage/level of regions or countries²¹. In this line, they argue that if the market selection process does not work according to a ‘survival of the fittest’ scenario, the firms with relatively higher productivity will be forced to reduce their output or exit in the market while those with relatively low productivity will remain in the market. The overall economic performance and competitiveness of the region will decline and thus result in negative supply-side effects. Namely, they are supposed that a firm's ability to compete and survive depends on its quality. Thus, the contribution of new business formation on regional economic development varies depending on its quality. For example, the entrance of innovative enterprises managed by well qualified entrepreneurs equipped with the necessary knowledge and skills can be expected to have larger supply-side improvements and stronger effect on regional economic development than the entrance of non-innovative enterprises operated by person who has not enough skills and knowledge (Fritsch and Schroeter, 2009).

In this line, when reviewing the effect of entrepreneurship and new firm formation on regional economic development, Baumol (1990) also argues that different forms of entrepreneurship and new firm formation have different effect on (regional) economic development. Baumol determines the following types of entrepreneurship: in the one hand, productive entrepreneurship which involves the exploitation of profit opportunities in the market. It is innovative and has ability to turn knowledge into economically valuable things. On the other hand, unproductive entrepreneurship which is particularly widespread in the informal sector is a new firm formation that aims to survive in a state of unemployment and poverty. Moreover, a distinction similar to Baumol has been made by Global Entrepreneurship Monitor (GEM) (Ligthelm, 2013). The GEM divides entrepreneurs into two categories. First, opportunity entrepreneurs

²¹ You can see further explanation in the section of ‘Why Do the Effects of Entrepreneurship on Regional Economic Development Differ across Regions?’

(who can also be defined as formal, quality, innovative and productive entrepreneurs), having the skills and abilities to recognize the business opportunities in the market. Secondly, necessity entrepreneurs who are closely related to informal sector (that can also be defined as unproductive and non-quality entrepreneurs) are involved in entrepreneurial activities due to lacking other options. In this vein, Schneider and Klinglmair (2004) points out that this type of entrepreneurship (necessity-driven or informal self-employment) holds the majority of economic activities in developing countries and societies. For this reason, it could also be expected that different types of entrepreneurship has different impact on regional economic development.

Like the above classification, after 1970s several researchers have discovered new types of entrepreneurship as formal and informal entrepreneurship. While the former has similar characteristics with ‘opportunity’ and ‘productive’ entrepreneurship, the latter looks like ‘necessity’ and ‘unproductive’ entrepreneurship. In the one hand, it is widely acknowledge that entrepreneurship, regardless whether it takes place in the field of registered (formal) economy or occurs within informal economy which outside state regulatory system (Thurik et al., 2002; Carree and Thurik, 2010), is one of the crucial factors for regional economic development (Baumol, 1968). On the other hand, Williams and Nadin (2010) argue that the effect of formal and informal entrepreneurship is quite different and both take place and agglomerate in regions or countries with different characteristics. For example, while formal entrepreneurship conducts its tasks and concentrates in a region that have good institutions, quality governance and high level of economic development, informal entrepreneurship prefers to a region having weak institutions and governance and low level of economic development.

The studies regarding informal self-employment and its effects on regional economic development are in a small number. However, Thai and Turkina (2014) argue that although the importance referring to entrepreneurship in the informal economy is less, there are various important reasons why it cannot be overlooked. Firstly, Schneider et al. (2010) assert that informal commercial activities constitute over thirty percent of all economic activities carried out around the world. Secondly, regardless of their economic development level, informal entrepreneurship (self-employment) may take places in all countries or regions (Thai and Turkina, 2012, 2014). Thirdly, informal self-employment

is dominant generally in developing regions those with weak institutional system. For instance, Williams and Round (2007) point out that 90% of Ukraine's new firms realise their activities partially or entirely in the informal economy. Lastly, the informal economy paves the way for the formation of unethical behaviour and practices such as natural environmental abuse, worker exploitation, corruption, bribe, tax evasion, etc. In addition, Loayza (1996) puts forward that the existence of large informal sector is one of the key features of developing countries and regions.

For all these reasons, it is crucial to explore the effects of informal self-employment on the regional economic development. In this sub-section we aim to elucidate the character of informal self-employment and shed light on the nexus between informal self-employment and regional economic development.

The nexus between informal self-employment and regional economic development

In recent years the relationship between entrepreneurship, unemployment, development and poverty reduction has gradually attract attention. In particular, the outcomes of the empirical studies regarding 'growth and poverty' demonstrate that the identification of the types and sectors of the employment is an essential vehicle for converting growth into efficient poverty production (Islam 2004; Osmani 2005; OECD 2006; Lundström and Ronnås 2006). Thus, the contribution of different sector on regional economic development is important. In this context, informal entrepreneurship and its effects on regional economic development has emerged as a central area of inquiry in this part.

It is widely acknowledge that informal self-employment specifically clustered in low-income communities (Williams, 2008). This claim is reinforced by the survey findings in the subsequent study of Williams (2009). For example, he finds that in terms of gross household income, 30 percent of the informal entrepreneurs clustered in the lowest quartile of households in Russia , 34 percent in England and 35 percent in Ukraine. However, Williams mentions that this does not mean informal self-employment come from only the lower-income groups in the population. They can also be found in the highest-income groups. However, there are variations in these two different types of informal entrepreneurship. Informal entrepreneurs who concentrated in the highest income quartile of household operate formal enterprises but carry out a part of their

trade informally, whereas those who clustered in the lowest income households operate their all activities in informal sector (Williams, 2009).

Briefly, the vast majority of literature agrees that informal sector and self-employment has a strong relationship with poverty. In this respect, the potential contribution of informal (or unproductive and necessity) self-employment on regional economic development and employment generation is largely discussed in recent years. In this line, Berner, Gomez and Knorrinda (2008) summarized the general opinion in the literature as follows. They argue that the main purpose or motivation of the informal/unproductive/necessity entrepreneurship is not economic growth but survival. In this sense, because of serving as a buffer against deepening poverty and desperation the contribution of informal entrepreneurship on regional economic growth is marginal. In similar direction, Schramm (2004) affirms that the study and policy that aim to support these types of entrepreneurship are generally not successful. Also, according to Banerjee and Duflo (2011) most of the informal enterprises are set up to escape poverty and for survival. They also put forward that individuals forced to informal entrepreneurship do not have to be risk-taker, innovative, talented and skilful which are necessary to convert informal enterprises into successful businesses.

In addition to these, Thai and Turkina (2014) assets that the quality of governance (i.e., lack of legal barriers, democracy index, and governance index) and economic opportunities (i.e., including financial capital, innovation, GDP growth) are considered as the key factors that discourage informal entrepreneurship, but stimulate formal entrepreneurship. They also posit that researches based self-employment in the formal economy have found that technological development, high level of economic growth and good institutional structures are positively correlated with the share of (innovative and productive) entrepreneurship. However, studies with a focus on entrepreneurship in the informal sector have ascertained that countries with a large share of informal entrepreneurship and its commercial activities have stagnated or negative economic growth. Furthermore, similar to Wennekers et al. (2005), Thai and Turkina (2014) have found a U-shape relationship between the share of entrepreneurship and regional economic growth in terms of formal and informal entrepreneurship. As the economy is at the low stage of economic development the number of entrepreneurship is high but

with a large share of informal self-employment. On the other hand, when the economy starts to grow and reaches at the middle stage of economic development the cost of entry declines and thus the number of informal entrepreneurship reduces. However, in the final stage where the economy arrives at an developed stage, the share of formal entrepreneurship increase and thus enhance both economic growth and entrepreneurship rates of regions and countries.

To conclude that informal entrepreneurship is most often clustered in regions or countries with low level of economic development, low technological advancement, weak governance and institutions, and high burden costs. All these strongly support the institutional economic literature by reaffirming that the elimination of legal and regulatory challenges leads to formal entrepreneurship and thus results in regional economic development. These insights also confirm the arguments of economic development literature which suppose that economic development causes an increase in the individuals' abilities and resources. Namely, with the increase of individuals' income new demands occurs that means new varieties of products and goods. Thus, new business opportunities take place in the market. In this case, new firms are usually emerged in the formal sectors. As a result, while regions with higher level of formal self-employment are more likely to have high level of economic development, regions with higher level of informal self-employment are more likely to have low level of economic development and employment generation.

3.2.2. Why Do the Effects of Entrepreneurship on Regional Economic Development Differ across Regions?

It is widely acknowledged that entrepreneurship is a key factor of national and regional economic development. Through creating new businesses which are the main source of innovative activities, entrepreneurs generate and maintain a new dynamic business environment with large market opportunities that are the stimuli of employment generation and economic growth (Audretsch and Keilbach, 2004; Baptista et al., 2008; Carree and Thurik, 2010). Hence, the capability to generate, recognize, act upon, evaluate, and commercialize these market opportunities has been accepted as an essential contribution of entrepreneurship on regional economic development (van der Zwan et al., 2013). For these reasons, the concept of entrepreneurship has received increasing attention by policy-makers and academics (Audretsch and Keilbach, 2007). Consequently, the central point of interest in the studies regarding entrepreneurship is to increase the formation of new businesses (Carree and Thurik, 2003; Lundström and Stevenson, 2005; Audretsch, Keilbach, and Lehmann, 2006). It is therefore understandable that numerous countries and regions determine the increasing number of start-ups as the main priority objective for themselves (Gries and Naudé, 2008).

However, Fritsch and Schroeter (2009) ask whether a high number of start-ups is really better than a low number of start-ups for economic development. In other words, is there a straightforward relationship between the number of new firms and regional economic growth? In line with this purpose, empirical studies conducted in recent years demonstrate that while new business formation creates a positive longer-term effect on economic development in some regions, such effect of new business formation on economic development can be negative in other regions (Audretsch and Fritsch, 2002). In addition, Mueller, van Stel, and Storey (2008) support this argument that there are some regions that have both relatively high numbers of new business formation and below average growth rates. For example, Schmiemann (2008) finds that the Baltic States and the Mediterranean economies in the EU are the countries with the largest SME sectors, but are not the countries with the highest GDP per capita. Moreover, in his study on Brazilian micro-regions, Cravo (2011) has indicated that there is a negative or insignificant relationship between the size of SME sector and regional economic growth.

In a similar vein, Bosma, Stam, and Schutjens (2010), and Fritsch and Schroeter (2009, 2010, 2011) show that the marginal employment effects of an increasing new business formation rate declines and even may become negative when this rate exceeds a certain threshold in some regions.

The literature briefly argues that the contribution of entrepreneurship to economic development is controversial and may differ over time and significantly among countries and even in regions of the same country (Reynolds et al., 1994; Carree et al., 2002; Acs and Armington, 2004; Wennekers et al., 2005; Stam, 2006; Gries and Naudé, 2008; Fritsch and Mueller, 2004, 2008; Acs and Mueller, 2008). Therefore, in recent years many scholars have attempted to determine the reasons of diverse effects of entrepreneurship on different regions and countries. In this respect, a large empirical literature has identified two main causes underlying this difference. The literature argues that the essential factors in occurrence of this variation are closely related to the types and/or characteristics of entrepreneurship and economic development stage of regions.

Firstly, it is argued that different types of entrepreneurship can have diverging effects on economic growth and employment generation. For example, while entrepreneurship which is labelled as productive, innovative, explorative, opportunity, and formal has substantial influences on regional economic growth and the creation of employment, entrepreneurship called unproductive, imitative, exploitative, necessity, and informal has insignificant or even negative impacts on regional economic development (Acs and Varga, 2005; Baumol et al., 2007; Fritsch and Schroeter, 2009). Secondly, the empirical evidences show that the contribution of entrepreneurship differs across the stage of economic development and there is a U-shaped relationship between the rate of entrepreneurship and the level of economic development (Sternberg and Wennekers, 2005). The so-called relationship displays a negative effect of entrepreneurial activity on economic growth and employment for developing countries but a positive effect for developed nations.

In other words, regions with low economic development level mostly have weak institutions and governance, low level of innovation, and thereby have a huge number of low quality of entrepreneurship with a slight effect on economic growth, whereas

regions with higher level of economic development have quality governance, good institution, high level of technological advancements and thus have a great number of innovative and high-quality entrepreneurship with significant positive effect on economic growth (van Stel et al., 2005; Fritsch and Schroeter, 2010). Hence it could be expected that there is a close relationship between the economic development level of regions and the types of entrepreneurship. Accordingly, in this sub-section we will try to understand and uncover the question why the effect of entrepreneurship varies across regions, based on the two main reasons mentioned above.

3.2.2.1. Different Types of Entrepreneurship and Economic Development

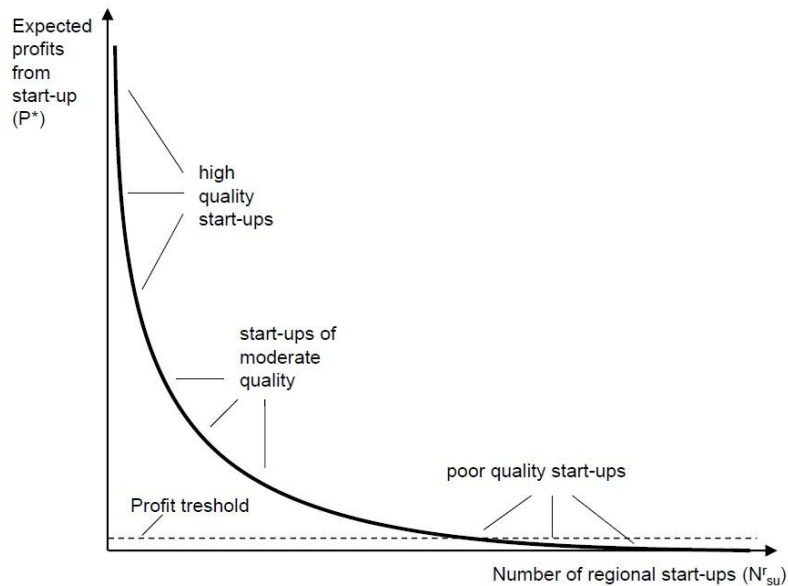
A large part of literature on the effect of market entry (entrepreneurship) has demonstrated that there are two main reasons of an overall negative effect and a declining marginal effect of new firm formation on regional economic development (Fritsch and Schroeter, 2009). The first reason underlying a negative employment effect of new firms is that the market selection process or competition does not work according to a ‘survival of the fittest’ scenario which means the firms with relatively higher productivity will be forced to reduce their output or exit in the market, whereas those with relatively low productivity will remain in the market (Fritsch and Schroeter, 2010). Hence, the competitiveness and the overall economic performance of the region will reduce, which leads to negative supply-side effects. In this vein, Fritsch and Mueller (2004) argue that public intervention can be a potential source of such a failure of the market mechanism. Non-productive firms can take advantage from the subsidies provided by government and thus the share of such firms may increase in the market, and that means a threat for the market equilibrium. Indeed, this situation explains why the marginal effect of new firm formation declines despite the increase in the rate of start-ups. Another reason of a negative or declining marginal effect of new business formation is based on start-ups which can result in overcrowding in the market, and that causes low economic growth and low prosperity (Fritsch and Schroeter, 2009). The overcrowding approach refers to the notion that there should be a certain number of firms or employees in a particular market that can continue their activities for a long time. In terms of the ecology literature, this implies that each market has a ‘carrying capacity’ (Carre and Thurik, 1999). Thus, when the number of firms exceeds a certain

threshold in a market, their long-term effect on employment remains more or less constant (Fritsch and Mueller, 2004). This argument is also supported by Audretsch et al. (2002) who explain that there is an equilibrium rate of self-employment in a market and if the rates of business ownership has reached or exceeded this rate, it will disturb market equilibrium and lead to reduced growth rates.

Accordingly, it could especially be expected that due to the market overcrowding and excessive entry, diverse costs may take place in the market. For example, Parker (2007) argues that the costs of creative destruction may result from overproduction that causes a decrease in the prices of outputs under their equilibrium level. From a different view point, Manove and Padilla (1999) indicate that excessive production bids up the demand for inputs and that may lead to increased prices of inputs. Therefore, the competition in the market may be destructive and results in reduced economic growth and welfare (Carree et al., 2002). As a result excessive entry and market overcrowding may cause relatively higher creative destruction costs in terms of adjustment costs of financial and labour markets, operation costs, and the sunk costs as well (see Fritsch and Schroeter, 2009 for detailed information).

Briefly, the existing economic literature argues that a negative or declining marginal effect of new firm formation on regional economic growth and employment may stem from market overcrowding that is caused by excessive entry. In this sense, Fritsch and Schroeter (2009, p.12) put forward that the market overcrowding argument is especially convenient to clarify the case of ‘why the marginal effect of new firm formation declines with an increase in the start-up rate’. They also point out that the argument is strongly associated with low-quality and non-innovative entrants that are lacking in competitiveness and have only a slight pressure on the established firms (Figure 3.6). On the contrary, they suggest that in case of innovative and high-quality start-ups, the carrying-capacity of the relevant market cannot easily be defined, and therefore, the overcrowding approach is not applicable. For this reason, a positive employment effect of new firm formation could be expected particularly if there is a high level of innovative and high-quality start-ups, or vice versa (Fritsch and Mueller, 2004; Fritsch and Noseleit, 2009; Fritsch and Schroeter, 2011).

Figure 3.6: Expected profits from a start-up and the number of start-ups

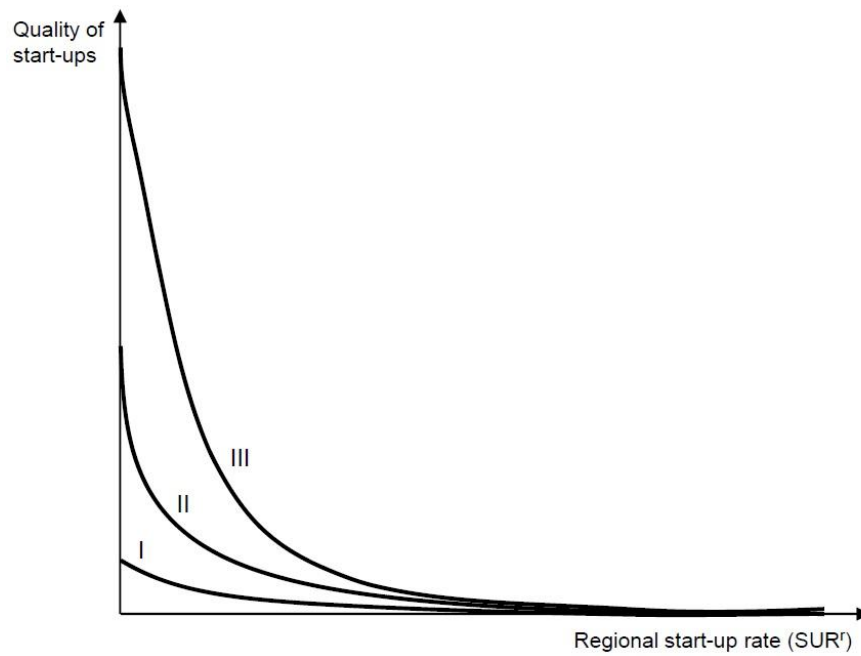


Source: Fritsch and Schroeter, 2009

As it is discussed previously and also in their seminal article “*Are More Start-Ups Really Better? Quantity and Quality of New Businesses and Their Effect on Regional Development*”, Fritsch and Schroeter (2009) argue that the quality²² of the start-ups can be an essential reason for regional differences in their effect on economic growth and employment. In this perspective, Fritsch and Schroeter (2009) demonstrate the relationship between the quality of start-ups and their marginal effect on regional economic development in Figure 3.7 and 3.8. They assume that while the number of high-quality start-ups is at the highest level in region III, it is at lowest level in region I, and at a moderate level in region II. Consequently, as compared to the other two regions, the growth effect of high-quality ventures is much more apparent in region III.

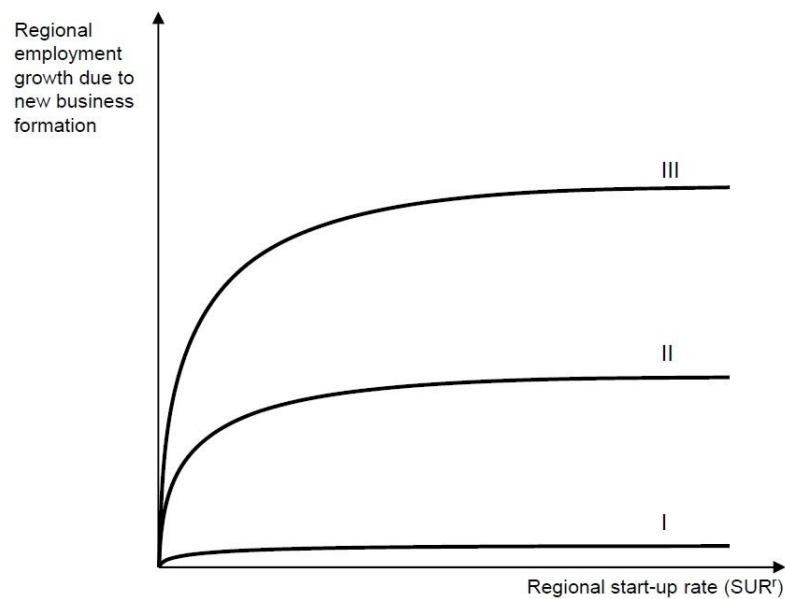
²² The quality of start-up refers to characteristics such as the efficiency of the firm, the competence of entrepreneur, the followed marketing strategies, innovation of the goods and services as well as the quantity and quality of resources mobilized for new businesses. All these features are essential for start-ups to be able to exert pressure on incumbents.

Figure 3.7: Regional differences in the high-quality of start-ups



Source: Fritsch and Schroeter, 2009

Figure 3.8: Regional differences in the effect of high-quality start-ups on economic growth



Source: Fritsch and Schroeter, 2009

Thus, it is plausible to suggest that the regional difference in the effect of entrepreneurship on regional economic growth takes place due to the quality of start-ups. Hence, it could be expected that innovative and high-quality entry of new firms may have substantially positive effects on regional economic development and employment, whereas non-innovative and non-quality ventures have insignificant or even negative effects. In a similar line, Fritsch and Noseleit (2013) say that since high-quality start-ups may be better able to grow, to survive and to challenge incumbents, they have a more pronounced direct effect and higher indirect effects in the market. For example, in an analysis for Portugal, Baptista and Preto (2011) find that start-ups in knowledge-intensive and in innovative sectors have a greater effect on regional employment, especially greater indirect effects. In addition, in an empirical study of Germany, Fritsch and Schroeter (2011) affirm that new firms in the knowledge-intensive service industries have a stronger overall effect on regional economic development. Consequently, the quality of start-ups can be one of the important determinants of regional differences in the effect of start-ups on economic development and employment.

Similar to above arguments, the researchers in the Global Entrepreneurship Monitor (GEM²³) project have found varying effects of entrepreneurship on economic development and employment across countries. For example, they have observed that while countries like Ecuador, Peru and Uganda have a higher level of self-employment with a low level of GDP per capita, countries like Germany, Sweden and Japan have a lower level of self-employment with a higher level of GDP per capita. This situation leads the researchers to focus on the notion of why the contribution of entrepreneurship on economic development and employment differs across countries. In this respect, to explore and understand the notion, GEM researchers have divided entrepreneurship into two different types because they thought that different entrepreneurship have varied effects on (regional) economic development.

²³ The Global Entrepreneurship Monitor (GEM) as a project annually evaluates the individuals' attitudes, aspirations and entrepreneurial activities in a wide range of countries. The GEM is founded in 1999 as a partnership between Babson College and London Business School, which initially includes only 10 countries but now the number of countries exceed 100. According to the GEM, they cover nearly 75 per cent of world population and nearly 90 per cent of world GDP (www.gemconsortium.org).

In this respect, GEM identifies “necessity entrepreneurship” where individuals set up new firms due to having unsatisfactory or non-existent work options, and in order to escape from unemployment (Reynolds et al., 1995; Acs, 2006; Acs et al., 2008). Individuals consider entrepreneurship as their last resort (Valliere and Peterson, 2009). It is therefore postulated that because of having fewer business skills, hiring fewer employees and making lower investments, necessity-driven entrepreneurs have low effects on countries or regions’ economic development (Baltar and Icart, 2013). In addition, Acs et al. (2008) put forward that the relationship between economic development and necessity entrepreneurship is most probably negative in low-income countries. On the other hand, “opportunity entrepreneurship” is recognized as an activity emerged through the capability of individuals in perceiving and taking advantage of new business opportunities in the market (Shane and Venkataraman, 2000; Shane and Eckhardt, 2003; Casson, 2003; Parker, 2004; Sternberg and Wennekers, 2005; Acs, 2006). In other words, opportunity-driven entrepreneurs set up new firms to exploit a profitable business opportunity even if they have several options of salaried jobs (Acs et al., 2008). Unlike the necessity-driven entrepreneurs, opportunity-driven entrepreneurs due to perceiving new knowledge, creating innovation strategies, hiring more employees and making additional investments to expand their businesses have a positive effect on countries or regions’ economic development especially in modern economies (Baltar and Icart, 2013).

Due to having varied effect on economic development and employment the distinction between necessity and opportunity entrepreneurship is significant. Several researchers (i.e., Baumol, 1990; Wennekers and Thurik, 1999; Armington and Acs, 2002; Acs and Varga, 2005; Acs, 2006; etc.) have demonstrated that there is a negative nexus between necessity-driven entrepreneurship and economic development, yet a positive association with opportunity-driven entrepreneurship. As indicated by Sternberg and Wennekers (2005), ‘U-shape’ feature also displays the relationship between the rates of necessity/opportunity-driven entrepreneurship and a country’s level of economic development. In this context, Acs (2006) points out that the rate of these type of entrepreneurship is an important indicator of the countries or regions’ level of economic development. For example, a study conducted by Acs and Varga (2005) reveals that the

contribution of necessity and opportunity entrepreneurship on economic growth and employment is significantly different. While opportunity entrepreneurship has significantly positive impact on economic development, necessity entrepreneurship has no effect. This argument is supported by GEM (2008) as reporting that necessity entrepreneurship is more common in low-income countries and regions. GEM also supposes that when a region experiences an economic growth/development, the rates of necessity entrepreneurship start to decline there. In a similar direction, Gries and Naude' (2010) have found that through the provision of intermediate services/inputs and innovative activities, opportunity entrepreneurship can lead to a structural transformation from labour-intensive and non-productive traditional sectors to innovative and knowledge-based sectors. Consequently, one may infer from these arguments that the contribution of entrepreneurship may vary depending on different types of entrepreneurship.

Apart from the above classifications, considering their impact on economic development, Baumol (1990) also determines two types of entrepreneurship (i.e., productive and unproductive). According to Baumol productive entrepreneurs are the individuals who are able to exploit the business opportunities in the market and are those who can commercialize new knowledge. However, unproductive entrepreneurs are those who struggle to survive and have less effect on economic development. Additionally, Baumol puts forward that due to having different supply of productive and unproductive entrepreneurship, the overall contribution of the entrepreneurship on economic development varies greatly across countries. In this line, the researcher asserts that the institutional and economic structure of a country plays a crucial role on the allocation of entrepreneurship in productive or unproductive activities. Baumol with his own words argues that the rules of the game which describe the reward system in the economy determine the allocation of entrepreneurial activity (Sautet, 2011). In other words, while regions with good institution/governance, economic development and technological advancements have higher number of productive entrepreneurship, regions without these features have higher number of unproductive entrepreneurship. Consequently, Baumol expresses that there is a strong relationship between the prosperity of an economy and the degrees that productive entrepreneurship is rewarded in that economy. In addition,

he argues that entrepreneurial activities are often pent up in countries with low economic growth so that unproductive entrepreneurship generally emerges in these countries. Hence, Cravo (2010) and Cravo et al. (2012) express that policy-makers should attach importance to the issue of allocation of entrepreneurship with the provision of good institutional regulations that encourage entrepreneurs to start productive activities.

In addition to the above, Breschi and Lissoni (2001) divide entrepreneurship into two types: exploitive and explorative. They point out that exploitive entrepreneurs have a strong association with current activities and practices and they participate in imitative activities of existing business ideas (Schmitz, 1989). Karlsson (2012) argues that although exploitive entrepreneurship plays an important role in knowledge spillover process, they have little contribution on economic development and have little growth potential because the products that they launch to the market already exist in many markets. In other words, because of the fact that such entrepreneurs do not bring innovation, new products or organization methods, and new marketing strategies, they provide little or no contribution to the emergence of new sectors in the market. Conversely, explorative entrepreneurs are eager to put into practice new business ideas and always highlight newness (i.e., technological advancements, new products and marketing strategies, etc.). Accordingly, explorative entrepreneurs lead to the emergence of new sectors which enable diversified markets, and that provide economic development.

To sum up, in recent years many researchers have tried to solve the ‘issue’ of why the effects of entrepreneurship vary across regions. According to the majority of the empirical studies of these researchers, there are two main reasons for this difference: types of entrepreneurship and economic development stage of regions. In this part of the section, the first reason has been examined. In this respect, depending on their contribution to regional economic development, researchers have separated entrepreneurship into different types. Roughly, according to literature, entrepreneurship which is knowledge-based, innovative, formal, and is initiated by qualified persons have more contributions to the economic development of regions than the other initiatives which are non-innovative, non-productive, necessity-driven, and informal.

3.2.2.2. Regions at Different Stage of Economic Development

An entrenched regional inequality is one of the most important facts of the world economy. For example, while the gross regional product (GRP) per capita is at the highest level in some regions, it may be at the lowest level in other regions in the same country. In this context, many researchers based on entrepreneurship literature have argued that the effect of entrepreneurial activity in terms of gross regional product (GRP) may differ in line with the economic development stage of regions (Wennekers et al., 2005; Acs, Desai and Hessels, 2008). Because it is recognized that economic development stage is an important indicator of the regional economic development situation, and thus inequalities in economic development could be a crucial explanatory factors of the regional difference in the effect of entrepreneurship on regions (Li and Zhao, 2011). According to van Stel et al. (2005) and Stam and van Stel (2009), the effect of entrepreneurial activity on economic development is negative or insignificant in the regions at the initial stages of development, but it is positive in the regions at the advanced stages of development. Hence, it is crucial to understand how the impacts of entrepreneurial activity could vary in accordance with the economic development level of regions.

Economic development concepts, as mentioned in the previous section, can be defined in several ways. It is widely acknowledged that the operational notion of economic development implies a structural change or transformation (Syrquin, 1988 in Wennekers et al., 2005). The sectoral shift in economic activities (employment, production, consumption) and accumulation of human and physical capital are considered as the fundamental components of this transformation. The transformation in terms of socio-economic changes also includes some other components such as an increase in education level, demographic transitions, changes in income distribution and urbanization. However, because regions or countries have different economic development level, a new approach emerged in the 1960s separated economic development into different stages by highlighting discontinuities of economic development. A well-known representative of this tradition is Rostow (1960) who distinguished economic development of countries into five different stages such as the traditional society, the preconditions for take-off, take off, the drive to maturity, and the

age of high mass consumption. However, the basic assumption of Rostow's theory did not include some countries' economic development process so that it has been criticized in many aspects. For this reason, in recent years, Porter (1990) and Porter et al. (2002), depending on their level of GDP per capita and of competitiveness, has offered a new classification of countries' economic development. In addition, many scholars such as Audretsch et al. (2002), Wennekers et al. (2005), Acs and Amoró's (2008), Acs, Desai and Hessels (2008), Bosma et al. (2009), Wennekers et al. (2010), Li and Zhao (2011), and Casero et. al. (2013) have used this classification to uncover the regional or country difference in the effect of entrepreneurship on economic development at the different economic development stages.

In this sense, Porter (1990) and Porter et al. (2002) determine competitiveness based on economic development of a country into three specific stages: the factor-driven, efficiency-driven and the innovation-driven. In addition, they determine two transitions between these stages.

(1) Factor- driven stage: countries in this stage of development specialize in the production of small-scale manufacturing and agricultural products. In other words, the economic development level of these countries is at the lowest level and their production is based on the movement of basic factors of production including unskilled labour, natural resources, and land. Since such countries do not have a good institutional structure and enough opportunities in the formal sectors, large numbers of people resort to self-employment which is mainly necessity-driven and informal. Therefore, the rates of self-employment in developing countries are found relatively higher. In this respect, Wennekers et al. (2005, 2010) assert that competitiveness of a country, which is at the factor-driven stage, essentially depends on the low factor costs and the existence of minerals and/or other products.

(2) Efficiency-driven stage: to move its economy from the first stage to the efficiency-driven stage, a country has to take advantage of technologies in its industrial production process. In a similar direction, Acs and Amoró's (2008) point out that to keep pace with the subsequent technological advancements countries have to increase their number of educated labour force and efficiency in production.

Audretsch et al. (2002) indicate that a country economy is based on manufacturing sector rather than agricultural production, and thus economic growth is more capital intensive. Furthermore, competitiveness of a country, at the efficiency-driven stage, is based upon efficient production practices on wide markets that enable firms to benefit from economies of scale. In short, the key factors allowing a transition from the first stage to the second stage are the accumulation of capital and the diffusion and changes of technology. Therefore, at this stage, while the rates of large firms tend to increase, the rates of self-employment begin to decrease. In this line, Acs, Desai and Hessel (2008) determine several reasons of why the rates of entrepreneurial activities decline in a country despite it experiences economic growth. First, when a country begins to prosper the real wages will increase, the opportunity costs of starting a new business will raise, and thus the returns of wage-workers will be higher than self-employment. Similarly, Carree et al. (2002) put forward that the increased opportunity costs lead to an increase in the number of salary/wage employees. Second, when economies of scales are considered as the main source of the productivity in the markets, small firms lose their competitive advantages (Li and Zhao, 2011). Finally, Noorderhaven et al. (2003) argue that the greater use of capital encourages firms to grow in size and causes the emergence of employment opportunities in the formal sectors.

(3) Innovation-driven stage: it is argued that countries in this stage have to be the pioneers of technological developments around the world. In a similar direction, Porter et al. (2002) assert that to move into the innovation-driven stage countries have to do innovation on a global scale in at least some sectors. In other words, the transition to this stage necessitates countries to improve their capability to create and commercialize new knowledge. In addition, Wennekers et al., (2005, 2010) find that countries at this stage have significant potentials like skills, technology, knowledge and purchasing power, and therefore they can make innovations that can achieve increasing return to scale. Briefly, as an economy move into this stage it will be more friendly and favourable for small firms and thus the rate of self-employment tends to increase. In other words, technological advancements may reduce the opportunity costs of starting a new business and can eliminate the advantages of

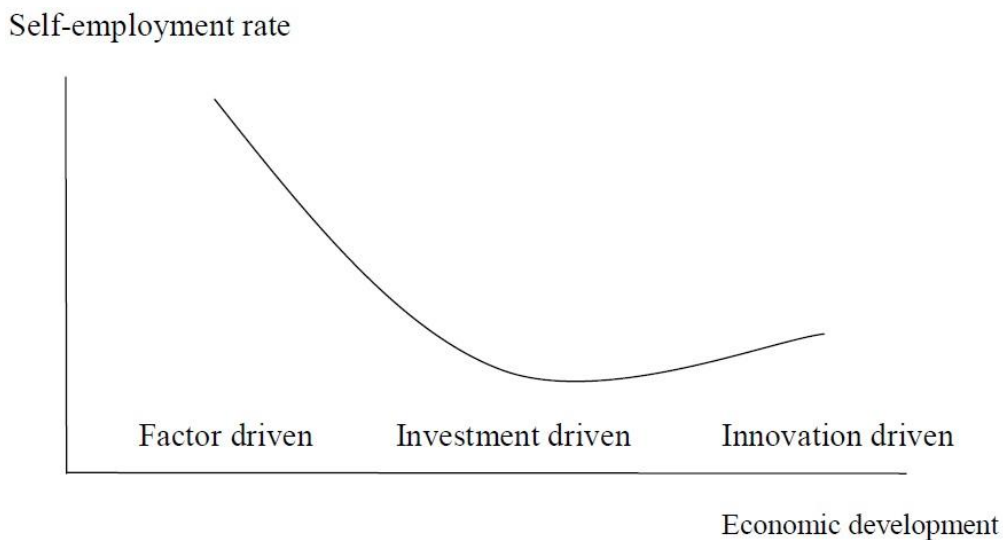
economies of scale, and that provides the necessary conditions for small businesses (Li and Zhao, 2011). Therefore, the innovation-driven stage associates with the increase in the entrepreneurial activities. Audretsch and Thurik (2001, 2004) argue that countries in the innovation-driven stage are more closely linked to “entrepreneurial economies”, whereas countries in the efficiency-driven stage are more closely associated with “managed economies”.

According to literature some reasons of the increased rates of entrepreneurial activity in the final stage have described as follows: First, since the 1970s a decline in manufacturing has been observed almost all industrialized market economies. In this case, the share of service sector in a market increases more than the share of manufacturing sector. Because the size of service companies is relatively smaller than manufacturing firms, the average firm size in the markets becomes smaller. In this respect, Acs, Desai and Hessels (2008) assume that the service sector is more suitable for entrepreneurial activities, and therefore the innovation-driven stage is marked with high rates of (innovative and knowledge-based) self-employment. Second, the improvements in the technology are another reason of entrepreneurial activities rise in the final stage. Particularly, in recent years, advancements in information and telecommunication technology (ICT) have been the key point in the increase in entrepreneurial activity. For example, the internet, mobile phone service, computers, photocopying services, mail services and the others technological developments strengthen communication between individuals, and thereby provide time saving and the reduction of costs. Hence, all these lead to an increase in entrepreneurial activity in economies at the innovation-driven stage.

Accordingly, the above arguments imply that the relationship between the rate of self-employment and economic development is negative during the industrialization process, or in the initial and second stages of economic development, whereas the relationship becomes positive in the post-industrialization era, or in the final stage of economic development, as shown in Figure 3.9 (Li and Zhao, 2011). In this line, Chandler (1990) indicates that in a large part of the 20th century, as the period of economies of scale, the rate of self-employment declined in most industrialized countries, and therefore it is highly probable to find the rate of self-employment is relatively higher in developing

countries than in developed countries. In this respect, recently most empirical studies confirm that the contribution of entrepreneurship on economic development varies across countries or regions due to the differences in the economic development level. For example, van Stel et al. (2005) demonstrate that in terms of entrepreneurial activities there are strong differences between countries. This variation is strongly associated with differences in countries economic development levels. Similarly, Blanchflower (2000) assumes that these differences are related to the stages of economic development as well as institutional, cultural and demographic characteristics of countries.

Figure 3.9: Economic Development Stages and Self-employment Rate



Source: Li and Zhao, 2011

In addition, Wennekers and Thurik (1999) have supposed that there is a U-shaped relationship between the rate of entrepreneurial activity and the stages of economic development. After this assumption most of researchers have sought to a U-shaped relationship between the rate of entrepreneurship and the economic development level of countries or regions. The implication of the U-shape (as indicated in Figure 3.9) is that at the initial stage of economic development countries have numerous (non-innovative and unqualified) self-employment, but as economies begin to develop,

implied to move into efficiency-driven stage, the rate of self-employment declines, yet wage-employment attracts people, and lastly when economies reached final stage the rate of (innovative and knowledge-based) self-employment picks up again. According the U-shaped relationship, the aggregate rates of self-employment in the factor-driven stage are relatively higher than in the innovation-driven stage. A study conducted by Carree et al. (2005) also reaffirms the implication of U-shaped relationship for OECD countries. An important paper by Wennekers et al. (2005) analysed the GEM data on the rate of nascent entrepreneurship and stages of economic development also found a U-shaped relationship. In addition, in a study conducted on OECD countries Acs (2006) has detected a U-shaped relationship for 15 out of 23 countries during 1970s or 1980s. Furthermore, Fritsch and Mueller (2008) show that the effect of entrepreneurship on employment is more pronounced and, especially, positive in high-productivity regions than low-productivity regions. In a similar manner, the GEM Report shows that the rate of adult populations participating in early-stages of business creation activities is higher in countries with a low GDP per capita, as compared with countries with middle- or high GDP per capita. Hence, it is observed that especially in recent years a U-shaped relationship between level of economic development and the rate of entrepreneurship has been widely accepted. Therefore, it could be expected that entrepreneurial activities are negatively related to economic development in economies in the initial or middle stage of economic development, the efficiency-driven stage, and thus most people will try to move from self-employment to wage-employment (Freitag and Thurik, 2007). Conversely, the relationship between entrepreneurial activities and economic development most probably becomes positive in developed economies, the innovation-driven stage, and thus most people switch from wage-employment to self-employment.

As a result, all these show that the types/roles/characteristics of entrepreneurship and the stages of economic development are the two important facts for explaining the varying effects of entrepreneurship on economic development, both in regional and national level. While the link between entrepreneurial activities and economic development is positive in modern economies, the same relationship has not been determined for emerging economies. This could be explained by the notion of (types of) entrepreneurship and (stages of) economic development is strongly interrelated. For

example, individuals in the initial or middle stages of economic development that refers to emerging and developing economies characterized by the weak institutions and less technological development, are pushed into entrepreneurial activities due to having unsatisfactory or non-existent work options, and in order to escape from unemployment. Hence, it could be expected that due to low level of economic development the contribution of these kinds of entrepreneurship, as labelled non-innovative, unproductive, necessity-driven, and informal, is limited. As indicated here the quality of entrepreneurship in less developed economies is lower and thus its effect is negative or insignificant. On the other hand, individuals in the final stage of economic development, or in modern economies which have high level of innovative activities, good institutional, economic and cultural structures and technological advancements, start new businesses to exploit profitable business opportunities in the markets. Thus, due to perceiving new knowledge, creating innovation, hiring more employees and making additional investments to expand their businesses, such entrepreneurship has a positive effect on countries or regions' economic development. This type of entrepreneurship is attributed as follows: productive, innovative, knowledge-based, or opportunity-driven entrepreneurship.

Consequently, although entrepreneurship has been widely recognized as the key driver of economic growth and competitiveness for regions or countries —namely, it can help regions or countries to shift from “managed economies” towards “entrepreneurial economies”— there is evidence that depending on different types of entrepreneurship and stages of economic development, the contribution of entrepreneurship on economic development varies not only among countries at different stages of economic development, but also among regions of the same country (Carree et al., 2002; Audretsch and Keilbach, 2004; van Stel et al., 2005; Audretsch, Keilbach, and Lehmann, 2006; Carree et al., 2007).

3.2.3. The Impact of Certain Regional Characteristics on Regional Entrepreneurship

Since the major contribution of Schumpeter (1950), entrepreneurship has been recognized as an important topic in the economic development/growth theories and practices (Lee et al., 2004). It is now widely accepted that entrepreneurship or new business formations by generating new employment, innovation and welfare effects are the crucial mechanism for economic development both at regional and national level (Acs and Audretsch 1988; Wennekers and Thurik 1999; Baumol 2002; Acs et al., 2008). For this reason, to ensure economic development central and local governments in a variety of countries support and encourage the formation of new business (Knoben et al., 2011). However, researchers indicate that entrepreneurial activities and entrepreneurship rates are substantially differ across countries and even between regions in the same countries. In a similar direction, van Stel et al. (2005) point out that although some countries and regions have similar levels of income, the formations of new business in these areas show great differences. Therefore, in recent years the importance given to the factors having effect on entrepreneurial activity has gradually increased.

In this respect, besides regions' economic development level (as mentioned in the previous section), studies regarding entrepreneurship have revealed many determinants influencing regional entrepreneurship. In this direction, Lee, Florida, and Acs (2004) have divided the studies conducted on the factors affecting entrepreneurship or new firm formation into two main categories (Acs and Megyesi, 2009). The first category which is more traditional tries to answer the question why a person decides to become an entrepreneur and start a new company. The studies in this category try to explain regional entrepreneurship depending on individual characteristics such as ethnic origin, age, gender, education level, perceived barriers to start a new business, attitudes towards risk, and work experiences (Storey, 1994; Audretsch et al., 2002; Lee et al., 2004; van der Zwan et al., 2013; Kibler, 2013). The second, regional level, category focuses on regional variation in new business formation by examining the structural differences in the geographical areas. In this category, studies have attempted to explain the regional variation in new business formation by looking into regional characteristics, including population growth/density, human capital, R&D expenditure, income and wealth level,

availability of financial capital, tax rates, unemployment, industrial clustering, levels of immigration and new firm formation rates (Reynolds et al., 1995; Reynolds, Storey, and Westhead, 1994; Saxenian, 1999; Kirchhoff et al., 2002; Armington and Acs, 2002).

In another study, Kibler (2013) examines regional factors that have effect on individuals' decision to be entrepreneurs and to start new businesses in a region in five dimensions: (1) demographic dimension including education (Armington and Acs, 2002) and population density (Naude' et al. 2008; Bosma, van Stel, and Suddle, 2008), (2) economic dimension containing wealth and income level (Reynolds, Storey, and Westhead, 1994; Mueller, 2006), (3) structural dimension that involves public and private sector employment (Lundström and Stevenson, 2005) and industry structure (Tamasy, 2006; Fritsch, Brixey, and Falck, 2006), (4) political dimension that comprises political ethos (Keeble and Walker, 1994; Reynolds, Storey, and Westhead, 1994; Spilling, 1996), and lastly (5) the dimension of entrepreneurial dynamism which includes entry and exit rates of entrepreneurship (Fritsch and Mueller, 2007; Audretsch and Fritsch, 2002; Audretsch and Keilbach, 2004).

Furthermore, Verheul et al. (2002) have classified the determinants of entrepreneurship in different ways such as according to the level of analysis or the distinction between demand and supply factors. According to the level of analysis, Verheul et al. (2002) describe the determinants of entrepreneurship at the micro, meso and macro level. Studies at the micro level aim to understand the factors (i.e., personal factors such as previous work experience, family background, financial assets, educational attainment and psychological traits) that promote or mitigate the decisions of individuals to be self-employment (Evans and Leighton, 1989b; De Wit and Van Winden, 1991; Van Praag, 1996; Blanchflower, 2000). Studies at the meso level focus on the market-specific determinants like opportunities for entry and exit and profit opportunities (Carree and Thurik, 1996; Carree, 1999). Lastly, studies at the macro level have interested in a number of environmental factors such as economic, cultural and technological variables and government regulation (OECD, 1998a; Noorderhaven et al., 1999; Carree et al., 2001). Finally, Verheul et al. (2002) deal with the determinants of entrepreneurship by making a distinction between the demand side (product market perspective; carrying capacity of the market) and the supply side (labour market approach) of

entrepreneurship. From the demand side the studies focused on the opportunities in the market which are crucial for starting a new business, and the current number of enterprises, related to the carrying capacity of existing and new markets (Sternberg and Wennekers, 2005). The presence of diverse demand in the market triggers the formation of new businesses. On the supply side, studies focus on the characteristics of the population and try to understand the likelihood impacts of these on a person's decision to become an entrepreneur. In this respect, unemployment, income levels, participation of women in the labour market, age structure, urbanization rates and population growth are the example given to these factors (Wennekers et al., 2010).

In this framework, this sub-section aims to explore the underlying reasons of regional differences in the level of entrepreneurial activity or in the new businesses formations. Depending on their characteristics and crucial roles in regional entrepreneurial activity, regional determinants have been divided into four different categories: (i) the resources of the region including population, education/human capital, financial capital, social capital and demographic composition; (ii) the economic structure of the region containing demand for new goods and services, clusters, networks, underexploited knowledge, and the employment structure of the region; (iii) the institutional structure of the region; and (iv) the cultural characteristic of the region comprising both regional and entrepreneurial culture. To sum up, this sub-section aims to understand the effect of certain regional characteristics on the numbers of regional entrepreneurship.

3.2.3.1. Resources of the regions

Population

Theoretical and empirical studies on economic geography have demonstrated that areas with dense population provide various economic advantages for existing and new firms (Florida, 2003; van Stel and Suddle, 2008). In this respect, Nijkamp (2009) and Kibler (2013) indicate that metropolitan and urban environments stimulate firm formation by supplying more convenient incubation conditions than rural, less dense areas. Cross-regional analysis conducted by Reynolds et al. (1994) and Armington and Acs (2002) also show a positive relationship between the rates of new firm formation and population density. In addition, Low et al. (2005) found that self-employed workers in

larger metro counties have higher average incomes, which reflects the advantages and better job opportunities of denser urban areas.

The literature based on agglomeration/urbanization economies points out several factors that may explain the higher levels of new firm formations in highly dense areas. In this context, due to advanced business infrastructure and market proximity, regions with high population density can support the growth of entrepreneurial activity (Brüderl and Preisdörfer, 1998). The presence of university and other research centres, generally located in urban areas, may provide easy access to innovations and technological developments, as well as an educated labour force (Verheul, 2002). In addition, Fritsch and Schroeter, (2009) put forwards that as compared to sparsely populated areas, high density regions provide more favourable conditions for the generation, utilization and dissemination of innovative opportunities, and thus have a higher share of start-ups. Moreover, Armington and Acs (2002), based on Marshall (1920) and Myrdal (1957), describes three causes of the emergence of agglomeration impacts in urban areas as follows. At first, due to the existence of a pooled labour market the firm birth rates are higher in these areas. Secondly, the presence of a great diversity of non-tradable special inputs and the lower transaction costs in such areas increase the rate of start-up activities. Thirdly, regions with dense population, which are characterized a close spatial proximity of different actors and a wide range of products, have a relatively high level of economic activities and innovative activities that generate the spillover of knowledge, which can lead to the recognition and creation of new entrepreneurial opportunities.

However, some empirical evidence indicates that due to fierce competition, high costs of entry and less room for innovative-driven differentiation in urban areas, new firms may have lower survival rates (Sorenson and Audia, 2000; Bosma, van Stel and Suddle, 2008; Fritsch and Mueller, 2008). Compared to less populated regions, highly populated regions hosts the larger domestic markets, which may lead to more intense competition both on the input and output markets (Fritsch and Noseleit, 2012). In other words, as previously explained, because of the market overcrowding and excessive entry in densely populated area, various costs may arise in the market such as a fall in the outputs prices and a rise in the inputs prices (Manove and Padilla, 1999; Parker, 2007; Fritsch and Schroeter, 2009). On the other hand, Meccheri and Pelloni, (2006) argue that

some rural regions with a relatively high concentration of agricultural activity consisting of small-scale enterprises can exhibit a high rates of entrepreneurship.

In light of these claims, it could be argued that population density may be positively associated with the rates of regional entrepreneurship. However, due to more intense competition both on the input and output markets this relation can be negative in agglomerations (Fritsch, 2011). Therefore, the relationship between population density and regional entrepreneurship can be positive and negative.

Demographic Composition

Age. According to the theoretical arguments and empirical studies, the relationship between age and regional entrepreneurship is rather complicated. In this sense, some researchers have argued that older people are more inclined to start a new entrepreneurial activity because it is highly-likely that they have more self-reliance, professional experience, speciality, social and professional networks, knowledge, and financial capital, facilitating the start new businesses (Arenius and Minniti, 2005; Levesque and Minniti, 2006; Hessels et al., 2008; Parker, 2009). On the other hand, other researchers indicate that because income from paid employment rise with age and the possibility of obtaining less revenue from self-employment, older people may avoid taking risks, and thus they may abstain from the idea of starting new ventures (Miller, 1984; Grilo and Irigoyen, 2006; Bergmann, 2011). In addition, Hessels et al. (2008) argue that since younger people are more energetic, enthusiastic and vigorous, they may be more open to new ideas and knowledge, which enables them to perceive and develop new business opportunities (in Álvarez-Herranz et al., 2011).

Within this framework, Bergmann (2011) has found an inverse ‘U-shaped’ relationship between age and entrepreneurial tendency. At first, entrepreneurial tendency rise with age, and roughly between the ages of 35 and 40 reaches its peak, and later starts to fall (Welter and Rosenblatt, 1998). However, Reynolds et al. (2003) have found a different result, which demonstrates persons between the ages of 25 and 34 are more likely to start a new business. Also, Storey (1994) found evidence that individuals between 25 and 40 years of age are more inclined to start a new business. Moreover, Evans and Leighton (1989a) indicate that most of the entrepreneurs begin a business in their mid-

thirties, and thus the average age of them is approximately 40 years old. Several empirical evidence also show that the probability of an individual to start a new business increases with age (Acs, Audretsch and Evans, 1994; Blanchflower, 2000).

As illustrated here, the relationship between age and the likelihood of starting a new venture is complex. However, the majority of literature shows that people generally establish new businesses in their thirties. Hence, it could be argued that regions with higher population between the ages of 20 and 40 have higher number of start-ups.

Gender. In recent years, the empirical literature on entrepreneurship shows that gender difference is another important determinant of regional variation in the rates of entrepreneurial activity. According to Brush (1992) while women and men show little differences in terms of psychological and demographic variables, they have more pronounced differences in business management styles and objectives. Similarly, the liberal feminist members argue that because there is not equal access to resources and opportunities, men and women may exhibit diverse behaviours (van der Zwan et al., 2013). Also, according to the social feminist perspective, due to having different habits/behaviours of socialization, men and women are naturally different (Fischer et al., 1993). Empirical studies on entrepreneurship have found that compared to women, men more frequently establish new firms, and have a higher probability of starting a new business (Sternberg, 2012). In other words, the possibility of setting up a new company for women is lower than men (Reynolds et al. 2002; van der Zwan et al., 2012).

In this respect, Bergmann (2011) points out that because of the more interruptions and part-time works in the women's working lives, women have lesser chance to gain the necessary experience and professional expertise for starting new ventures. Also, the choice of professional qualifications, traditional role models and academic studies are important factors affecting women entrepreneurial tendency (Carter, 1997).

In the context of entrepreneurial activity there is evidence that women exhibit a lower tendency for entrepreneurial activities (Grilo and Irigoyen, 2006; Blanchflower et al., 2001) and are more reluctant to launch a new company than men (Davidsson, 2006; Allen et al., 2008). The evidence provided by GEM (Global Entrepreneurship Monitor) also demonstrates that women are less likely than men to be nascent entrepreneurs (van

der Zwan, Verheul and Thurik, 2012). This is consistent with study by Reynolds et al. (2004), who concluded that as compared to women, the probability of men to be entrepreneurs is twice. According to the OECD report (1998b), generally, the self-employment rates of men in developed countries are higher than women's self-employment rates.

Within this framework, one can say that due to less financial capital, professional expertise and work experiences, difficulties in accessing loans and higher rates of discontinuity, women have lower intentions to start a new company than men. Therefore, it could be argued that the higher rates of women may negatively affect the rates of regional entrepreneurial activity.

Share of immigrants. According to the entrepreneurship literature, the impact of immigrants on the entrepreneurship level in a country or a region can be both directly and indirectly (Verheul et al., 2002). In this respect, initially, due to cultural and religious values immigrant families generally have more children and younger population, thus immigrants can indirectly influence the host country in terms of the age structure and population growth. Besides the indirect effects of immigrants, they can also affect national or regional entrepreneurship level directly (Bates, 1997; Borooah and Hart, 1999). As put forwarded by Verheul et al. (2002) the entrepreneurial propensity and skills of immigrants and native people can show important differences. In other words, as compared to native people, immigrants generally can take more risks, which is an essential feature of the entrepreneur (Knight, 1921), and therefore, it is considered that they have a more appropriate approach and mentality to launch a company. In addition, the reports by EIM/ENSR (The European Observatory for SMEs) (1993) has indicated that there are some factors, which are not important for indigenous population, can support and prevent the entrepreneurial activities of immigrants. Within this scope, Vivarelli (2013) asserts that by taking advantage of their minority community networks which is crucial to eliminate major problems encountered in the entrepreneurial process (i.e., difficulties in access to resource, technologies and financial capital, high transaction costs, and information asymmetries), ethnic minorities can obtain entrepreneurial advantages. Furthermore, several sociologists supposed that the common characteristics of ethnic minorities such as religion, culture and language

stimulate the formation of social cohesion, unity, solidarity and trust in these communities, which are the factors influencing entrepreneurial activity positively (Iyer and Schoar, 2010; Hobday, 1995; Greif, 1993). From a different point of view, due to adaptation difficulties in locals' language, culture, attitudes and behaviour, ethnic minorities are often pushed to the background in society, and also, have low participation rate in the labour market, in which they generally take part in informally and with low-wages (Verheul et al., 2002). Thus, all of these are important factors pushing immigrants into entrepreneurship to escape these backward positions.

In this respect, empirical evidence shows that immigrants (because of these specific factors) are more likely to become entrepreneurs than native people. For example, Goedhuys and Sleuwaegen (2000) indicate that compared to native people, non-African immigrants have higher tendency to become an entrepreneur in Cote d'Ivoire. In addition, an empirical study conducted by Goedhuys and Sleuwaegen (2010) demonstrates that firms owned by Asian immigrants in Sub-Sahara Africa exhibit better performance than indigenous companies and have positive and significant effect on economic growth. Similarly, Hewitt and Weild (1997) observed that Asian companies operating in Tanzania manufacturing sector can access more easily the existing technological resources and inputs, as compared to domestic companies. Consistently, Ramachandran and Shah (1999), in the study conducted for Zimbabwe, Zambia, Tanzania, and Kenya, have found that European and Asian immigrants' companies began greater and grow faster than African companies. Moreover, Mengistae (2001) observed that firms launched by immigrants in Ethiopia perform better than and grow faster than indigenous companies. Furthermore, Gülümser et al. (2009) also displayed that such immigrant entrepreneurs have contributed to regional economic growth through stimulating consumer spending, creating employment and generating diverse marketing activities, which also result in localized social capital.

In this framework, as indicated by Van den Tillaart and Poutsma (1998), because native entrepreneurs are generally reluctant to establish a business in areas with a high concentration of immigrants and do not sell foreign products, immigrants are forced to set-up their own businesses. Therefore, it can be expected that regions with higher level of immigrants can have higher level of start-up activity.

Education/Human Capital

The existing literature on education indicates that education may play a significant role on regional entrepreneurship. Similarly, van der Zwan et al. (2013) argue that education, by helping individuals to develop their abilities and to perceive new opportunities, may enable them to establish and manage a new business successfully, as well as to develop the existing business. In particular, because entrepreneurial ability can develop via education, it can encourage people to improve their entrepreneurial capabilities and approaches (Kuratko, 2005).

In a similar direction, Álvarez-Herranz et al. (2011) further show that individuals with higher education level are more apt to introduce innovations into the market, more skilled in establishing their own businesses and in perceiving new business opportunities (Arenius and de Clercq 2005; Oosterbeek et al. 2009), because as indicated by some scholars, personal qualities and professional skills obtained through training affect the success of entrepreneurs, and therefore, most entrepreneurs have a higher educational level (Naude et al., 2008). In a similar manner, Cooper and Dunkelberg (1987) argue that the education level of entrepreneurs is mostly above the regional average, and Robert (1970) notes that the majority of the high-tech firms' founders have a master's degree. Moreover, Blanchflower (2000) assert that most of the individuals with higher education level have relatively strong entrepreneurial tendencies and naturally support regional entrepreneurship, and Blanchflower (2004) also indicates that there is a positive relationship between the rates of master's degree alumni and the level of high-tech start-ups in developed countries.

In addition to these, Baltzopoulos and Broström (2013), examining the propensity of graduates to entrepreneurial activity, suggest that university may play a significant role in the development of regional entrepreneurship. Within this framework, Stuart and Sorensen (2003) point out that higher education experiences can serve as a basis for personal networks, and thus contributes to the social capital of the region, which is crucial for entrepreneurial activities. Besides social networks, higher education experience may enable alumni to gain knowledge and experience about/within the local market (Baltzopoulos and Broström, 2013). Hence, alumni can engage entrepreneurial

activities in region where they graduated. Furthermore, university and R&D expenditure per capita have a positive effect on new business formation (Acs et al., 2002). Therefore, it is expected that the presence of university, which generates innovations, social networks, social and human capital, may stimulate regional entrepreneurial activities. Consistently, Audretsch and Lehmann (2005) report a positive nexus between knowledge-based start-ups and the number of university students. Low, Henderson and Weiler (2005) also argue that countries with higher college educational attainment have higher level of entrepreneurial activity and income.

Acs and Armington (2004), in this respect, summarize the effect of education on new firm formation as follows: Firstly, regions with high educated population generate higher level of human capital, playing a major role in application of new ideas and creation of new entrepreneurial opportunities (Glaeser et al., 1992). Secondly, such regions can create a richer environment in terms of dissemination of knowledge, which is an essential source of new business opportunities. Lastly, due to high concentration of skilled knowledge workers, the formation rates of new firms are expected to be high in these regions. Therefore, regions with higher educated people should have higher level of start-up activity. Also, it is expected that there is a positive relationship between the rate of new business formation and educational attainment levels in a region.

In conjunction with education, however, especially after the 1980s, the concept of human capital, which is a crucial factor of economic growth, has attracted considerable attention of many scholars. The notion of human capital refers to the role of training, education, experience, and knowledge in economic growth (Doh and McNeely, 2012). In other words, human capital can be defined as the stock of knowledge, skills, capabilities and other attributes embodied in individuals that stimulate and facilitate productive and innovative activities (Becker, 1975; Coleman, 1988; OECD 1996). In this respect, human capital theoreticians argue that through knowledge, individuals can improve their cognitive abilities and critical thinking skills, and thus they can be more productive and effective (Becker, 1964; Schultz 1959). Hence, human capital, as an essential source of entrepreneurship, has been considered as a crucial factor for the (regional) economic development and competitiveness.

In this regard, higher levels of human capital have been determined as a key driver for improving competitiveness and efficiency at the firm and regional level (Lucas, 1988; Barro and Sala-i-Martin 1992). Furthermore, human capital has been described as a stimulus of the entrepreneurial activities and innovation processes (Maskell and Malmberg, 1999). Also, Dakhli and de Clercq (2004) indicate that by increasing entrepreneurial activities in a region, the development of human capital can improve core competitiveness and facilitate innovation processes. Consistently, several researchers have argue that because individuals equipped with high-quality or more human capital are better in perception of the business opportunities in a market and have superior ability to successfully take advantage of these opportunities, they have a higher probability to launch a new business (Davidsson and Honig, 2003; Renko et al., 2012; Keen and Etemad, 2012; Urbano and Turró, 2013). Similarly, Arenius and de Clercq (2005) assert that as an important mechanism, individual's human capital positively affects the access to network resources and opportunity recognition that are relevant to entrepreneurial activity. Moreover, Schuller (2001) points out that as new economic opportunities arise individual with more human capital should have a higher probability of perceiving and taking advantage of them.

Like education, experience and knowledge, creativity is also an important aspect of human capital. Particularly, since the seminal work of Florida (2004), creative class (i.e., artists, performers, musicians, authors, educators, architects, designers, engineers, scientists, and others), by generating new knowledge, new technology and new production organization, has been seen as a key drivers for the regional economic development and as a source of new firm formation (Acs and Megyesi, 2009). In this direction, Lee et al. (2004) and Florida (2005) found that the creativity and human capital has a significant and positive effect both on the formation of high-tech industry and entrepreneurship. Florida (2002) also supposed that creativity play a crucial role in the regional economic development success. In a similar vein, Florida (2011) indicated that cities and regions rich in creative people have experience high level of innovative activities and new firm formations (Audretsch and Belitski, 2013).

On the empirical side, there are several studies highlight the importance of human capital (and creative class) for entrepreneurial activities. For example, Dess et al. (2003)

demonstrate that a high level of human capital may generate opportunities for the creation of new knowledge that leads to the formation of new business opportunities. In addition, Davidsson and Honig (2003) have found a positive correlation between human capital and the process of entrepreneurial activity. Likewise, Colombo and Grilli (2005) have indicated that there are a strong connection between entrepreneurs' human capital and the growth rates of new technology firms. Also, Alpkhan et al. (2010) show that investments made to enhance human capital and education has a positive effect on the organizational innovation processes. Furthermore, Lee, Florida and Acs (2004) have found a strong and positive link between new firm formation and creativity.

Therefore, because of the fact that human capital (and creative class) generates more knowledge, innovation process and new business opportunities, it could be supposed that regions with a high share of human capital (and creative class) are more likely to have a higher rate of individuals who have entrepreneurial intention and have engaged in start-up activities.

Finance Capital

Many entrepreneurship scholars suggest that availability of and access to financial capital (i.e., angel investors, venture capital, and bank deposits) is crucial in the development of regional entrepreneurship, otherwise lack of it may result in limited entrepreneurial activity in these regions (Kim, Aldrich, and Keister, 2006; Kalantaridis and Bika, 2006; Bettignies and Brander, 2007; Müller, n.d.; Cetindamar et al., 2012). Entrepreneurs often have difficulty in access to capital, however; easy access to a large pool of capital can stimulate the emergence and success of potential entrepreneurs (Evans and Jovanovic 1989; Low, Henderson, and Weiler, 2005). By the same token, Taylor (2006) argues that regions that have high level of entrepreneurial activity generally have a strong network of angel investors and venture capitalists. In addition, The National Commission on Entrepreneurship (2002) point out that equity capital offers significant opportunities for turning personal intensions into new ventures. Consistently, Gaston (1989) and Gompers (1999) have asserted that the vast majority of the newly established enterprises initially meet the needs of financial resources from family and friends, but they may still require additional financial resources, and thus, in

this case, the presence of regional financial capital is critical to the success of regional entrepreneurship. Moreover, Marlow and Patton (2005) assume that there is a general consensus that access to more finance significantly contributes to the development of entrepreneurship. For example, Pena (2002) suggests that a greater quantity of financial capital enables entrepreneurs to be more flexible and to develop more strategies for discovering and entering new markets.

In this context, there are several empirical studies that highlight the importance of financial capital for entrepreneurship. For example, Banerjee and Newman (1993) indicate that when economic development level increase, the number of start-ups starts to rise because people in such an environment can access required financial resources more easily. This is consistent with Wennekers et al. (2005) who concluded that there is a U-shaped relationship between the level of economic development and start-ups rates. Also, Garofoli (1994) and Suteria and Hicks (2004) found a positive and significant relationship between the rates of new firm formation and asset ownership (bank deposits per capita). In addition, it has been found that the existing financial resources strongly affect the possibility of people to become entrepreneurs (Evans and Jovanovic, 1989; Kan and Tsai, 2006; Hurst and Lusardi, 2004). In addition, Verheul et al. (2002) found that a well-developed venture capital market have a positive effect on regional entrepreneurial activity.

The evidence suggests that because most people need financial capital to start a new business, the presence and accessibility of financial capital plays a very important role in the development of national or regional entrepreneurship. Thus, it could be deduced that regions with higher level of financial capital such as venture capital, angel funding and loans are likely to have more entrepreneurial activities.

Social Capital

The concept of social capital, in recent years, has drawn attention of numerous researchers in different disciplines such as anthropology, political science, management, regional studies, and economics. In particular, during the last two decades, social capital, like entrepreneurial capital, human capital, knowledge and financial capital, has been

considered as an important driver of economic development and regional entrepreneurship.

The literature on social capital argued that social capital, related to civic participation, trusts and social networks, has positively influence innovative activity and economic development (Knack and Keefer, 1997; Putnam, 2000; Dakhli and de Clercq, 2004). Because social capital facilitates the dissemination of useful information and knowledge between economic actors (individuals and organizations) and may increase the production of new knowledge, it has been considered as an essential determinant of economic development and driver of entrepreneurship (Landry et al., 2002). In addition, many of these studies argue that social capital tends to be geographically bounded, and thereby, it can reduce the verification costs, transaction costs, decision costs, and information and search costs during the production processes of organizations that may lead to higher levels of economic activities in an area (Laursen et al., 2007). Hence, many scholars supposed that social capital is one of the key drivers of entrepreneurial activity in an area (Thornton and Flynn, 2003; Aldrich and Martinez, 2003; Audretsch and Keilbach, 2004).

Furthermore, it has been demonstrated that through social capital, economic actors can obtain an easy access to resources, information and new markets (Larsson, 2012). Similarly, Stuart and Sorenson (2005) claim that social capital in a cluster may positively affect the formation of new firms by providing interaction and cooperation between firms for the exchange of information and resources. Consistently, Putnam (1995) indicates that because social capital facilitates cooperation and coordination for mutual benefit, it may result in increased start-ups activities in such regions.

Besides these, as an important component of social capital, many researchers have paid increasing attention to trust due to its role in the economic development and entrepreneurial activity. Fukuyama (1995) indicated that trust stimulates increased interaction and cooperation within and between economic actors and thus it can facilitate the exchange of resources such as knowledge, information, and skills. In this respect, it is considered that regions with high levels of trust may provide more favourable conditions for entrepreneurial activities, which, in turn, may refer high level

of economic development (Doh and McNeely, 2012). In a similar direction, several researchers claim that through reducing costs and time of monitoring and increasing interaction and cooperation, trust can lead to increased innovation and the formation of new firms in a region (Dakhli and de Clercq, 2004; Akçomak and ter Weel, 2006). Therefore, one can state that there is a positive relationship between trust and regional entrepreneurship.

To sum up, as indicated by Baumgartner et al. (2013), social capital is both a driver and an outcome of the entrepreneurial activity, referring that social capital may lead to the formation of new businesses, and at the same time, it can be generated through the networks, norms and trust between entrepreneurs. Depending on the relationship between entrepreneurship and social capital, Baumgartner et al. (2013) also argue that social capital has a different importance for each type of entrepreneurship. Firstly, due to the fact that social capital refers an easy access to resources, a high level of interaction and cooperation, and trust within or between groups, it is recognized as an essential source for ethnic minorities and “immigrant entrepreneurship”. Secondly, as a ‘networking capital’, social capital has a significant impact on “community entrepreneurship”. In this sense, it is argued that this networking capital enable potential entrepreneurs to perceive, evaluate and exploit the existing business opportunities in the market to start a business (Davidsson and Honig, 2003; Kim and Aldrich, 2005; Casson and Giusta, 2007). Hence, the higher degree of social capital (or networking capital) in an area refers to the higher level of new business formation (Westlund and Bolton, 2003). Thirdly, it is widely accepted that social capital can be generated and developed by local initiatives, through enhancing mutual trust and creating social values in a society (Putnam, 1993). Thus, Baumgartner et al. (2013) point out that social capital is positively associated with “social entrepreneurship”.

As a consequence, a review of literature demonstrates that social capital has positively affected both regional economic development and regional entrepreneurship. Because social capital, through creating strong social network, common values, civic norms, and mutual trust in a society can reduce the costs of starting a new business and doing business, and can increase interaction and communication within and among economic actors, there is an increasing likelihood of the sharing of resources, and thus, high levels

of start-ups activities. In light of these arguments, one can expected that regions with strong social capital or trust may have higher levels of regional entrepreneurial activity.

3.2.3.2. Economic structures of the regions

Demand for new goods and services

The literature on entrepreneurship has often argued that a higher wealth and income level of people have a positive impact on the regional entrepreneurial activity. In this respect, because higher wealth and income levels are strongly associated with a greater demand for new and differentiated products and services (Shane, 1993; Reynolds, Storey, and Westhead, 1994), the more capacity of spending (Bergmann, 2011), and a greater supply of inputs (Stam, 2010), can generate more business opportunities and stimulate entrepreneurial activities in a region. Audretsch and Fritsch (1994) have also shown that due to high level of demands and needs for new services and products in regions with relatively higher level of Gross Domestic Product (GDP), people are pushed into entrepreneurship. In other words, Knoblenz, Ponds and van Oort (2011) have indicated that an increase in regional economic growth can trigger the growth of regional demand, and that leads to an increase in the level of regional entrepreneurial opportunities.

Within this perspective, there is evidence that an increase in GDP per capita generates a positive influence on entrepreneurship (Audretsch, 2012). Furthermore, it is demonstrated that the level of wealth and income generates various consumer demands. Hence, the growing diversity in demands has been seen as an important factor affecting positively the supplier of specialized and new products and services that refers to new business opportunities and induces new business formation (Reynolds et al., 1994; Wennekers et al., 2002; Fritsch and Schroeter, 2011). Consistently, Minniti et al. (2006) have indicated that regional income level has an influence on the level of regional entrepreneurial activity, by generating demands for new goods and services. Similarly, Armington and Acs (2002) and Lee et al. (2004) have found a positive association between the level of income and the rates of start-ups activities.

To sum up, this evidence shows that regional income levels have positive effects on regional demands that refer new business opportunities in the market. Thus, it is highly

probable that regions with high levels of incomes have greater demands that stimulate the creation of new business opportunities, reflecting higher start-ups activity in such regions.

Cluster and Industrial Agglomeration

The notion of cluster has been described as “*the spatial agglomeration of enterprises and related supplier, and service industries*” (Mytelka and Farinelli, 2000, p.7). Rocha (2004) and Rocha and Sternberg (2005) identify three crucial dimensions of cluster as follows: (1) an inter-organisational or institutional network, which means the relationship between government agencies, non-governmental organizations and firms within the cluster (Saxenian, 1994; Aydalot, 1986); (2) an inter-firm network, including commercial, non-commercial and informal relationships between companies in a cluster (Storper, 1997), (3) and a geographical proximity, meaning the co-location of firms (Baptista and Swann, 1998; Swann et al., 1998).

Based on these definitions, particularly, after the seminal work of Marshall (1920) the following three features of industrial agglomeration/cluster have begun to draw attentions of many researchers: rich and diverse labour pool, input-output linkages and knowledge spillover that have been considered as the essential elements for the increase of entrepreneurial activity in a region (Rosenthal and Strange, 2001).

In this direction, Delgado, Porter and Stern (2010) point out that the existence of a cluster in an area will stimulate entrepreneurship through reducing the opportunity costs of launching new business, providing an easy access to a variety of inputs and complementary products and ensuring opportunities to exploit innovative activities. Also, according to Porter (2000) the presence of various organizations, firms, suppliers and customers within a cluster will offer an environment for the emergence of new inventions and innovations that are of vital factors for the entrepreneurial activities. In addition, Delgado et al. (2010) argue that a strong regional cluster can prolong the survival rates of new and established firms by increasing their efficiency. Furthermore, Braunerhjelm (2010) indicates that cluster, through facilitating access to necessary capitals, large markets and new ideas, and increasing regional comparative advantages, is one of the main drivers behind the rise of entrepreneurial activities in a region.

Consistently, due to eliminating barriers to entry and growth, enabling new firms to benefit from local sources to reach new markets, and creating an appropriate environment for innovation-based entries, clusters increase the numbers of new firm formations and support start-ups to be successful in the regions (Saxenian, 1994; Delgado et al., 2005; Feldman et al., 2005).

In addition to these, Stinchcombe (1965) puts forward that as the crucial factors of regions, industrial agglomerations help entrepreneurs to cope with problems in the establishment phase, for instance, new firms may face the lack of resources, lack of networks with suppliers and customers, needs of labour, and new roles and procedures need-to-know. Minniti (2005) also argues that the presence of a large number of entrepreneurs, who are the source of inspiration for others and acting as role models, within the clusters may lead to the formation of new businesses in the respective regions. Moreover, the interactions between firms and other organizations generate an environment that facilitates the flow of a variety of ideas and resources within a region, and that refers to suitable incubation conditions for entrepreneurial activities (Koo and Cho, 2011).

In line with these arguments, the Marshallian and Californian approaches assert that clusters or industrial agglomerations have a positive effect on entrepreneurship (Rocha and Sternberg, 2005). According to Verheul et al. (2002), clusters positively affect entrepreneurship due to having successful technological advancements and informational advantages. Glaeser and Kerr (2009) also found that a higher level of new firm formation in a region is strongly associated with the presence of cluster. Similarly, Sternberg (2012) has argue that although the relationship between entrepreneurship and cluster may differ from time to time, region to region or sector to sector, the general theoretical debates have pointed out a positive relation between them. Regarding the positive impacts of agglomerations on entrepreneurship, Knobens, Ponds and van Oort (2011) put forward that the economic benefits of agglomerations create an attractive environment for many entrepreneurs. Moreover, Van Ort and Stam (2007) demonstrate that there is a positive relationship between agglomeration and entrepreneurship. In addition, several researchers have found a significant positive effect of industrial

agglomeration on the level of entrepreneurial activity (Reynolds et al., 1994; Armington and Acs, 2004; Fritsch and Falck, 2007).

In contrast, because a large numbers of firms within a cluster require to similar resources, produce same products and services, and do business in the same market, the competition between them will increase, and thus some researchers have argued that agglomerations can negatively affect entrepreneurship (Beesley and Hamilton 1994; Sorenson and Audia, 2000; Bosma, van Stel and Suddle, 2008; Fritsch and Mueller, 2008).

Overall, according to the literature, the advantages of cluster for entrepreneurs can be briefly described as follows: reputation, networks, knowledge spillover, learning, imitation, rich and diverse resources, skilled labour market, low entry barriers, lowering inter-firm shipping, and reduced transaction costs (Cooper and Folta, 2000; Malmberg and Maskell, 2002; Parr, 2002; Harrison et al., 2004). These enable entrepreneurs to exploit important economic benefits such as new business opportunities, new markets and necessary resources. Therefore, clusters stimulate the formation of new firms and foster entrepreneurship in such environments. Thus, it is highly likely that regions with clusters/industrial agglomerations will have higher level of entrepreneurship than the regions without clusters/industrial agglomerations. However, as explained above, due to the fierce competition the impacts of clusters/industrial agglomerations on regional entrepreneurship can be negative.

Network

Networks are, in general, consist of both physical networks (i.e., telecommunication, railway, road or aviation networks) and virtual networks (i.e., information and/or knowledge networks) (Fischer and Nijkamp, 2009). Also, networks can be at global and/or local levels. According to Andersson (1985), networks facilitate the mobilization of information and resources and the creation of entrepreneurial spirit and industrial diversity within or between regions. In general, Fischer and Nijkamp (2009) point out that the networks among local business are considered as the mechanisms that support the formation of creative entrepreneurship. In other words, since inter-firm networks generate an environment that favours the flow of a variety of information and resources,

encourages the increase of entrepreneurial activity in such environments (Koo and Cho, 2011).

In addition, especially the recent developments in the information and communication technology (ICT), which is an essential factor underlying the strengthening of local and national networks, have lead to many novelties in terms of workforce acquisition, entrepreneurial processes, management practices, communications, and interaction between firms (Beuthe et al., 2004). Thus, through the ICT the importance of networks among business world has dramatically begun to increase. In this sense, Nijkamp (2009) asserts that such developments in networks will provide advantages for entrepreneurship.

Based on these arguments, many theoretical and empirical studies in recent years have drawn attention to the importance of networks for entrepreneurial activities. For example, networks have been considered as the significant drivers that help entrepreneurs to obtain required information, labour force, resources, and services and to recognize and exploit business opportunities (Aldrich and Zimmer, 1986). In a similar direction, several authors argue that through networks entrepreneurs can easily access to other resources and opportunities (which are not found in their workspace) and receive practical and psychological supports (i.e., consultancy, information, and financial) (Johannisson, 1986; Burt, 1992; Ostgaard and Birley, 1996; Klyver et al., 2008). Furthermore, as a new phenomenon in modern economies, networks enable entrepreneurs to set up local/global communications and interactions and to exploit knowledge spillover, seen as crucial factors that play critical roles in the entrepreneurial success (Nijkamp, 2009). Moreover, Malecki and Poehling (1999) have observed that strong network configurations (i.e., knowledge networks, professional networks, consumer networks, supplier networks, and networks within or between regions) in a region have a significant and positive effect on entrepreneurship. Similarly, Stuart and Sorenson (2005) have found that inter-firm networks within a cluster affect the entrepreneurial process positively, by supporting nascent entrepreneurs to obtain necessary resources and to benefit from new business opportunities.

Consequently, the literature shows that networks are positively associated with new business formation in a region. Hence, Nahapiet and Ghoshal (1998) indicated that the emergence of new enterprises without networks seems impossible. Thus, it could be argued that because networks are critical success factors for entrepreneurial activity, regions with strong local networks are likely to have levels of entrepreneurship or new firm formations.

Underexploited Knowledge

Since the 1980s many researchers have paid increasing attention to the knowledge due to its role in the economic development theories. Particularly, the dynamic knowledge externalities that arise from the spillover of existing knowledge are of paramount importance (Monastiriotis, 2000). However, as known that knowledge has a high level of tendency to spillover from the organizations (universities, research institutions and incumbent firms) produced and due to diverse reasons these organizations are not willing to or able to exploit these new knowledge, a number of tools are needed to ensure the formation of these external spillovers and close this gap (Bishop, 2012). In this context, Audretsch and Keilbach (2007) point out that the underexploited knowledge generated by incumbent firms creates new entrepreneurial opportunities, and thus entrepreneurs, in general, have propensity to locate close to external knowledge sources. Consistently, several authors have indicated that the greater stock of knowledge refers to the higher amount of unexploited knowledge spillover, as a source of entrepreneurial opportunities, leads to a higher level of new firm formation in a region (Audretsch and Keilbach, 2006; Acs et al., 2009; Bishop, 2012; Qian, Acs and Stough, 2013). In other words, a lack of entrepreneurship may cause lower returns of knowledge and thus less economic growth (Audretsch and Lehmann 2005; Fritsch 2008).

In this context, a study conducted by Audretsch et al. (2006) has found that a high level of R&D activities is associated with a high level of new business formation. Acs and Armington (2003) also demonstrated a positive relationship between the knowledge spillover and entrepreneurial activity. Moreover, Audretsch and Lehmann (2005) indicate that the knowledge capacity of a region and university knowledge inputs and outputs positively affect the rates of start-ups.

To sum up, the literature shows that there is a positive relationship between entrepreneurship and the investment of R&D activities and knowledge capacity of a region. In addition, the potential of knowledge externalities is considered as an essential success factor for entrepreneurial processes. Also, it has been demonstrated that the knowledge spillover have a significant effect both on entrepreneurship and regional economic development. Thus, it could be expected that the number of (knowledge-based) entrepreneurs or new business formation is most likely higher in regions with higher levels of knowledge investments and knowledge capacities.

The share of employment in small firms/businesses

Concerning the potential entrepreneurs' qualifications a number of researchers have found a positive relationship between the previous work experience and the tendency to start a business and the formation of new business (Lazear, 2004; Lin et al., 2000; Acs and Megyesi, 2009). In this regard, Reynolds et al. (1994) argue that interregional studies regarding new firm formation demonstrate that the share of employment in small firms/businesses has a positive influence on the entrepreneur's decision to start-up. In a similar direction, several authors have indicated that working in a small firms/business may allow individuals to improve their entrepreneurial capability that enhances the probability of the employees of these businesses to become self-employment (to launch a business) (Sorensen and Audia, 2000; Beesley and Hamilton, 1984). A proper explanation for this result is that as compared large firms, small firms/businesses have a lesser division of labour, and therefore, it is highly-likely that the workers in these firms have relatively a greater level of tacit knowledge that is necessary to establish a new company, than workers in large firms (Fritsh and Falck, 2007). These are also consistent with the empirical studies of several researchers who concluded that before establishing their own businesses, many entrepreneurs worked in small firms/businesses (Wangner, 2004; Armington and Acs, 2002; Johnson and Catcart, 1979a). In addition, it was observed that a high number of small firms' employees in a region are strongly associated with a higher level of entrepreneurship that can also stimulate the formation of new businesses in this region (Sorensen and Audia, 2000). Therefore, a high level of new firm formation or entrepreneurship can be expected in regions with relatively a high share of employment in smaller firms/businesses.

The share of employment in service/manufacturing sectors and in public/private sector

It is widely acknowledge that the levels of start-ups activities in regions are considerably diverse between industry sectors (Bates, 1995; Tamasy, 2006; Fritsch, Brixy, and Falck, 2006). In this sense, Brixy and Grotz (2007) argue that as compared to manufacturing sector, the costs of starting a business is generally much lower in the service sector. Similarly, several researchers point out that while starting a business in service sector usually necessitates relatively advanced education and small financial capital, it can require larger capital and resources for manufacturing sector, and thus because of the lower entry costs in the service sector, regions with a high share of service sectors should be associated with a high rates of start-ups activities (Bates, 1995; Reynolds et al., 1995; Fritsch, 1997; Brixy and Grotz, 2007). Consistently, Acs, Desai and Hessels (2008) put forward that the higher employment rates in the service sector, the higher levels of small firms/businesses in a region that refer more opportunities and rooms for entrepreneurial activities. These arguments also supported by Kibler (2013) who asserts that while the higher share of employment in the service sector supports entrepreneurial attitudes and stimulates the formation of new businesses, the higher participation levels in manufacturing sectors negatively affect entrepreneurial activities. Within this framework, one can say that due to the need for less financial capital, resources and the other entry costs, as compared to the manufacturing sector, being an entrepreneur in the service sector is much easier. Therefore, it could be argued that the higher regional share of employment in the service sector should have a positive relationship with a high level of entrepreneurial activity.

As indicated above, the sectoral structure of a region may play a crucial role on the regional entrepreneurial processes. In other words, several studies show that the variations in the levels of start-up activities are closely related to industrial structure of regions (Brenner and Fornahl, 2008; Fotopoulos and Spence, 2001). In this regard, it is argued that the pattern of regional entrepreneurship can also be affected the rate of employment in the public and/or private sectors. Lundström and Stevenson (2005) have found that the public sector have a negative effect on regional entrepreneurship due to minimizing an open and equal competition and new business opportunities. Similarly,

Sørensen (2004) and Torrini (2005) indicate that because the public sector may play a decisive and restrictive role on the private enterprises' scope, it can adversely affect new business formation in regions. In addition, Özcan and Reichstein (2009) find that as compared to the private sector, the employees in the public sector have lower propensity to start a firm. The basic explanation for these results may be that since the entrepreneur is a risk-taker and the workers in the public sector are less inclined to take risks, the likelihood of a person to become an entrepreneur is low in this sector, as compared to private sectors. Thus, as demonstrated by Kibler (2013), the higher rate of employment in the public sector may weaken an entrepreneur-friendly environment in the regions, and thus may prevent the creation of entrepreneurial intentions. Therefore, one could suppose that the higher regional rate of employment in the public sector should have a negative effect on regional entrepreneurial activity.

3.2.3.3. Institutional structures of the regions

Similar to above determinants, institutions also play critical roles on the regional entrepreneurial activity. Institutions are described as the rules of the game in a society, and opportunities and constraints that shape human interaction (North, 1990, p.3). Diaz et al. (2013) argue that in a broad sense, institutions consist of specific rules and regulations governing the society, and further, directing and conditioning the relations derived from the society. In this line, institutions can be formal (i.e., political and economic rules and contracts, property rights, and laws) or informal (i.e., values, attitudes, beliefs, ideas, conventions, and code of conduct) (North, 1990, 2005).

Since the 1990s, the nexus between economic growth, institutions and entrepreneurship has become as a central area of inquiry within the study of regional economic development and entrepreneurship. The notion that institutions are significant success factors for economic growth and entrepreneurship is firstly put forward by William Baumol (1990, 2008). In his seminal work, Baumol (1990) argues that institutions play crucial roles on the allocation of entrepreneurship as 'productive, unproductive and destructive'. While good institutional arrangements stimulate 'productive entrepreneurship', described as a key driver of economic development, weak institutional structures may lead to the emergence of 'unproductive and destructive

entrepreneurship' that cannot be able to generate adequate outputs for economic development (Baumol, 1990,2008). Similarly, North (1990, 2005) emphasizes the importance of institutions for entrepreneurial dynamics. According to North, institutions can generate new opportunities and incentives for entrepreneurial activities via shaping economic activity. These arguments are also affirmed by Wennekers and Thurik who indicate that a good institutional arrangement is one of the fundamental reasons behind of the long-term economic growth and the high level of entrepreneurial activity.

In addition, Kwok and Tadesee (2006) point out that institutions may have effects on innovative activities of entrepreneurs by providing financial resources, investing in education, supporting scientific research, and making important legal arrangements. Hence, the level of entrepreneurial activity and the types of entrepreneurship may vary across regions or countries due to institutional structure of these areas (North 1994; Autio, 2007; Acemoglu, Agion and Zilibotti, 2007). In this context, many researchers have revealed that the quality of institutions play a key role in the development of the regional entrepreneurship. Regarding this, Acemoglu (1995) indicates that the lack of good institutions in any given areas may result in the bad allocation of entrepreneurial ability, and thus the rate of economic growth and new (innovative and productive) business formation will be relatively low in such areas that are, in general, experienced in underdeveloped economies. From another perspective, Dias and McDermott (2006) assert that better institutional policies can remove barriers that prevent the development of productive entrepreneurship (Cravo, 2010; Cravo et al., 2012).

Besides these, in recent decades the numbers of studies that analyze the effect of institution on economic growth and entrepreneurship have gradually increased. For example; Johnson et al. (1997) have found that the existence of weak institutional arrangements push entrepreneurs to take less responsibilities and force them to concentrate more on unproductive and informal activities. In contrast, according to Audretsch et al. (2002), institutions can generate new business opportunities for entrepreneurs that may result in economic growth and prosperity in a region (Hall and Sobel, 2008l). Moreover, Nystrom (2008) indicates that institutional quality plays a significant role in entrepreneurial activity, due to the fact that the failure of the institution leads to entrepreneurs to be unsuccessful. Similarly, because institutional

failure causes new legal/regulatory difficulties and financial constraints, it may prevent the formations of new firms (Beck et al., 2005).

As a one of the important dimensions of the institutions, several researchers argued that regulation can also have an essential impact on (regional) entrepreneurial activity. In other words, Torrini (2005) argues that taxation and regulation play crucial roles in the distribution of labour between wage-employment and self-employment.

In this framework, Begley et al. (2005) put forward that due to many procedures and rules, many employees in the large or small firms may be reluctant to start a business. In a similar vein, it is widely acknowledge that the factors like costs, time and the number of procedures are needed as establishing a new company have an adverse impact on entrepreneurial activity (Urbano and Turró, 2013). According to Torrini (2005), the heavier administrative and regulatory burdens may negatively affect economic activities, as well as the entrepreneurial intentions. In addition, several researchers have declared that some regulations like unemployment benefits may have a negative effect on self-employment, because unemployed individuals who receive unemployment benefits most probably have low propensity to start a new business (Robson, 2003; Parker and Robson, 2000; Staber and Bogenhold, 1993). These claims were also supported by the National Governor's Association (NGA, 2004) report, asserting that excessive regulations may discourage entrepreneurs from establishing new companies (Taylor, 2006). Bosma and Schutjens (2011) make a similar argument, indicating that traditional strict national regulations for the new registration process may deter entrepreneurs from launching new businesses, and that may cause the disappearance of entrepreneurial intentions within an area.

Besides these, de Soto (1990, 2003) put forward that legal deficiencies, bureaucratic obstacles and cumbersome operation of the institutional structure force/push people into unregistered (informal) activities. Consistently, Djankov et al. (2002) have found a close relation between excessive regulations of entry and corruption and informal entrepreneurial activity. The European Commission (1998) also declares that administrative and regulatory burdens are among the major causes of preventing (formal) start-up activities and of starting the informal activities. These arguments are

also supported by Loayza (1996) who argues that exceeding arrangements and taxes imposed by the government that result in high entry costs and make the formal economy less attractive, cause an increase in the informal sector.

On the other hand, Havrylyshyn (2001) and Kaufmann et al. (2006) suggest that efficient regulation of the economy, good political and economic institutions, easy and transparent legal procedure, well-defined property rights, and solid laws are 'sine qua non' for the stimulation of (formal) entrepreneurship in a region. In addition, Klapper et al. (2009) argue that an improved legal framework in favour of entrepreneurs in a region substantially provides an increase in the number of formal businesses. In this context, in recent decades many regional and national governments through making new and effective regulations try to encourage entrepreneurs to start new businesses in their areas.

Similar to regulation, taxation, as one of the institutional variables, in recent decades has been highlighted as a significant factor that play a crucial role in determining the rate of new business formation or self employment. It is widely accepted that the relationship between taxation and the level of entrepreneurial activity is complex and even paradoxical (Verhul et al., 2002).

A study conducted for OECD countries by Fölster (2002) demonstrates that the total tax burden has a negative effect on the rate of entrepreneurship. Guesnier (1994) provides additional support for this argument, assuming that because higher taxes lead to the emergence of additional entry costs, they may adversely affect the level of new business formation. Moreover, OECD (1998a) reported that because high taxation reduces the income of entrepreneurs, it may prevent the formation of new firms and the growth of established firms. From another perspective, Bruce and Gurley (2005) have found that a decrease in the marginal tax rate may raise the likelihood of a person starting a new business. Several researchers also have shown a significant negative impact of higher taxation on the dynamics of the start-up process (Gentry and Hubbard, 2000; Verheul et al., 2002; Cullen and Gordon, 2007; Hansson, 2008).

Besides these, some empirical studies have found evidence that high tax rates stimulate the formation of new business (self-employment). For example, the studies conducted

by Robson (1998) and Parker (1996) for the UK, Evans and Leighton (1989a, b) and Blau (1987) for the US, Robson and Wren (1999) for OECD countries, and Shuestze (2000) for the US and Canada demonstrate that tax rates have a positive impact on the rate of self-employment (Torrini, 2005). In addition, several researchers argue that because self-employment provides better opportunities to avoid or evade tax burdens for (high-income) individuals than paid employment, the taxation may increase the propensity of these individuals to become an entrepreneur (Shuestze, 2000; Parker, 1996; Evans and Leighton, 1989a,b; Blau, 1987).

To sum up, following the early 1990s, many researchers have started to emphasize the importance of institutions for economic growth and entrepreneurial activity. The literature on (regional) economic development has demonstrated that institutions, by determining the rules of the game, have effects on entrepreneurship. While good institutional arrangements have a positive effect on regional economic development and start-up activities, weak institutional arrangements negatively affect. In other words, Hall and Sobel (2008) have claimed that differences in the level of regional entrepreneurial activities can be explained by the differences in quality of institutions. In this context, one can say that the institutional structure of regions may play an essential role in the allocation of entrepreneurial activity in terms of productive, unproductive and destructive. As a consequence, the relation between institutions and entrepreneurship is complex, and especially varies depending on the quality of institutions. Therefore, it can be expected that a good and quality institutional structure should positively correlated with a higher level of (innovative and productive) entrepreneurship, economic growth and technological development in a region.

Besides, according to the literature (entry) regulations also play a key role in determining the level of new business formations. It is widely accepted that while regions/countries with heavier administrative and regulatory burdens are less attractive areas for entrepreneurial activity, regions/countries with effective and less regulations are more attractive areas for entrepreneurial dynamics. Therefore, one can state that differences in the level of regional entrepreneurial activities can be explained by the differences in regional regulation.

Likewise, the literature demonstrated that the relationship between taxation and the likelihood starting new businesses can be both positive and negative. While in some countries/regions the higher tax rate (corporate or personal income taxes) can spur the self-employment rate (in order to avoid or evade taxation), it can discourage entrepreneurial activities (due to the additional costs of entry and reducing the returns on entrepreneurship) in other countries/regions. The literature explains this difference based on the attitude of the governments. In other words, it is dependent on the governments' attitudes towards tax evasion and the encouragement of entrepreneurship. Given the fact that governments recently have made new arrangements (in terms of taxation, entry regulations, and financial resources) to attract entrepreneurs and entrepreneurial intentions. Therefore, one can state that regions with lower tax rate and higher incentives may have higher level of entrepreneurial activity.

3.2.3.4. Cultural characteristics of the regions

It is widely accepted that the cultural²⁴ structure of a region has an impact on regional economic environment, and thereby, can shape regional entrepreneurial activity (Freytag and Thurik, 2007). Stuetzer et al. (2014) argued that cultural beliefs and values of people might have effects on the perception and behaviour of local population especially regarding business successes and failures, risk and uncertainty attitudes and innovative behaviour (Stuetzer et al., 2014). Hence, it should be not surprising that regional cultural characteristics can have an important impact on the individuals' decisions to become self-employed or wage-employed (or the entrepreneurial intentions of people) (Mueller and Thomas, 2001).

In this respect, Edmund Phelps (2006) argued that culture of nations may induce the differentiation of the nations' economic performance in terms of prosperity, productivity, production style, and personality development. Consistently, it has been put forward that culture may affect the entrepreneurial dynamics of a region, and thus, can explain the

²⁴ According to Hofstede (2001, p.9), culture is *"the collective programming of the mind that distinguishes the members of one group or category of people from another."* One culture may be different from other cultures because of its institutions, organizations, structures and its way of coping with various environmental problems (Williams and McGuire, 2010). For instance, each culture may have different responses against the changes in the status quo, attitudes towards diverse ethnic and religious groups, and perspective in the context of independence, leadership and management (Geletkanycz, 1997; Adler 1997; Hofstede 2001).

differentiation of their contribution to regional economic development (Ma and Todorovic, 2012). In addition, some psychologists and sociologists have claimed that cultural diversity is strongly associated with the differences in the nations/regions types of entrepreneurship, economic development level and scientific, institutional, and social variables (Schwartz, 2004, 2008; Hofstede, 2003; Inglehart, 1997).

Based on these claims, in recent decades several studies have explored the nexus between culture, economic development and entrepreneurial activity. In this framework, the role of culture in economic development and regional entrepreneurial process were addressed in different ways. Basically, Wennekers (2006) has summarized the literature by three main viewpoints. In the first view, the relation between entrepreneurship and culture has been explained with the ‘aggregate psychological trait’ that puts forward that a region with a higher share of population with ‘entrepreneurial values’, most probably will have a higher level of entrepreneurial activities (Davidsson, 1995; Freytag and Thurik, 2007; Uhlaner and Thurik, 2007). The second view argues that the ‘moral approval’ and the ‘legitimacy’ degree of entrepreneurial activity in a society are crucial (Etzioni, 1987). In other words, a higher level of legitimation of entrepreneurial activity in a region can increase its recognition in a broader area and make the entrepreneurial carrier more valued, and thus generating more favourable conditions for entrepreneurial activity, referring that more tax incentive for individuals who have entrepreneurial intention to start a business, more emphasis on entrepreneurs in the society, and more places in education programs for entrepreneurship. The third view is based on the issue of ‘push’ individuals into entrepreneurial activities. This view asserts that the entrepreneurial dynamics in a region may result from the difference between the ‘potential entrepreneurs’ and the ‘other individuals’ in terms of beliefs, behaviours, values and opinions (Noorderhaven et al., 2004). In other words, this view puts forward that a value conflict and a disagreement between these two groups may occur in regions (with non-entrepreneurial culture), and thus, these problems push potential entrepreneurs out of (non-entrepreneurial) organization and into self-employment (Freytag and Thurik, 2007).

In addition to these, Verheul et al. (2002) argue that national/regional culture may affect both the demand and the supply side of entrepreneurship. They supposed that at ‘the

supply side', the preferences of individual for working as a self-employed may be caused by the cultural characteristics of a region that refers the nation or region's attitudes towards entrepreneurship have an impact on the individuals' decisions to become entrepreneurs or not. In this sense, several indicators of an entrepreneurial culture have been described by Reynolds et al. (1999) as follows: the importance given individuals starting a new business, the success stories about entrepreneurs in the media, and some heroes, rituals and symbols about entrepreneurs. Also, Reynolds et al. (1999) in an empirical study for ten countries have found a positive relationship between the degree of respect for entrepreneurs and the level of new business formation. In addition, they also find a positive correlation between the rate of start-ups and the values given independence in a society. Further, Verheul et al. (2002) put forward that the prevalence of entrepreneurial values within the politics and the governments' programmes may positively affect 'the demand side' of entrepreneurship. In other words, the presence of these values may increase the importance of private sector (especially entrepreneurial activity), and therefore, governments may facilitate the formation of new firms by fulfilling their demands/requirements in terms of personal services and utilities (i.e., reducing the entry procedures, providing financial resources, supporting innovative activities, and strengthening infrastructure and network).

From another perspective, Richard Florida (2004), in his book *The Rise of the Creative Class*, puts forward that the cultural characteristics of a region play a key role in the formation of creative class. He argues that rather than 'business climate', the type of 'people's climate' in a region is vital for entrepreneurial activity and economic growth. In addition, Florida asserts that not every region and country has an equal rate of creative class, namely, creative class is not equally distributed between them. In contrast, he assumed that creative class is attracted to places that have open-minded and tolerant societies, referring that such societies are open to new ideas and new people, and therefore include diverse population with different cultural and ethnical background (Boschma and Fritsch, 2009). According to Florida, because diversity lead to innovative activities in a region, the tolerance level of population play a crucial role in the formation of entrepreneurial activity. In other words, Florida has drawn attention to the cultural characteristics of regions. An open-minded, diverse and tolerant regional culture

is considered as the main driver of invention and innovation in a region. Regarding this, Saxenian (1999) has found a positive relationship between cultural diversity and the rates of start-ups activity in Silicon Valley. Also, Qian, Acs and Stough (2013) indicate that higher level of social diversity in a region may attract more creative people. Moreover, Kirchhoff et al. (2007) demonstrated that racial diversity has a positive impact on the formation of new firms. “

It recent years, many scholars have also put a special emphasis on the importance of entrepreneurial culture in the context of the new business formation. According to several researchers, the lack of or presence of entrepreneurial culture²⁵ or entrepreneurial climate in a region may play a crucial role in the subsequent entrepreneurial activity, referring the differences in the level of regional entrepreneurial activity in regions (Hoselitz, 1957; Soltow, 1968; Baumol, 1968; Leff, 1979). Wennekers and Thurik (1999) also point out that as an essential component of regional culture, entrepreneurial culture stimulates the formation of regional economies and clusters, and thus may lead to the increase of start-ups activities in regions. Similarly, previous research shows that regional entrepreneurial culture, by leading the generation of new enterprises, increases the numbers of entrepreneurs in a region (Feldman, 2001; Audretsch et al., 2010). Consistently, a number of studies have indicated that the impacts of entrepreneurial culture on the regional entrepreneurship can be explained with the parent effect which means that if the parents have their own businesses, the probability of starting a new business and becoming self-employment will increase (Dunn and Holtz-Eakin, 2000; Davidsson and Honig, 2003; Gianetti and Simonov, 2004). In other words, some researchers put forward that regions with higher rates of independent and smaller firms are more favourable for entrepreneurial activity than regions dominated by larger firms (Glaeser and Kerr, 2009; Glaeser et al., 2009). There is also some evidence that the number of entrepreneurs increases in regions with greater number of small firms (Braunerhjelm, 2010). In addition, Rosenthal and Strange (2009) have found a positive and significant correlation between the number of existing establishments in a region and the growing number of new firms. Moreover, Bygrave

²⁵ According to the entrepreneurship literature, regional entrepreneurial culture is identified as the rate of existing entrepreneurship or the number of existing entrepreneurs (or the amount of young, small and new firms) in a region (Mueller, 2006).

and Minniti (2000) demonstrate that when the rate of new business formation increases, the likelihood of the subsequent persons starting a new firm also will rise.

Based on these arguments, it is put forward that regions with long-established entrepreneurial traditions have a competitive advantages and good economic performance, and therefore they attracted potential entrepreneurs to establish new companies and have high levels of new business formations (Audretsch and Fritsch, 2002; Audretsch and Keilbach, 2004; Mueller, 2006). Similarly, Verheul et al. (2001) find that because high level of entrepreneurial activity move society to a more entrepreneurial culture and successful entrepreneurs are seen as role models, the presence of entrepreneurship in a region lead to the creation of entrepreneurial intentions in such regions. Hence, one can say that peer effects and role models can encourage individuals to launch new firms, referring high level of entrepreneurial dynamics in a region.

To sum up, the findings and arguments mentioned above show that cultural characteristics of a region may determine the level of regional entrepreneurial activity. While regions with entrepreneurially conducive culture attract creative people and potential entrepreneurs and stimulate the formation of new businesses, regions with non-entrepreneurial culture may prevent the entrepreneurial intentions and negatively associate with the level of entrepreneurial activity. Therefore, although the relationship between culture and entrepreneurship is complex (Verheul et al., 2002), one can say that culture may have a (positive or negative) influence on the level of entrepreneurial activity in regions.

Besides, as indicated here, entrepreneurial culture is positively associated with the subsequent entrepreneurial activity. Because the presence of entrepreneurship in a region provides new opportunities, creates conducive environment and offer role models to individuals who have entrepreneurial intention, entrepreneurial culture, in general, has a positive impact on new business formation. In addition, through entrepreneurial culture a positive public attitude towards entrepreneurship and the social acceptance of them will arise that increase the likelihood of individuals becoming self-employment or starting a business. Thus, higher levels of entrepreneurial activity in the past may

stimulate the next new business formation. Therefore, it could be argue that there is a positive relationship between entrepreneurial culture and high level of regional entrepreneurial activity.

Summary

Although some regions or countries have same level of economic development, there are considerable differences in the level of entrepreneurial activity and new business formation in these areas. In this respect, this section has aimed to explain the factors determining these differences in the levels of regional entrepreneurial activity by certain regional characteristics. Depending on their characteristics and roles in regional entrepreneurial activity, these regional characteristics have been categorized into four different sub-sections (See Table 3.1).

Firstly, the impact of regional resources on regional entrepreneurial activity has been examined. In this sense, the theoretical and empirical literature demonstrated that population density, by providing diverse economic advantages and supplying more convenient incumbent conditions for entrepreneurs, has a positive effect on new business formation. In contrast, due to fierce competition, high costs of entry and less room for innovative-driven differentiation in densely populated areas, population density may have a negative effect on regional entrepreneurial activity. Besides, the literature argued that regions rich in population between the ages of 20-40 may have greater rates of start-up activities. It is also indicated that due to having less work experience and professional expertise, financial capital, and difficulties in reaching resources women mostly have lower propensity to launching a new business than men, and thus regions with higher rates of female population may have lower level of entrepreneurial activity. Moreover, the studies indicated that because immigrants are able to take more risks, use efficiently their minority community networks, which help them to access to resources, technologies and financial capital, and have strong solidarity, have higher level of entrepreneurial propensities and skills, reflecting that regions with higher share of immigrants may have higher level of entrepreneurial activity. Through allowing individuals to develop their abilities, to introduce innovations into the market, and to perceive new business opportunities, education has positively

influenced the entrepreneurial capability of individuals that contributes to the entrepreneurial activity in a region. Similarly, as a stimulus of the entrepreneurial activities and innovation processes, human capital is positively related to high level of new firm formation in a region. Scholars also suggested that because the availability and accessibility of financial capital is crucial for individuals who have entrepreneurial intentions regions with higher level of financial capital, are more likely to have higher rate of individuals having engaged in start-up activities. Furthermore, the studies demonstrated that through facilitating the dissemination knowledge between economic actors, the accessibility of resources, cooperation and coordination for mutual benefits, social has been considered as an essential determinant of economic development and driver of entrepreneurship, and thus it has positive relationship with regional entrepreneurial activity.

Secondly, the nexus between economic structures of regions and the level of regional entrepreneurship has been explored. Within this framework, the literature showed that because higher levels of incomes are strongly associated with a greater demand for new products and services and the more capacity of spending and a greater supply of inputs, it has positive influence on regional entrepreneurial activity. Likewise, it is argued that due to having rich and diverse labour pool, input-output linkages, and knowledge spillover and innovative activities, clusters/industrial agglomerations have a substantial positive impact on regional entrepreneurship. However, some researchers argued that due to more intense competition on same inputs, outputs and markets the impacts of clusters/industrial agglomerations on regional entrepreneurship can be negative. The findings also demonstrated that since inter-firm networks created an environment that stimulates the flow of diverse information and resources, it contributed to the start-up activity in such areas. In a similar vein, the findings indicated that because underexploited knowledge generates new business opportunities in regions and triggers the formation of new businesses in these areas, entrepreneurs have a tendency to locate close to the source of knowledge. Thus, it is highly probable that regions with higher level of knowledge capacity and investments have higher level of start-up activity. Moreover, there is a positive relationship between the share of employment in small firms and high levels of entrepreneurial activity. Furthermore, it is demonstrated that

regions with higher share of employment in the service sector and private sector should have higher level of regional entrepreneurial activity than regions with higher share of employment in manufacturing sector and public sector.

Thirdly, the importance of institutional arrangements for regional entrepreneurship has been demonstrated. The literature has revealed that while good institutional arrangements have a positive effect on regional economic development and start-up activities, weak institutional arrangements negatively affect. Institutions, through providing financial resources and education/training services, promoting scientific research and making important legal arrangements, have a crucial impact on regional entrepreneurship. Besides, as the important dimensions of institutions regulation and taxation play a crucial role in determining the level of regional entrepreneurial activity. The literature indicated that because the factors like costs, time and the number of procedures have an effect on individual decision to start new businesses; it is likelihood that the heavier administrative and regulatory burdens have negatively influenced the level of start-ups activities in a region. Similarly, it is indicated that because higher tax rates enhance the entry costs they have negative effect on the level of new business formations in regions. In this regard, the relation between institutional arrangements and entrepreneurship is complex, and especially varies depending on the quality of institutions, regulation and the governance.

Finally, the effects of cultural characteristics and social capital of region on the levels of regional entrepreneurship have been investigated. The findings and arguments in the literature have shown that regions with entrepreneurially conducive culture can stimulate creative and potential entrepreneurs to launch a business, whereas region with non-entrepreneurial culture may negatively affect entrepreneurial intentions and new business formation. Similarly, researchers put forward that lack of or presence of entrepreneurs in a region play a significant role in the subsequent entrepreneurial activity. In other words, it is argued that presence of high levels of entrepreneurship, referring a favourable environment and role models for potential entrepreneurs, in a region are positively associated with high levels of new business formation.

Table 3.1: A summary of the certain regional characteristics that affect the levels of regional entrepreneurship (positively, negatively, or both)

Regional Characteristics	Effect	Sources
Resources of the regions		
Population	- /+	Florida (2003); van Stel and Suddle (2008); Reynolds et al. (1994); Armington and Acs (2002); Fritsch and Schroeter (2009, 2010, 2011)
Age	Population between the ages of 20-40 have a positive impact on regional entrepreneurial activity	Arenius and Minniti (2005); Levesque and Minniti (2006); Hessels et al. (2008); Parker (2009) Álvarez-Herranz et al. (2011)
Gender	The higher rates of women may negatively affect the rates of regional entrepreneurial activity	Sternberg (2012); Carter (1997); Verheul and Thurik (2012); OECD (1998b)
The share of immigrants	+	Bates (1997); Borooah and Hart (1999); Verheul et al. (2002); Vivarelli (2013);
Education	+	van der Zwan et al. (2013); Verheul (2002); Naude' et al. (2008); van Stel, and Suddle (2008); Armington and Acs (2002, 2004); Acs and Armington (2004)
Human capital	+	Becker (1975); Coleman (1988); OECD (1996); Maskell and Malmberg (1999); Dakhli and de Clercq (2004); Urbano and Turró (2013)
Finance Capital	+	Kim, Aldrich, and Keister (2006); Kalantaridis and Bika (2006); Taylor (2006); Bettignies and Brander (2007); Müller, (n.d.); Cetindamar et al. (2012)
Social Capital	+	Malecki (1998); Dakhli and de Clercq (2004); Karlsson (2012); Larsson (2012); Baumgartner et al. (2013)

Table 3.1: Continued

Economic structures of the regions		
Demand for new goods and services	+	Shane (1993); Reynolds, Storey, and Westhead (1994); Bergmann (2011); Audretsch (2012); Minniti et al. (2006)
Cluster and Industrial Agglomeration	- /+	Rosenthal and Strange (2001); Minniti (2005); Delgado, Porter and Stern (2010); Braunerhjelm (2010); Knoben, Ponds and van Oort (2011)
Network	+	Andersson (1985); Malecki and Poehling (1999); Fischer and Nijkamp (2009); Koo and Cho (2011)
Underexploited Knowledge	+	Carlsson et al. (2007); Audretsch and Keilbach (2007); Bishop (2012); Qian, Acs and Stough (2013)
The share of employment in small firms/businesses	+	Lazear (2004); Lin et al. (2000); Fritsh and Falck (2007); Acs and Megyesi (2009)
The rate of employment in service and manufacturing sectors	the higher regional share of employment in the service sector should have a positive effect on regional entrepreneurial activity, but this is not valid for manufacturing sector	Bates (1995); Fritsch, (1997); Tamasy (2006); Fritsch, Brix, and Falck (2006); Brix and Grotz (2007); Acs, Desai and Hessels (2008); Kibler (2013)
The rate of employment in public and private sectors	the higher regional share of employment in the private sector should have a positive effect on regional entrepreneurial activity, but this is not valid for public sector	Brenner and Fornahl (2008); Fotopoulos and Spence (2001); Lundström and Stevenson (2005); Sørensen (2004); Torrini (2005); Kibler (2013)
Institutional structures of the regions		
Institutions	- /+	North (1990); Baumol (1990); Williamson (1998); Autio (2007); Acemoglu, Agion and Zilibotti (2007); Acs and Amorós (2008);
Regulation	- /+	de Soto (1990, 2003); Begley et al. (2005); Bosma and Schutjens (2011); Urbano and Turró (2013); Kaufmann et al. (2006)

Table 3.1: Continued

Taxation	- /+	Gordon (1998); OECD (1998a); Davis and Henrekson (1999); Verhul et al. (2002); Hansson (2008)
Cultural characteristics of the regions		
Regional Culture	- /+	Schwartz (2004, 2008); Hofstede (2003); Inglehart (1997); Wennekers (2006); Williams and McGuire (2010); Ma and Todorovic (2012); Sautet and Kirzner (2006); Florida (2004)
Entrepreneurial Culture	+	Feldman (2001); Audretsch and Keilbach (2004); Mueller (2006); Glaeser and Kerr (2009); Audretsch et al. (2010);

CHAPTER 4

EMPIRICAL STUDIES ON ENTREPRENEURSHIP AND ECONOMIC DEVELOPMENT

In recent years, policy makers and researchers have paid considerable attentions on the role of entrepreneurship in the economic development. The importance of entrepreneurship for the economic development in terms of growth, employment creation and innovation is widely recognized. In the previous chapters the link between entrepreneurship and economic development has been theoretically discussed in detail. However, in this chapter, the main focus on the empirical evidence of the theoretical discussions related to the effects of entrepreneurship on regional or national economic development. In parallel to previous chapter, the first section provides the empirical evidence of the contribution of entrepreneurship on economic and employment growth, innovation, knowledge spillover and competitiveness. Additionally, the evidence related to the impacts of informal self-employment on regional or national economic development has been illustrated in this section. The second section has focused on the empirical evidence on the diverse effects of entrepreneurship on economic development. The empirical literature has described the key factors causing this difference as the types and/or characteristics of entrepreneurship and economic development stage of regions/countries. The last section assesses the results of empirical studies that examine the impact of certain regional characteristics on regional entrepreneurship.

4.1. The empirical evidence on the impacts of entrepreneurship on economic development

This sub-section evaluates the empirical results of the studies that have focused on the contributions of entrepreneurship on regional economic growth, employment creation,

innovation, and knowledge spillovers. In addition, there are some empirical studies examining the impact of the informal self-employment on regional economic development.

4.1.1. Economic growth and productivity contributions of entrepreneurship

The empirical studies in this section have aimed to investigate the contributions of entrepreneurship on economic development and growth. The economic growth are measured by a county's, region's or a country's gross domestic product (GDP), GDP growth rate, total factor productivity (TFP), the changes in GDP per capita, and annual value added growth rates. The studies have been conducted at diverse levels such as at country, state, regional, district, county, and even at the sectoral level. These studies due to using a variety of approaches on the relationship between new business formation (entrepreneurship) and economic development and growth have found contradictory results. While the majority of the studies found a positive link between a higher level of entrepreneurship and an increase in GDP per capita, some of them investigated insignificant and even negative relationship between entrepreneurial activity and economic growth, especially in developing and underdeveloped economies. The studies have been summarized in Table 4.1.

Blanchflower (2000), in this respect, conducted a study to examine the role of and impact of self-employment on national economic growth across the 23 OECD countries. Using time series data in the period 1966 and 1996 and regressed the real GDP growth rate, changes in the self-employment and in the number of employees within the frame of Cobb-Douglas production function, he found that self-employment has led to a lower not higher the real GDP growth in OECD countries during this period.

Similar to Blanchflower (2000), Audretsch and Thurik (2001) conducted a study to explore the influence of changes in entrepreneurship on economic growth across the 18 OECD countries in the period 1974 and 1998. Using panel data of the countries, however, differently from Blanchflower (2000), they investigated that those countries that have higher rate of business ownership have experienced high level of economic growth and low level of unemployment.

Moreover, like the above studies Carree et al. (2002) conducted a study across 23 OECD countries from 1976 to 1996. They addressed the relationship between self-employment and economic development at the country level. In this study they focused on three main issues. The first was about the relationship between the equilibrium rate of business ownership and the stage of economic development. The second was about the speed of convergence towards an equilibrium rate when the business ownership rate is not at the equilibrium level. The last was to demonstrate to what extent does deviating from equilibrium rate of business ownership impedes economic growth. With this framework, they used panel data of these countries with a two-equation model. While the first equation was undertaken to find the reasons of changes in the business ownership rate, the second equation examined the impacts of these changes. The results indicated that deviations from the equilibrium rates of business ownership significantly and negatively affected GDP growth. In other words, the authors argued that a shortage of and a glut of self-employment have detrimental effects on the competitiveness and efficiency of national economy. In this regard, they have found a U-shaped relationship between business ownership and GDP per-capita. Thus they concluded that low barriers to the birth and death of firms were required for the equilibrium that is a vital mechanism that provides economic development.

Using a sample of 45 countries for the period 1990 and 2000, Beck, Demirguc-Kunt, and Levine (2005) examined the influence of small and medium enterprises (SMEs) sector on poverty alleviation and economic growth across diverse countries. They used a database on the share of SME labour in the total manufacturing sector of the countries as the proxy of entrepreneurship. Together with SMEs variable, there are several policy variables were included in the growth model such as the share of credit to private sector in GDP, inflation rate, share of foreign trade and of government expenditures in GDP and business environment variables. The ordinary least squares (OLS) regression was used and the findings indicated that higher rates of SME employment in total manufacturing employment were strongly associated with faster growth in GDP per capita. However, they found no evidence regarding the positive effect of SMEs on poverty alleviation and income disparity.

Based on the comprehensive dataset of World Bank (125 countries), the OECD (covering 24 countries), and the Compendia (containing 13 countries), Cumming et al. (2014) undertook a study to find the impacts of entrepreneurship on GDP per capita, unemployment, exports and the number of patents across countries. Through these datasets the authors compared the results of the analysis. Using panel data for the period 2004 to 2011, the results revealed that depending on the World Bank and the Compendia dataset, entrepreneurship has a significantly positive impact on GDP per capita, exports and the number of patents, and a negative impact on unemployment. However, the findings from the OECD data did not support any of these results.

Conducting a regional level study, Acs and Armington (2004) analyzed the relationship between knowledge externalities and economic growth with a particular emphasis on entrepreneurship and its role in the dissemination of knowledge. Entrepreneurship variables are constructed from data of the new-firm birth rate in each of these local economies. The study used the longitudinal dataset of 394 regions in the U.S. from 1989 to 1996. The findings demonstrated that higher levels of entrepreneurial activity (with the exception of the manufacturing sector) are positively and significantly associated with higher economic growth and employment rates.

In a similar vein, Audretsch and Keilbach (2004) conducted a study to investigate the contribution of entrepreneurship in terms of start-up rate on the regional economic development across 327 regions of Western Germany for the period of 1989-1992. The researchers added a new factor –entrepreneurship capital- into the Cobb-Douglas production function. Using cross-section data of these regions in the regression analysis, they found a positive relationship between the degree of entrepreneurial capital (the number of start-ups) and GDP growth in regions of Western Germany. Based on this finding, they suggested a new direction for policy makers to develop new instruments for stimulating entrepreneurship capital.

Table 4.1: Empirical evidence on the economic growth contribution of entrepreneurship

Study	Level	Sample	Variables	Entrepreneurship	Main Findings
Blanchflower (2000)	Country	23 OECD countries, From 1966 to 1996	Dependent Variable: real GDP growth rate Independent Variables: changes in the self-employment rate; changes in the number of employees (labour input); capital (constant); and country dummies.	The rate of self-employment in total employment	Self-employment has produced lower not higher the real GDP growth.
Audretsch and Thurik (2001)	Country	18 OECD countries, From 1974 to 1998	Dependent Variable: the actual rate of economic growth Independent Variables: changes in the rate of entrepreneurship; country dummies and time dummies.	Small firms and self-employment rate	Higher rate of business ownership is positively associated with high level of economic growth and low level of unemployment
Carrée et al. (2002)	Country	23 OECD countries, From 1976 to 1996	Dependent Variable: The changes in gross domestic product per capita (GDPpc) Independent Variables: the deviation of the actual number of self-employment from the equilibrium rate of business ownership; the initial GDPpc (control variable)	Self-employment or business ownership	There is a U-shaped relationship between business ownership and GDP per-capita.
Beck et al. (2005)	Country	45 countries, From 1990 to 2000	Dependent Variable: GDP per capita growth Independent Variables: Initial income; SME250; Education; Govt. expenditures; Trade; Inflation rate; Black market premium; Private credit; and Business Environment	The share of SME employment	There is a positive and statistically significant relationship between SMEs and countries' economic growth.
Cumming et al. (2014)	Country	125 World Bank, 24 OECD, and 13 Compendia countries, From 2004 to 2011	Dependent Variable: GDP per capita; exports/GDP; Unemployment; and Patents per 1000 population Independent Variables: The rate of entrepreneurial activity, Birth rate, and Entry rate; MSCI returns; Strength of creditor protection; Cost of exports; and Uncertainty avoidance.	New density (World Bank), Birth rate (OECD), Entry rate (Compendia)	According to World Bank and Compendia data, entrepreneurship positively affected economic growth, but this is not valid for OECD data.

Table 4.1: Continued

Study	Level	Sample	Variables	Entrepreneurship	Main Findings
Acs and Armington (2004)	Regional	394 regions in the U.S., From 1989 to 1996	Dependent Variable: Average annual employment growth rate Independent Variables: Entrepreneurial activity ; Business specialization and density; Establishment size; Share of Proprietors; and Human Capital.	New firm birth rate; the share of business owners.	Higher levels of entrepreneurial activity are positively and significantly associated with higher economic growth and employment rates.
Audretsch and Keilbach (2004)	Regional	327 West Germany Region, From 1989 to 1992	Dependent Variable: Output (Gross Domestic Product (GDP)) Independent Variables: Physical capital; Labour; Knowledge capital; Entrepreneurship capital.	The number of start-ups	A positive relationship between the degree of entrepreneurial capital (the number of start-ups) and GDP growth.
Beugelsdijk and Noorderhaven (2004)	Regional	54 regions in 13 European countries, From 1950 to 1998	Dependent Variable: GDP per capita Independent Variables: Initial level of welfare (GRP); Investment ratio; School enrolment ratio; spatial auto-correlation (spillover) and human capital; Entrepreneurial capital.	Self-employment or business ownership	Higher degree of entrepreneurial characteristics was positively correlated with high regional economic growth rate.
Camp (2005)	Regional	394 regions in the U.S., From 1990 to 2001	Dependent Variable: Productivity Growth Independent Variables: Income growth; Percent of employment in manufacturing sectors; and Firm births rates	The number of new firm births	Entrepreneurship contributed to regional economic development.
Cravo et al. (2012)	Regional	25 Brazilian regions, From 1985 to 2004	Dependent Variable: GDP per capita Independent Variables: Initial GDP per capita; SMEs activity (the relative size of SME sector and human capital of SME sector).	The share of SME employment in total formal employment	SME sector is negatively associated with economic growth.
Rupasingha and Goetz (2011)	County	3000 U.S. counties, From 1970 to 2000	Dependent Variable: GDP pc; Employment Growth; and Family Poverty Rate Independent Variables: Initial GDP pc, employment level and family poverty level; Self-employment; Educational; Govt. spending; The percentage of non-white population; Population density; and Industrial employment share.	The number of self-employment	There is a positive and statistically significant relationship between higher rates of self-employment and reductions in poverty rates, and increases in income and employment growth in non-metro counties.

Using 54 European regions, Beugelsdijk and Noorderhaven (2004) examined the nexus between entrepreneurial attitude and economic growth. They tried to explain whether regions known as entrepreneurial grow faster than the regions that have lower level of entrepreneurial activity. In this context, they empirically set up a link between culture and economy at the regional level. The researchers used data on European Values Studies (EVS) for the period between 1950 and 1998 and measured entrepreneurship as the rate of self-employment. The empirical study based on "Barro" type of a growth regression revealed that the differences in the entrepreneurial characteristics played a crucial role in explaining the variations in the growth rate across regions. The authors suggested that higher degrees of entrepreneurial characteristics were positively correlated with high regional economic growth rate.

In another study, Camp (2005) examined the connection between innovation and entrepreneurship and tried to understand their role in regional economic growth. The study measured entrepreneurship as the firms' births rates and used panel data of 394 regions in the U.S. for the period between 1990 and 2001. Similar to the study conducted by Acs and Armington (2004) for the same regions, this study also found that higher degree of regional firm births (entrepreneurship) is positively associated with higher level of regional economic growth and innovation. Moreover, the findings indicated that most entrepreneurial regions in the U.S. have 109 percent higher productivity, 58 percent higher wage, and 125 percent higher employment growth.

In contrast to the above studies which are at regional level, the study conducted by Cravo et al. (2012), who examined the relationship between the small and medium-sized enterprise (SME) sector and economic growth for an annual panel of Brazilian regions for the period 1985–2004, demonstrated that SME sector is negatively associated with economic growth. Cravo et al. (2012) argued that the result is consistent with previous studies undertaken for developing countries. Authors also claimed that as compared to the relative size of the SME sector, human capital embodied in SMEs may be more important for economic growth.

Besides these studies, Rupasingha and Goetz (2011) conducted a study at the county level. The researchers investigated the influences of self-employment on poverty

alleviation, employment growth and economic growth within metro and non-metro counties of the U.S. for the period between 1970 and 2000. Using panel data of 3000 U.S. counties and different econometric models such as fixed effect model (FEM) and spatial Durbin Model (SDM), the findings indicated that there is a positive and statistically significant relationship between higher rates of self-employment and reductions in poverty rates, and increases in income and employment growth in non-metro counties. Authors also argue that similar effects on employment and income growth have been observed in metro counties, but not for poverty alleviation.

As a result, at the country level, the empirical studies have demonstrated diverse results. While the impact of entrepreneurship on national economic development mostly positive and statistically significant for developed economies, this relation generally negative or insignificant for developing and transition economies. Several researchers have linked the causes of these various results to the empirical analysis conducted with different data and within different period of time. Moreover, as a multidimensional concept, different definitions of entrepreneurship may result in these diverse results.

The studies at the regional level also revealed different results. Similar to the studies at the country level, the regional-level studies found a positive link between a higher level of entrepreneurship and economic growth in the regions of developed countries such as Germany, the Netherlands, and the U.S., whereas a negative link in the regions of developing countries such as Brazil. In particular, the results showed that the impact of new business formation on regional economic growth are more pronounced in regions with higher rate of service sector.

4.1.2. Employment contributions of entrepreneurship

The sub-section has aimed to review the recent empirical evidence of the relative contributions of entrepreneurship on employment creation based on aggregated or disaggregated data. The empirical studies on the creation of employment can be divided into categories according to their level of analysis such as at district, regional or country level. The studies in this section have also arrived at diverse results and used different methods as in the following samples (see Table 4.2).

At the country level, Thurik et al. (2001) conducted a study to examine the dynamic relationship between self-employment and unemployment across 23 Organization for Economic Cooperation and Development (OECD) countries, over the period of 1974 to 2002. The authors argued that on the one hand, as unemployment rates rise, individual with low prospect for employment alternatives may be pushed into self-employment that results in positive relationship between unemployment and entrepreneurship (refugee effect). On the other hand, greater rates of entrepreneurship can lead to future increases in new jobs, thus reducing the rates of unemployment in the long-run (entrepreneurial effect). The study used a new two-equation vector autoregression model for measuring the impacts of changes in the number of self-employment and in unemployment on the subsequent changes in those variables. The results indicate that the relationship between self-employment and unemployment can be both positive and negative. In other words, there is a Granger causality for both the 'entrepreneurial' effect and the 'push' effect. Changes in the degree of self-employment negatively affected subsequent unemployment rates, whereas at the same time, changes in unemployment rates have a significant positive effect on subsequent changes in the rates of self-employment. According to the findings, the former effect is considerably stronger than the latter one.

Audretsch and Fritsch (2002) also examined the relationship between entrepreneurship, measured by new firm formation, and regional economic development in terms of employment generation across 74 Western Germany regions for the period between 1983 and 1998. The study indicated that while the changes in the start-up rates in the 1980s could not explain changes in employment rates in the 1980s, could contribute to the explanation of employment change in the 1990s. This finding led to the researchers to suggest that the impacts of start-ups on employment growth become more visible in the long-term. In this regards, they concluded that the long term employment effect of start-up activity is positive and also indirect.

Another study used employment growth as the dependent variable was conducted by Van Stel and Storey (2004), using the Almon polynomial lag procedure to estimate a time lag structure of the impacts of new firm formation on regional employment creation in Great Britain. The study used firm birth rates as the proxy of entrepreneurship and used panel data of 60 British regions over the period from 1980 to

1998. The results showed that there is no significant relationship between start-up activity and employment growth in the 1980s for England, but a negative relationship for Wales and Scotland. In contrast, the authors found a significant positive relationship in the 1990s for the whole Great Britain, but again a negative relationship for Scotland. These results confirmed time-lags between new firm formation and regional employment growth, referring that the entries occurring in the earlier years have positively shaped the employment growth rates of regions. According to the results, there is an inverse U-shaped relationship between start-up activity and employment growth, indicating that firms are generally 5 years old by the time they reach their peak employment.

In a similar vein, Baptista et al. (2008) conducted a study to investigate whether new business formation leads to employment growth in regions of Portugal for the period 1982 to 2002. To estimate this relationship, time lag structure has been used. Using panel data of 30 regions of Portugal, the results of the study supported above findings and demonstrated that the long-term or indirect supply-side effects of new business formation are positively associated with employment growth. According to the authors, such supply-side effects take place about 8 years after firm entry, leading a pattern of lagged effects (U-shape).

Similar to Van Stel and Storey (2004), Mueller et al. (2008) also conducted a study in Great Britain over the period 1981-2003 (almost the same period) to re-examine the relationship between new business formation and job creation across 60 British regions, taking into account the economic development level of regions. Using the Almon polynomial lag procedure and ordinary least squares (OLS) regression, the study revealed that because of the displacement effects, low-enterprise regions (8 of the 15 are Scottish regions and 3 of the 15 are North East regions) lost more employment than high-enterprise regions, and thus the employment effects of new firm formation is significantly negative in the former and positive in the latter. Based on this finding, the authors concluded that the jobs lost in the less prosperous regions may result from a wrong type of entrepreneurship.

Table 4.2: Empirical evidence on the employment contribution of entrepreneurship

Study	Level	Sample	Variables	Entrepreneurship	Main Findings
Thurik et al. (2001)	Country	23 OECD countries, From 1974 to 2002	Dependent Variable: The change in unemployment; The change in self-employment Independent Variables: Lag self-employment; Lag unemployment; and time dummies	Changes in self-employment rates	The relationship between self-employment and unemployment can be both positive and negative.
Audretsch and Fritsch (2002)	Regional	74 Western German regions, From 1983 to 1998	Dependent Variable: Regional employment change Independent Variables: Start-up rate; Population density; Average sector adjusted start-up rate (1983-85, 1993-95)	Start-up rate; Exit rate; Turbulence rate; Net entry rate	The long term employment effect of start-up activity is positive and also indirect.
van Stel and Storey (2004)	Regional	60 Great Britain regions, From 1980 to 1998	Dependent Variable: Regional employment growth Independent Variables: Average Start-up rate; Population density; Wage growth; Lagged employment growth	Firm Birth Rates	There is a significant positive relationship in the 1990s for the whole Great Britain, but again a negative relationship for Scotland.
Baptista et al. (2008)	Regional	30 regions of Portugal, From 1982 to 2002	Dependent Variable: Change in regional employment Independent Variables: Firm birth rates (for 10-year period)	Start-up rate	The indirect supply-side effects of new business formation are positively associated with employment growth.
Mueller et al. (2008)	Regional	60 Great Britain regions, From 1981 to 2003	Dependent Variable: Employment change rate over 2 years Independent Variables: Average Start-up rate; Population density; Hourly wages; Lagged employment change; Spatial autocorrelation	Start-up rate	Low-enterprise regions (8 of the 15 are Scottish regions and 3 of the 15 are North East regions) have lost more employment than high-enterprise regions.
van Stel and Suddle (2008)	Regional	40 regions in the Netherlands, From 1988 to 2002	Dependent Variable: Employment growth Independent Variables: Start-up rate; Population density; Wage growth; lagged employment growth; Spatial autocorrelation	Start-up rate	The immediate employment effects may be small, the overall employment effects of start-up are positive.

Another study undertaken by van Stel and Suddle (2008) for the 40 regions in the Netherlands during the period from 1988 to 2002 also investigated the impacts of new firm formation on regional employment growth, by taking into consideration the differences in time period, sector and the degree of urbanization. Using the same analysis technique with the above study, the authors found that although the immediate employment effects may be small, the overall employment effects of start-up is positive, and new firms reach their peak employment about after 6 years entry. The authors also have found that the employment effect of new business formation is highest in the manufacturing sector. In addition, they suggest that the degree of urbanization has a considerable impact on the employment growth, and thus as compared to the Northern provinces, having lower urbanization rates, the effects of start-ups was greater in the Western side.

As consequence, the empirical studies demonstrated that there is a positive relationship between new business formation and regional employment growth in developed economies. In contrast, as shown in several studies such as Van Stel and Storey (2004) and Mueller et al. (2008) the impact of new business formation on job creation is insignificant or negative for regions in the developing countries. Moreover, the results indicated that the employment effect of new business formation is more pronounced in the manufacturing sector, rather than service sector. Lastly, the researchers described direct and indirect effect of new business formation, referring that the contribution of entrepreneurship on regional employment not only occurs immediately, but also it is separated over a relatively long period of time. Almost all studies detected that the indirect effect of entrepreneurship is considerably stronger than its direct effect. These results leads to the conclusion that to evaluate and to obtain better results, a long-term analysis is crucial for the relationship between new business formation and employment creation.

4.1.3. The contribution of entrepreneurship on innovation and knowledge spillover

This sub-section provides empirical evidence on the relative contribution of entrepreneurship on innovation and on the spillover of knowledge (See Table 4.3).

Using Knowledge Spillover Theory of Entrepreneurship (KSTE), Acs et al. (2009) investigated the influences of knowledge spillovers on new entrepreneurial opportunities across 19 OECD countries for the period between 1981 and 2002. The study used a variety of variables together with R&D expenditure in GDP, and showed that there is a significant positive relationship between knowledge spillovers and entrepreneurial activity. In other words, the authors concluded that knowledge generated but not exploited by incumbents has a significant effect on entrepreneurial activity.

In a similar vein, Acs et al. (2012) conducted a study to explore the role of entrepreneurship in the spillover of new knowledge and economic growth across 18 countries. The study used panel data of these countries for the period of 1981-1998. The authors argued that entrepreneurship serves as a conduit for the spillover and commercialization of knowledge, and thus, it serves to promote economic growth.

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Table 4.3: Empirical evidence on the relative contribution of entrepreneurship on innovation and on the spillover of knowledge

Study	Level	Sample	Variables	Entrepreneurship	Main Findings
AcS et al. (2009)	Country	19 OECD countries, From 1981 to 2002	Dependent Variable: The rate of self-employment Independent Variables: Gross domestic expenditure on R&D; Government expenditure; Personal income tax rate; Corporate income tax rate; Number of patents; Annual GDP/potential GDP; Average growth over five years; Age; The share of population living in urban areas; and Time dummy.	Self-employment rate	There is a significant positive relationship between knowledge spillovers and entrepreneurial activity.
AcS et al. (2012)	Country	18 OECD countries, From 1981 to 1998	Dependent Variable: Economic Development (values of GDP) Independent Variables: Entrepreneurship; The share of R&D expenditure; Education; Government expenditure; Capital stock divided by employment; Age; Unemployment; The share of population living in urban areas; and Time dummy.	Self-employment rate	Entrepreneurship is positively correlated with economic growth and the formation of new businesses.
Galindo and Méndez (2014)	Country	13 developed countries, From 2002 to 2007	Dependent Variable: Economic Growth (GDP per capita growth rate) Independent Variables: Entrepreneurship; Innovation (the numbers of patents); Human capital	Total Entrepreneurship Activity (TEA) index	There is a positive correlation between innovation, entrepreneurship and economic growth in three equations.
Audretsch and Keilbach (2007)	Regional	Regions, From 1998 to 2000	Dependent Variable: Economic performance of region (GDP per capita growth rate) Independent Variables: Entrepreneurship capital; Labour; Physical capital; Knowledge Capital	The start-up rate	New knowledge results in entrepreneurial opportunities and thus stimulates the formation of new businesses.

In this study, Galindo and Méndez (2014) analyzed the relationship between entrepreneurship, innovation and economic growth across 13 developed countries, for the period 2002 to 2007. The study used panel data with fixed effects models that demonstrated that innovation and entrepreneurial activities in a country have positive impacts on economic growth. Similarly, the study found a positive correlation between innovation, entrepreneurship and economic growth in three equations. Thus, the authors concluded that those activities stimulate innovation can also promote economic growth.

Using cross-regional data, Audretsch and Keilbach (2007) examined the role of and importance of entrepreneurship for economic growth in the context of Knowledge Spillover Theory of Entrepreneurship, for the period of 1998-2000. The authors suggested that by serving as a conduit for the spillover of new knowledge, entrepreneurship has been considered as the missing link between investments in new knowledge and economic growth. Using Ordinary Least Square (OLS) regression, the results indicated that new knowledge generates entrepreneurial opportunities, and thus stimulates the formation of new businesses. The authors concluded that knowledge and new ideas are required for the entrepreneurial activity. As a result, entrepreneurship, acting as a mechanism for spatial variation of knowledge between regions, was seen as an essential source of economic growth.

As a result, all the empirical studies investigated a positive link between entrepreneurial activity, innovation, knowledge spillovers, and economic growth. In this framework, by pioneering innovative activities and acting as a conduit for the spillover of and commercialization of knowledge, entrepreneurship has been recognized a vehicle of regional economic development.

4.2. Empirical evidence on ‘Why Do the Effects of Entrepreneurship on Economic Development Differ?’

This sub-section provides the empirical evidence on the variations in the effect of entrepreneurship on economic development. In this respect, firstly, empirical studies examining the relationship between diverse types or characteristics of entrepreneurship and economic development will be evaluated. Secondly, at the end of this section,

studies that empirically analysis the link between entrepreneurial activity and economic development stages of regions/or countries will be investigated.

4.2.1. Empirical evidence on Diverse Types of Entrepreneurship and Its Relation with Economic Development

The empirical studies in this section have focused on the contribution of different types of entrepreneurship on regional or national economic development. The theoretical literature (in the previous chapter) argued that different types of entrepreneurship have diverse impacts on economic development. In this respect, this section aims to support these arguments with empirical evidence (See Table 4.4).

Acs and Varga (2005), in this context, conducted a study to examine the impacts of the variations in the entrepreneurial activity and in the spatial structure of economies across countries on the economic growth and knowledge spillovers. They used cross-national data of 9 European countries for the year of 2001 within a ‘Romerian framwork’ with OLS regression. The entrepreneurship is measured by the total entrepreneurial activity (TEA) index, distinguishing as high-potential, opportunity, and necessity-driven entrepreneurship. The findings showed that while the opportunity and high-potential entrepreneurship have a positive and statistically significant effect on technological change in the European Union, the necessity entrepreneurship and overall entrepreneurial activity have no such effect.

Another study at the country level was performed by Wong et al. (2005) who aimed to investigate the impacts of different types of entrepreneurship (high growth potential, opportunity, necessity, overall TEA) on GDP growth of 37 countries for the year 2002. Similar to Acs and Varga (2005), they used TEA index and indicated that different types of entrepreneurship have different effects on countries' economic growth. In essence, the authors suggest that while high growth potential entrepreneurship has a significantly positive impact on GDP growth, opportunity, necessity and overall TEA has no effect.

Table 4.4: Empirical evidence on the relative contribution of different types of entrepreneurship on regional or national economic development

Study	Level	Sample	Variables	Entrepreneurship	Main Findings
Acs and Varga (2005)	Country	9 European Union countries, For the year 2001	Dependent Variable: New Knowledge (the change in patents applications) Independent Variables: Entrepreneurship; The set of publicly available scientific-technological knowledge; R&D expenditures; and the agglomeration index	The total entrepreneurial activity (TEA) index	While the opportunity-driven and high-potential entrepreneurship have positive effect on technological change the necessity entrepreneurship activity has no such effect.
Wong et al. (2005)	Country	37 countries, For the year 2002	Dependent Variable: Rate of economic growth Independent Variables: Base year GDP per worker; Growth in Capital per worker; New Firm Creation; Technological innovation intensity	Total entrepreneurial activity (TEA) (high growth potential TEA, opportunity TEA, necessity TEA and overall TEA)	While high potential TEA has a significantly positive impact on GDP growth, opportunity, necessity and overall TEA has no effect.
Valliere and Peterson (2009)	Country	44 countries, From 2004 to 2005	Dependent Variable: GDP growth rate Independent Variables: Entrepreneurship (High-expectation, Opportunity, and Necessity Ent.); Population; GDPpc; Initial GDP growth rate; and Foreign direct investment per capita; and Control Variables	High-expectation TEA; Opp. and Nec. Entrepreneurship	Different types of entrepreneurship have different effects on countries' economic growth.
Baptista and Preto (2011)	Regional	30 Portugal regions, From 1983 to 2000	Dependent Variable: Employment change rate over 2 years Independent Variables: Birth rates in different periods for type I and type II start-ups; Population density; Lagged employment change; Average size of the firms.	Start-up rate	While knowledge-based start-ups have a crucial positive effect on regional employment growth, the other start-ups play insignificant or small roles.
Fritsch and Schindele (2011)	Regional	71 regions in West Germany, From 1984 to 2002	Dependent Variable: Short-term and Long-term employment contribution Independent Variables: Start-up rate; Survival rate (for 2 and 10 years); Employment growth of new businesses and incumbents; Small business innovation; High educational level; Short-term unemployment rate; GDPpc; Population density and growth; and Market potential	Start-up rate	The quality of start-ups has greater impact on regional employment than the quantity of start-ups.

Using cross-national panel data of 44 countries for the period of 2004 to 2005, Valliere and Peterson (2009) also examined the influences of different types of entrepreneurship on GDP growth. Similar to above studies, the researchers arrived at a similar conclusion which demonstrated that an essential portion of economic growth rates are achieved through the activities of high-expectation entrepreneurship in developed countries. However, this effect did not occur in emerging countries.

Baptista and Preto (2011) used the longitudinal data of 30 Portugal regions over the period from 1983 to 2000 to examine whether the types of start-ups and types of regions lead to differences in the employment effects of new business formation across regions. Feasible Generalized Least Squares (FGLS) was employed using employment change as the depended variable regressed against independent variables including start-up rates, population density, lagged employment change, and size of the firms. The results showed that as compared to regions with low level of labour productivity, the employment effects of start-ups are greater in highly agglomerated and in high-labour productivity regions. The results also indicated that while knowledge-based start-ups have a crucial positive effect on regional employment growth, the other start-ups play insignificant or small roles.

Similarly, Fritsch and Schindele (2011) undertook a study at the regional level to explore regional differences in the effects of new business formation across 71 Western Germany regions for the period of 1984-2002. Using panel data of the regions with a random-effects panel regression, the study found pronounced disparities for the employment contribution of new firms across regions. The authors also claimed that the level of new business formation in a region can explain only a part of employment effect. Thus, they concluded that the quality of start-ups has greater impact on regional employment than the quantity of start-ups. Moreover, the findings indicated that high level of innovative activities in small firms in a region, a high regional educational level and the presence of a rich and diverse labour pool have a significant and positive employment effect.

As a result, the empirical findings demonstrated that types of entrepreneurship and regions/nations played crucial role in determining the impact of new business formation

on economic and employment growth and innovation activity. Roughly, according to the studies, entrepreneurship which is knowledge-based, innovative, formal, high potential, and opportunity- driven are positively associated with economic development, whereas those are non-innovative, non-productive, necessity-driven, and informal have a negative link with economic development.

4.2.2. Empirical evidence on the relationship between entrepreneurship and economic development stages

The sub-section has an attempt to review the empirical studies that examine the relationship between entrepreneurial activity and the economic development level of regions and countries. Based on entrepreneurship literature, as discussed in the previous chapter, the effect of entrepreneurial activity in terms of gross regional product (GRP) may differ across regions/countries due to the economic development stage of them (See Table 4.5).

In this respect, van Stel et al. (2005) conducted a study to investigate whether entrepreneurial activity, characterized as the Total Entrepreneurial Activity (TEA), has a similar effect on economic growth, measured as GDP growth, both in highly developed and in less developed economies (across 36 countries) over the period of 1999-2003, taking into consideration the economic development level of countries. The study used cross-national data with regression analysis and indicated that while the TEA negatively affected the GDP growth of poor countries, it had a positive impact on economic growth of rich countries. Thus, the authors concluded that entrepreneurship may play different roles in countries at different level of economic development (i.e., it is highly probable that in developing countries, the majority of business owners are shopkeepers, whereas in developed countries, most of them are Schumpeterian entrepreneurs).

Another cross-country analysis was performed by Wennekers et al. (2005) who examined the relationship between the rate of entrepreneurial dynamics and the level of economic development for the year 2002 in a sample of 36 GEM countries. The study used nascent entrepreneurship as the dependent variable and the level of economic development, measured by per capita income and innovative capacity index, as the main independent variables together with several other variables.

Table 4.5: Empirical evidence on the relationship between entrepreneurial activity and the economic development level of regions and countries

Study	Level	Sample	Variables	Entrepreneurship	Main Findings
van Stel et al. (2005)	Country	36 GEM countries, From 1999 to 2003	Dependent Variable: Growth of GDP Independent Variables: Total Entrepreneurial Activity; Per capita income; Growth competitiveness index	Total entrepreneurial activity (TEA) (nascent entrepreneurs and owner/managers of young businesses)	While the TEA negatively affects the GDP growth of poor countries, it has a positive impact on economic growth of rich countries.
Wennekers et al. (2005)	Country	36 GEM countries, For the year 2002	Dependent Variable: Nascent rate Independent Variables: Per capita income; Innovative capacity index; and several control variables	Total entrepreneurial activity (TEA); nascent entrepreneurship	There is a U-shaped relationship between countries' rate of entrepreneurial activity and their stages of economic development.
Stam and van Stel (2009)	Country	36 GEM countries, From 2002 to 2005	Dependent Variable: Average annual GDP growth (2002-05) Independent Variables: Entrepreneurship in rich, transition, and poor countries; Growth competitiveness index; Lagged GDP growth; and Gross national income per capita (2001)	The Young Business (YB) indicator	As compared to transition and high-income countries where entrepreneurship has a significantly positive effect, it has no growth effect in low income countries.
Amorós et al. (2011)	Country	Latin American countries, From 2001 to 2006	Dependent Variable: Countries with a per capita GDP income lower than a US\$3,000; Countries with a per capita GDP income between US\$6,000 and US\$9,000; and Countries with a per capita GDP income higher than a US\$9,000 Independent Variables: Rate of (Opp. and Nec.) entrepreneurship; Factor 1 (enterprising, efficiency and innovation factor); Factor 2 (variables related to stability and practices within the private and public sector); Factor 3 (financial sector and government expenditures in science and tech.); Factor 4 (variables linked to macro-economic stability)	The total entrepreneurial activity (TEA); Opportunity and Necessity Entrepreneurship rate	Latin American countries need to transform their typical self-employment and/or less effective new firms in local markets into innovative, powerful, and competitive initiatives/firms acting on global scale.

The results in this study suggest a U-shaped relationship between countries' rate of entrepreneurial activity and their stages of economic development. In this respect, the authors supposed that the most developed countries should develop a mechanism that stimulates the formation of new business and facilitates the commercialization of scientific discoveries, and however, developing countries may find the ways of exploiting of scale economies and support foreign direct investment (FDI).

Similar to above two studies, Stam and van Stel (2009) examined the impacts of entrepreneurship on economic growth across high-income, transition, and low-income countries (36 GEM countries), over the period of 2002-2005. Using aggregated data with the OLS regression, the study indicated that as compared to transition and high-income countries where entrepreneurship has a significantly positive effect, it has no growth effect in low income countries. In particular, growth-oriented entrepreneurship has a pronounced positive influence in the transition countries.

Using cross-national data of Latin American countries from 2001 to 2006, Amorós et al. (2011) empirically examined the nexus between a country's entrepreneurial dynamics and their competitiveness rates. The results demonstrated that to strengthen the dynamics of entrepreneurship and to achieve economic development and competitiveness, Latin American countries need to transform their typical self-employment and/or less effective new firms in local markets into innovative, powerful, and competitive initiatives/firms acting on global scale.

As a result, the studies indicated that the relative contribution of entrepreneurship on economic development/growth vary across countries depending on their economic development level. While the impact of entrepreneurship or new business formation on economic development was positive in developed or transition countries, there was no such effect in developing countries. In other words, the studies found a U-shaped relationship between the level of entrepreneurship and economic development levels of regions or countries.

4.3. Empirical Evidence on the Impact of the Certain Regional Characteristics on Regional Entrepreneurship

This section provides empirical evidence on the impacts of the certain regional characteristics on regional entrepreneurship. In this respect, these regional characteristics are categorized into five sub-sections. In the first-sub section, the empirical studies based on the influence of the population composition on regional entrepreneurial activity are examined. The second sub-section provides empirical evidence on the connection between (regional) resources and the formation of new firms. The third sub-section investigates the empirical results regarding the influence of economic structure of the regions on regional entrepreneurship. In the forth sub-section evidence on the impact of institutional structure of the regions on regional entrepreneurial activity is demonstrated. In the final-sub section, empirical studies investigating the effect of culture on regional entrepreneurship are reviewed.

4.3.1. Empirical evidence on the regional population composition

This sub-section provides empirical evidence on the regional population composition, including population density, age, and gender (See Table 4.6).

At the country level, the study conducted by Arenius and Minniti (2005) examined the variables that are influential on the individual's decision to start a new business. In this respect, the study focused on the perceptual variables such as alertness to opportunities, fear of failure and confidence about one's own skills, and the presence of role models, playing crucial role on individual decisions. Besides, the authors link such a decision to economic and demographic characteristics (education, age, wealth, etc). Using aggregated data of 28 countries for the year of 2002 with the binominal logistic regression models, the study found that perceptual variables are positively associated with new firm formation across gender and across all countries in the sample. Also the likelihood of starting a new business decreases with age. The findings showed that male have more propensity than female to be nascent entrepreneurs. Further, the probability of being nascent entrepreneurs is positively correlated with higher levels of education.

Table 4.6: Empirical evidence on the regional population composition

Study	Level	Sample	Variables	Entrepreneurship	Main Findings
Arenius and Minniti (2005)	Country	28 countries, For the year 2002	Dependent Variable: Nascent entrepreneurs Independent Variables: Knowing other entrepreneurs; Fear of failure; Confidence in one's skills; Opportunity perception; Household income; Education; Work status; Gender; Age; and Country dummy	Nascent entrepreneurs	Male have more propensity than female to be nascent entrepreneurs.
van der Zwan et al. (2012)	Country	36 countries, From 2009 to 2010	Dependent Variable: Start-up considerations of individuals Independent Variables: Male; Age; Education; Self-employed father and/or mother; Urban vs rural; Risk tolerance; Optimism; and Perception administration complexities, insufficient info, and financial constraints	The five different stages of entrepreneurial processes	The propensities of women to convert start-up ideas into start-up activities are relatively smaller than men.
Fritsch and Schroeter (2011)	Regional	Regions in the Western Germany, From 1980 to 2002	Dependent Variable: The average employment change (2-year period) Independent Variables: Average start-up rate; Entrepreneurial technological regime; The presence of small firms; Labour Productivity; Long-term and short-term unemployment rate; The rate of R&D employment; Educational level (medium or high); Population density; and Time dummies	Start-up rates	Population density has the greatest effect on entrepreneurial activity.
Gaygisiz and Köksal (2003)	Province	58 provinces in Turkey, From 1985 to 1990	Dependent Variable: The firm birth rate (in accordance with the labour market and ecological approach) Independent Variables: Demand-side; Supply-side variables; and Policy variables	Firm birth rates	The highly populated regions, which are more prosperous, have relatively high level of firm formation.

Another cross-country analysis was undertaken by van der Zwan et al. (2012) who investigated the gender differences in different stages of entrepreneurial processes, distinguished between people who have never considered starting a new firm, those considering this issue, nascent, young, and established entrepreneurs. They used cross-national data of 36 countries, including 32 European Countries, three Asian Countries, and the U.S., with random-coefficient binary logit models, over the period of 2009-2010. The results demonstrated that gender differences are more pronounced in the first and final levels of the entrepreneurial engagement. Especially, the rates of women entrepreneurs and the propensities of women to convert start-up ideas into start-up activities are relatively smaller in some European transition economies.

At the regional level, Fritsch and Schroeter (2011) investigated the reasons of regional variations in the effect of new firm formation on employment growth across the regions in the Western Germany, between the periods of 1980-2002. The study demonstrates that there is an inverse U-shaped link between the rate of start-up activity and change in employment growth in a region. The authors determined the main factors shaping the employment effects of new firms in a region as follows: population density, the character of the entrepreneurs in a region, and the amount of innovative activities. Among these variables, population density has the greatest effect on these differences.

Gaygısız and Köksal (2003) conducted a study at the province level that aimed to explore the effects of regional characteristics that play crucial roles on the formation of new firms across provinces in Turkey for the period of 1985 to 1990. Using cross-section and panel data with OLS regression, the study demonstrated that the regional differences in the rates new firm formation have been explained by population density at best. The authors concluded that since the highly populated regions are more prosperous have relatively high level of firm formation.

As a result, there are several important findings emerged from these studies which are consistently with the arguments in the theoretical literature. Firstly, the relationship between population density and new firm formation is positive. Secondly, the likelihood of becoming entrepreneur decreases with age. Finally, male have more tendency than female to be nascent entrepreneurs.

4.3.2. Empirical evidence on the resources of the regions

This sub-section provides empirical evidence on the resources of the regions. Respectively, the studies related to the relationship between education, human capital, financial capital, social capital and new business formation are summarized (See Table 4.7).

In this respect, using cross-national data, Álvarez-Herranz et al. (2011) investigated the impacts of socio-demographic factors on nascent entrepreneurs across 22 different countries with different levels of income for the period from 2002 to 2006. Using cross-section and time series data with generalized least squares (GLS) regression, the results indicated that among socio-demographic factors education, age and previous job experience of individuals have significantly and positively affected the entrepreneurial behaviour of individuals. However, to start a new business female entrepreneurs need to more education level and to be older (between 35 and 44) than their male counterparts. The authors argued that female entrepreneurs start their businesses later than men because generally they launched a new business after obtaining sufficient education.

At the individual level, Evans and Leighton (1990) examined the factors that have influences on individual's decision to be self-employment, and the determinants of self-employment incomes. Using individual level data in the U.S. for the period of 1968 to 1987, the study demonstrated that educational attainment is positively associated with the start-up decision of individuals. In contrast, the authors did not find any link between the likelihood of becoming self-employment and age and previous job experiences. However, individuals with more financial capital are more likely to start their own businesses. Lastly, it was indicated that poorer paid-employees and unemployed workers are more likely to switch into self-employment.

Examining the relationship between entrepreneurial activity and the quality of venture capital, Kreft and Sobel (2005) aimed to investigate whether the presence of more venture capital stimulates entrepreneurial activity in a region, or whether more entrepreneurial activity results in the flow of more venture capital in this region. The study used panel data of 50 states in the U.S. with Ganger causality model for the period of 1992 to 2001 and indicated that a one-way causal relationship have emerged between

Table 4.7: Empirical evidence on the resources of the regions

Study	Level	Sample	Variables	Entrepreneurship	Main Findings
Álvarez-Herranz et al. (2011)	Country	22 countries, From 2002 to 2006	Dependent Variable: Total entrepreneurial activity (TEA) rate (Nascent and new entrepreneurs) Independent Variables: Education; Age; Previous job experience	Nascent entrepreneurs	Education, age and previous job experience of individuals have significantly and positively affected the entrepreneurial behaviour of individuals.
Evans and Leighton (1990)	Individual	Individuals in the US, From 1968 to 1987	Dependent Variable: Entry rate of self-employment Independent Variables: Education; Job tenure; Unemployment; Previous job experience; Marital status; Frequency of job changes; Liquidity constraints; Health problem; and Wage earnings	Self-employment rate	Educational attainment is positively associated with the start-up decision of individuals.
Kreft and Sobel (2005)	State	50 states in the U.S., From 1992 to 2001	Dependent Variable: Venture Capital Investment; and the rate of entrepreneurial activity (The number of proprietors and Patent activity) Independent Variables: Venture Capital Investment; and the rate of entrepreneurial activity (The number of sole proprietors and Patent activity)	The number of sole proprietorships	The existence of more entrepreneurship in an area causes the more inflow of venture capital.
Naudé et al. (2008)	Regional	354 regions in South Africa, From 2003 to 2004	Dependent Variable: Total entrepreneurial activity (TEA) rate Independent Variables: Number of banks; Economic size; Education; Unemployment; Profit; Population; and Population density	Start-up rates	Access to financial capital, educational attainment, profit rates, and agglomeration are the most important determinants of start-up activity.
Cetindamar et al. (2012)	Individual	2417 adults, For the year 2006	Dependent Variable: Engagement in entrepreneurship; Total entrepreneurial activity (TEA) rate (Nascent and new entrepreneurs) Independent Variables: Education level; Family size; Monthly income level; Age; Marital status; Gender	Total entrepreneurial activity (TEA) rate	Regardless of sex all three types of capital (human, social and financial) affect the likelihood of starting a business in different levels.

entrepreneurial activity and venture capital investments. In other words, the existence of more entrepreneurship in an area causes the more inflow of venture capital, whereas venture capital has no effect on entrepreneurial activity in such area.

In order to investigate the role of financial capital on the start-up activity across 354 regions in South Africa, Naudé et al. (2008) used cross-sectional data with tobit model, during the period of 2003 to 2004. The findings demonstrated that access to financial capital, educational attainment, profit rates, and agglomeration are the most important determinants of start-up activity across regions in South Africa. Among these determinants, due to increased competition 'agglomeration' is negatively related to start-up rates, but access to formal bank (financial capital) and profits are strongly and positively associated with start-up activity.

Likewise Kreft and Sobel (2005) and Naudé et al. (2008), Cetindamar et al. (2012) investigated the impact of financial capital together with human and social capital on new business formation between different genders in Turkey. Using individual data of 2417 adults from GEM database with logit model for the year of 2006, the study found that regardless of sex all three types of capital (human, social and financial) affect the likelihood of starting a business in different levels. In addition, according to the findings human capital is much more important for women than men while starting a business. Also, social capital facilitates the process of entry into a new entrepreneurial activity for women. But, there is no gender difference in the effect of financial capital on the new business formation.

The results indicated that educational attainment, human capital, financial capital and social capital are key pillars of the new business formation in an area. All most all of the studies found a positive correlation between these variables and regional entrepreneurial activity.

4.3.3. Empirical evidence on the economic structure of the regions

This sub-section provides empirical evidence on the economic structure of the region and its effect on the new business formation. In this context, the studies focused on the following topics such as clusters/industrial agglomeration, knowledge, demand/income, and employment have been evaluated here (See Table 4.8).

Using regional level data, for example, Rocha and Sternberg (2005) investigated the impact of clusters/industrial agglomeration on new business formation and regional development across 97 regions in Germany, for the period 2001 to 2003. The study used total entrepreneurial activity (TEA) as the dependent variable regressed with the OLS against independent variables such as industrial agglomerations, clusters and control variables (i.e., population density, unemployment, and income per capita). The results demonstrated that clusters have a positive effect on regional entrepreneurial activity. Based on these findings, the authors concluded that regions with higher degree of clusters have relatively higher level of start-up rates than regions without clusters.

In a similar vein, Delgado, Porter, and Stern (2010) examined the relationship between regional entrepreneurship and clusters for the period of 1990-2005. The study used growth rate of start-ups as the dependent variable and the industry specialization and the strength of cluster environment as the main independent variables with several other variables. The findings showed that regional clusters have a significantly positive impact on regional entrepreneurial activity. Moreover, strong clusters are positively associated with new firm formation of established firms and the survival of the firms.

In another study Armington and Acs (2002) examined the impact of certain regional factors on new business formation across 394 regions in the U.S. for the period between 1991 and 1996. Using panel data of these regions with the OLS regression, the study revealed that the variations in firm birth rates across regions are explained by industrial density, population and income growth. There is also a positive relationship between human capital and the formation of new firms. Establishment size in this analysis was negatively related to the firm start-up rates, referring that regions relatively have more small establishments will have higher levels of start-ups than regions have more large establishments.

Table 4.8: Empirical evidence on the economic structure of the regions

Study	Level	Sample	Variables	Entrepreneurship	Main Findings
Rocha and Sternberg (2005)	Regional	97 German regions, From 2001 to 2003	Dependent Variable: Total entrepreneurial activity index (TEA) (the number of nascent and new firms) Independent Variables: Industrial agglomerations; Clusters; and Clusters with external networks; and Control variables (Population density, Skills, Unemployment, Income per capita, Population, University degree)	Start-up rates	Regions with higher degree of clusters have relatively higher level of start-up rates than regions without clusters.
Delgado, Porter, and Stern (2010)	Regional	Diverse regions, From 1990 to 2005	Dependent Variable: Growth rate of start-ups Independent Variables: The initial level of start-up activity; industry specialization; the strength of cluster environment; and region-industry fixed effects	Start-up rates	Clusters have a significantly positive impact on regional entrepreneurial activity.
Armington and Acs (2002)	Regional	394 regions of the US, From 1991 to 1996	Dependent Variable: Annual Firm birth rate divided by the labour force (in thousands) Independent Variables: Establishment Size (the number of employment divided by the number of establishments); Population density; Industry density; Population growth; Income growth; Unemployment rate; The share of proprietors; and Education	Annual firm birth rates	The variations in firm birth rates across regions are explained by industrial density, population and income growth.
Kibler (2003)	Regional	834 working-age Finnish individuals, For the year 2006	Dependent Variable: Entrepreneurial Intention Independent Variables: TPB antecedents; Regional environment (Pop. Density, Education, Income, Financial resources and assets, Public, Agriculture and Manufacturing, and Service sector, Political ethos, and Net entry rate); Individual Controls (Age, Gender, Entrepreneurial experience, and Educational Level)	Firm entry and exit rate	The level of income and wealth is positively associated with entrepreneurial intention.

In addition, Kibler (2003) analyzed the impact of the regional environment on the regional entrepreneurial intention and activity. The study used primary survey data of 834 working-age Finnish individuals for the year of 2006 with factor analysis. The results demonstrated that the level of income and wealth is positively associated with entrepreneurial intention, consisting with the literature implies that higher demand and purchasing power of customers in a region combined with higher economic growth promotes individuals perceptions of new business opportunities in the local markets for launching a new business. In contrast, higher population density and educational level, higher share of employment in public and manufacturing sector are found to weaken the individuals' perception of new business opportunities and their entrepreneurial intentions.

As a result, the studies arrived at important conclusions. At first, the studies indicated that clusters have positively affected regional entrepreneurial activity. Secondly, due to increasing purchasing power and demand, income growth is positively associated with entrepreneurial intentions in these studies. Thirdly, presence of small firms in a region has positive effect on new firm formation. Lastly, higher share of employment in public and manufacturing sector are found to negatively relate to new business formation.

4.3.4. Empirical evidence on the institutional structure of the regions

This sub-section provides empirical evidence on the impact of institutions, regulation and taxation on regional entrepreneurial activity (See Table 4.9).

At the country level, Torrini (2005) conducted a study to investigate the impact of institutional variables on the differences in the rate self-employment across 25 OECD countries, over the period from 1997 to 1998. The study used self-employment rate as the dependent variable against independent variables including corruption index, wedge, product market regulation, replacement rate, employment protection legislation and some other variables. Using panel data with the OLS regression, researchers found that an increase in the tax rates triggered individuals to shift from self-employment towards paid employment when tax evasion is not allowed and strictly controlled. In contrast, if there is a lower control regarding the tax evasion, especially for self-employment, an increase in the tax can promote self-employment in such countries. The findings also

demonstrate a positive correlation between self-employment and product market regulation, but a negative relationship between self-employment and the unemployment benefit replacement ratio.

Another cross-country analysis was undertaken by Nyström (2008) who examined the role of institutions in the process of formation of new businesses across countries. Their sample included 23 OECD countries and covered the period of 1972 to 2002. Like Torrini (2005), Nyström used self-employment rate as the dependent variable and size of government, legal structure and security of property rights, and regulation of credit, labour and business as the main independent variable together with several other variables. The study used a fixed effects panel data model and indicated that institutional quality (economic freedom, characterized as the size of government, legal structure and security of property rights, access to sound money, freedom to trade internationally, and the regulation of credit, labour and business) plays a key role in the entrepreneurship. In other words, less burden of regulation regarding to credit, labour and business, smaller public sector, better legal structure and security of property rights are positively associated to an increase in the rate of self-employment.

In a similar vein, Klapper et al. (2010) conducted a study to explore the effects of regulatory, political, macro-economic and institutional changes on new firm formation across 84 countries over the period of 2003 to 2005. Using time-series data with the multivariate panel analyses, the study revealed that the quality of institutional arrangements or better governance and ease of access to financial capital have positively affected the entry rate of firms. In contrast, the credit constraints and regulatory burdens are negatively associated with entry rate and business density.

Using cross-national data for the year of 2001, Ardagna and Lusardi (2010) examined the impact of regulations on entrepreneurship across 37 developed and developing countries. Similar to the above studies, the authors suggested that regulations (entry regulation, contract enforcement regulation and labor market regulation) play vital roles on the decision of individual to launch a new firm.

Table 4.9: Empirical evidence on the institutional structure of the regions

Study	Level	Sample	Variables	Entrepreneurship	Main Findings
Torrini (2005)	Country	25 OECD countries, From 1997 to 1998	Dependent Variable: Self-employment rate Independent Variables: GDP per capita; Unemployment rate; Public sector size; Corruption index; Wedge; Product market regulation; Replacement rate; and employment protection legislation	Self-employment rate	An increase in the tax rates triggered individuals to shift from self-employment towards paid employment when tax evasion is not allowed and strictly controlled.
Nyström (2008)	Country	23 OECD countries, From 1972 to 2002	Dependent Variable: Self-employment rate Independent Variables: GDP per capita; Unemployment; Size of government; Legal structure and security of property rights; Access to sound money; Freedom to trade internationally; and Regulation of credit, labour and business	Self-employment rate	Institutional quality plays a key role in the entrepreneurship.
Klapper et al. (2010)	Country	84 countries, From 2003 to 2005	Dependent Variable: Entry rates; Business density; and Entry per capita Independent Variables: Entry procedures; Rigidity of employment; Governance; Domestic credit; and GDP per capita	The numbers of new registered businesses	The quality of institutional arrangements or better governance and ease of access to financial capital have positively affected the entry rate of firms.
Ardagna and Lusardi (2010)	Country	37 developed and developing countries, For the year 2001	Dependent Variable: Total entrepreneurial activity (TEA); Opportunity and Necessity TEA Independent Variables: Entry; Procedures; Time; Cost; Regulation; Contract; Quality of bureaucracy; Labour; Union density ; and Country dummies	Total entrepreneurial activity (TEA)	Regulations play vital roles on the decision of individual to launch a new firm.
Dr'az Casero (2013)	Country	54 countries, From 2006 to 2007	Dependent Variable: Total entrepreneurial activity (TEA) Independent Variables: Expected size of business sector; Health and primary education; Integrity of the legal system; Fulfilling contracts; Size of government; costs, taxes, public enterprises; and Credit available to the private sector.	Total entrepreneurial activity (TEA)	The institutional variables that affect the formation of new business may vary across countries depending on their economic development level.

Besides, Di'az Casero (2013) investigated the impact of institutions on entrepreneurial activity in a group of countries, classified depending on their economic development levels. Using the datasets of 54 countries for the period 2006-2007 with the multiple linear regressions, the results indicated that the institutional variables that affect the formation of new business may vary across countries depending on their economic development level. In other words, while the variables like “size of the business sector” and “health and primary education” act as determinant of entrepreneurship in developing countries, the “integrity of the legal system” and “fulfilling contracts” are critical for transition economies, and the “size of the government” and “credit available to the private sector” for developed countries.

As a result, the studies demonstrate that institutional arrangements are the crucial factors determining new business formation. In addition, it was indicated that the impact of these variables on entrepreneurial activity may vary depending on the development stage of the countries. The studies also indicated that while good institutional arrangements have a positive effect on economic development and start-up activities, weak institutional arrangements negatively affect. Besides, it was found that while countries/regions with heavier administrative and regulatory burdens are less attractive for entrepreneurial activity, countries/regions with effective and less regulations are more attractive areas for entrepreneurial dynamics. Finally, it was showed that the impact of taxation on new business formation may differ across countries, due to the diverse attitudes of governments against tax evasion.

4.3.5. Empirical evidence on the cultural structure of the regions

This sub-section provides empirical evidence on the relationship between culture, entrepreneurial culture and entrepreneurial activity across diverse regions and countries (See Table 4.10).

Audretsch and Belitski (2013) examined Romer's Knowledge Production Function (KPF) and the Knowledge Spillover Theory of Entrepreneurship (KSTE), through distinguishing ordinary human capital and creativity embodied in people. The authors focused on the diverse urban environments that have an effect on creative classes. Using panel data of 12 European countries with generalized least squares models, the study

demonstrated that the creativity pillar (diversity, creative professionals and bohemians) has a positive and significant impact on entrepreneurship, implying that regions with a higher concentration of ideas and talented people generated more entrepreneurial opportunities than regions with a paucity of creativity and new ideas. Thus, the authors assumed that regions with a climate of openness, tolerance and cultural diversity will attract and encourage the creative class to agglomerate in these regions, leading to the generation of new business opportunity and an increase in the level of entrepreneurial activity in these areas.

In a similar direction, Linan and Fernandez-Serrano (2014) conducted a country level study to explore the specific role of national culture in the economic development and in the entrepreneurial activity. Their sample included 19 European Union countries and covered over the period of 1985 to 2011. The researchers used cross-national data with the OLS analysis and argued that culture is one of the key elements that explain the differences in the national level of entrepreneurial activity. In addition, culture helped to explain the variations in the relationship between entrepreneurship-income across EU countries.

At the regional level, Beugelsdijk (2007) examined the link between entrepreneurial culture, regional innovativeness and economic growth across 54 European regions, for the period of 1950-1998. Using cross-sectional data with the OLS regression, the researcher found that the variations in entrepreneurial culture can explain the differences in the economic growth of the 54 European regions. In their regression results entrepreneurial culture is significantly and positively related to regional economic growth. Thus, the author concluded that economic growth depended on an entrepreneurial spirit, and also, culture together with institutional arrangements determines the allocation of entrepreneurial activity across the regions.

Likewise, Fritsch and Mueller (2007) conducted a study to investigate the influence of innovation and entrepreneurial climate on new business formation at the regional level. The study used panel data of Western Germany regions with the OLS regression, for the period of 1983-2002.

Table 4.10: Empirical evidence on the cultural structure of the regions

Study	Level	Sample	Variables	Entrepreneurship	Main Findings
Audretsch and Belitski (2013)	Country	12 European countries, From 1999 to 2010	Dependent Variable: The number of new businesses; of Self-employment; and of SMEs Independent Variables: Creativity; Regulatory ; Normative; Conducive; and Control variables	The rate of start-up; The number of self- employment; The number of SMEs	Countries with a climate of openness, tolerance and cultural diversity will attract and encourage the creative class to agglomerate in these countries.
Linan and Fernandez-Serrano (2014)	Country	19 EU countries, From 1985 to 2011	Dependent Variable: GDP per capita Independent Variables: Entrepreneurial variables; Cultural Variables; and Country dummy	Total entrepreneurial activity (TEA); Necessity-driven and Opportunity-driven TEA	Culture is one of the key elements that explain the differences in the national level of entrepreneurial activity.
Beugelsdijk (2007)	Regional	54 European regions, From 1950 to 1998	Dependent Variable: Economic growth rate Independent Variables: Initial level of GRP per capita; Investment ratio; School enrolment rate; spatial correlation; Agglomeration; Regional innovativeness; and Entrepreneurial culture	The rate of self- employment	Entrepreneurial culture is significantly and positively related to regional economic growth.
Fritsch and Mueller (2007)	Regional	Western Germany regions, From 1983 to 2002	Dependent Variable: Start-up rates Independent Variables: Entrepreneurial climate; Innovative activity; Agglomeration ; Demand; Unemployment; and previous start-up rates	Start-up rates	Innovation and entrepreneurial climate are the main factors that determine the level of regional new firm formation.
Stuetzer et al. (2014)	Regional	Regions in Western Germany, From 2002 to 2009	Dependent Variable: Start-up intentions Independent Variables: Perceived founding opportunities; Knowing other entrepreneurs; Share of small firms and creative class; Historic start-up rate; GDP per capita; Perceived entrepreneurial skills; and etc.	The rate of start-up activity	Entrepreneurial culture is positively affected the perception of new business opportunities and start-up activity.

The results indicated that innovation and entrepreneurial climate are the main factors that determine the level of regional new firm formation, and also triggered the differences of new business formation in the regional level. In addition, regional start-up rates are explained by existing entrepreneurial activity in the regions. Thus, the authors concluded that regional new business formation activity is highly path-dependent and thus rather persistent over time.

Besides, using cross-sectional data for the period of 2002-2009, Stuetzer et al. (2014) aimed to examine the influence of regional characteristics on individual entrepreneurship across regions in the Western Germany. Researchers found that there is no direct link between knowledge creation, the economic context and entrepreneurial culture at the regional level. However, there is an indirect effect of entrepreneurial culture, knowledge creation and economic context on the perception of new business opportunities and start-up activity. These imply that higher share of creative class and small firms, higher GDP per capita and start-up activity, and lower and shrinking unemployment in a region are positively associated with a higher likelihood of having start-up intentions and launching a new business activity.

To sum up, the findings demonstrated that culture is one of key factors that determine the level of regional or national entrepreneurial activity. In this respect, it was found that on the one hand, regions or countries with high-level uncertainty avoidance have relatively lower levels of entrepreneurial activity or new businesses formation. On the other hand, regions or countries with a climate of openness, tolerance and cultural diversity attract entrepreneurs and encourage the formation of new businesses. In addition, the studies indicated that there is a positive and significant relationship between entrepreneurial culture and new business formation.

CHAPTER 5

THE MAIN ATTRIBUTES OF ENTREPRENEURSHIP IN TURKISH REGIONS

The main purpose of this chapter is to investigate the main features of the variables used in this study to explore the relationship between entrepreneurship and regional economic development at NUTS 2 regions of Turkey. The data of 26 NUTS 2 regions is drawn from several sources. For example, to describe the pattern of regional entrepreneurial activity, data on self-employment was taken from Turkish Statistical Institute (TurkStat). The data covers the years 1985, 1990, 2000, and 2004-2014 for regions at NUTS 2 level. Additional indicator of regional entrepreneurial activity is based on firm births and deaths data. The annual data of firm births and deaths was published by TurkStat until 2009, but due to new legal regulations The Union of Chambers and Commodity Exchanges of Turkey (TOBB) has been responsible for releasing this data. The data is available for the period of 1987-2014 at NUTS 2 level. To show the pattern of regional growth, data on GDP per capita (1987 fixed prices) and GDP per capita growth were taken from National Accounts in TurkStat which covers the period between 1987 to 2001 for the regions at NUTS 2 level. However, in the following years the GDP data at these levels was not published. To observe the variations in the regional economic growth for the period of 2001-2011 the Gross Value Added (GVA) data has been used that was obtained from TurkStat and available only for NUT 2 regions.

In addition, this chapter explores the variations in regional employment and unemployment rates. The data of employment and unemployment are collected from TurkStat and it is available for the years 1985, 1990, 2000 and the period of 2004-2014 for the NUTS 2 regions. To explore the demographic composition of the regions, the

data of population density and age groups is used and obtained from TurkStat, from the section of Population and Demography. The data covers the period of 1980-2014 for regions at NUTS 2 level.

Furthermore, this chapter examines the differences in the level of regional resources which are innovations, human capital and financial capital. Regional innovative activity is measured by using the number of patents. The data of patents is drawn from Turkish Patent Institute which is available for the period of 1995-2014 both at national and regional (NUTS 2) levels. To illustrate the level of regional human capital, the data of population with university education were collected from TurkStat, covering the years 1985, 1990, 2000, and 2008-2013 for NUTS 2 regions. Lastly, to show the pattern of regional financial capital, data on bank deposit per capita was obtained from the Banks Association of Turkey, which is available for the period of 1988 to 2013.

The spatial distribution of these indicators for two different time periods has been shown at NUTS 2 regional level to enable us to investigate and understand the changes experienced in the regions over time.

5.1. Entrepreneurship

Entrepreneurs are widely recognized as the main drivers of economic growth due to leading invention, innovation, knowledge spillover, employment generation and new firm formation.

Measuring of entrepreneurship is a crucial issue to analyze the impact of entrepreneurship on regional economic growth. As entrepreneurship is a multidimensional and many researchers and policy makers have focused on different aspects of the functional role of entrepreneurs in the economy theory, there is no consensus on the theoretical definition and measure of entrepreneurship. While Joseph Schumpeter emphasized ‘innovative and creative’ aspect of entrepreneurship, Frank Knight paid an increasing attention on ‘the risk and uncertainty bearing’ feature of entrepreneurship, and Israel Kirzner attached importance to ‘alertness to opportunity’ characteristic of the entrepreneurship. Therefore, the measurement issue of entrepreneurship has been a considerable subject of debate among researchers. In this

respect, in the empirical studies diverse measures of entrepreneurship have been used and thus, the literature has described different proxies in measuring entrepreneurship in the empirical studies. Many researchers have focused on the issue of measuring entrepreneurship but no measure has been more effective than the other. Each indicator may provide some opportunities and challenges that are likely to affect the results of research (Gartner and Shane, 1995).

The most common measures of entrepreneurship used in the empirical literature are self-employment rate (or business ownership rate) and the rate of new firm formation (Acs and Armington, 2004; Acs et al., 2005; van Stel and Suddle, 2005; Audretsch and Keilbach, 2005). Besides these, depending on the availability of the data, researchers have used different indicators as proxies of entrepreneurship. For example, the numbers of patents, small and medium-sized enterprises, and young enterprises are some of them. In addition, in recent years Global Entrepreneurship Monitor (GEM) describes three different types of entrepreneurship based on the stage of entrepreneurial activity: nascent entrepreneurs, new business owners and established business owners that are also labelled as Total Entrepreneurial Activity (TEA). World Bank Group Entrepreneurship Survey (WBGES) also identifies three different proxies of entrepreneurship: entry rate, entry per capita and business density.

Although there is a tendency to use different measures of entrepreneurship in this study, the paucity of data forced to use the self-employment rate (or business ownership) and the number of firm entries and deaths as the main measures of entrepreneurship.

Self-employment

As a fraction of the labour force, self-employment is commonly used as a measure of entrepreneurship in the empirical studies, especially due to the availability of data (Acs et al., 2005; Henderson, 2006; Mandelman and Montes-Rojas, 2009). The rate of self-employment or business ownership has been used in many empirical studies at different levels (i.e., at the individual level Baumol (1993) and Reynolds and Curtin (2008); at the regional level Saxenian (1994), Beugelsdijk and Noorderhaven (2004), and Acs et al. (2008); and at the country level Blanchflower (2000) and Acs et al. (2005)). However, despite wide use of self-employment rate or business ownership rate as a measure of

entrepreneurship, it is not a perfect measure due to capturing all types of small businesses which are not completely related to entrepreneurial activity (Acs et al., 2008). The self-employment data are likely to include various groups such as shopkeepers, craftsmen, farmers, architects, doctors, lawyers and other individuals who choose self-employment due to having unsatisfactory or non-existent work options. Therefore, researchers indicated that self-employment rate may capture only some aspects of entrepreneurship which are pointed out above in the literature review. It is generally argued that self-employment captures risk and uncertainty bearing and owner/operator aspect of entrepreneurship, emphasized by Frank Knight, but only a few of them meet the innovation attribute of entrepreneurship or Schumpeter entrepreneurship. Thus, when researchers examine the relationship between entrepreneurship and regional economic development, they should take into account these features of entrepreneurship measures.

Following Evans and Leighton (1989), Folster, (2000), Acs et al. (2005), and Henderson (2006) this study uses the rate of self-employment or business ownership as a measure of entrepreneurship. Even though self-employment is not the ideal measure of entrepreneurship, the measure is represented by the number of non-agricultural self-employment which is available in different periods for NUTS 2 regions of Turkey. The main aim is to explore the entrepreneurial capacity of the regions and whether there is a relation between the entrepreneurial capacity of the regions and their economic development levels. It is expected that regions with higher levels of entrepreneurial activity have higher levels of economic growth than regions with lower levels of entrepreneurial activity.

For this study, the self-employment data were obtained from Turkish Statistical Institute (TurkStat) which is available for the years 1985, 1990, 2000, and for the period of 2004-2011 at the NUTS 2 and national level. The regional entrepreneurial capacity was obtained from the data on self-employment and was calculated based on Labour Market Approach. According to this approach, the entrepreneurial activities come from the labour force and thus the labour force should be used as the denominator, rather than total population (Acs and Armington, 2004; Baptista, Escaria, and Madruga, 2005). In this respect, to measure the entrepreneurial capacity of the regions, the total number of

entrepreneurs is divided by the total number of labour force and then multiplied by a thousand. In other words, the number of self-employment in a region per 1000 people in the labour force is representing the entrepreneurial capacity of each region. This variable can be expected to be more reliable than the number of self-employment per capita considering that the employment data is more related to entrepreneurship than the population data. The self-employment is already regarded as a part of labour force;

therefore it is expected that this variable may represent more reliable results than the self-employment per capita.

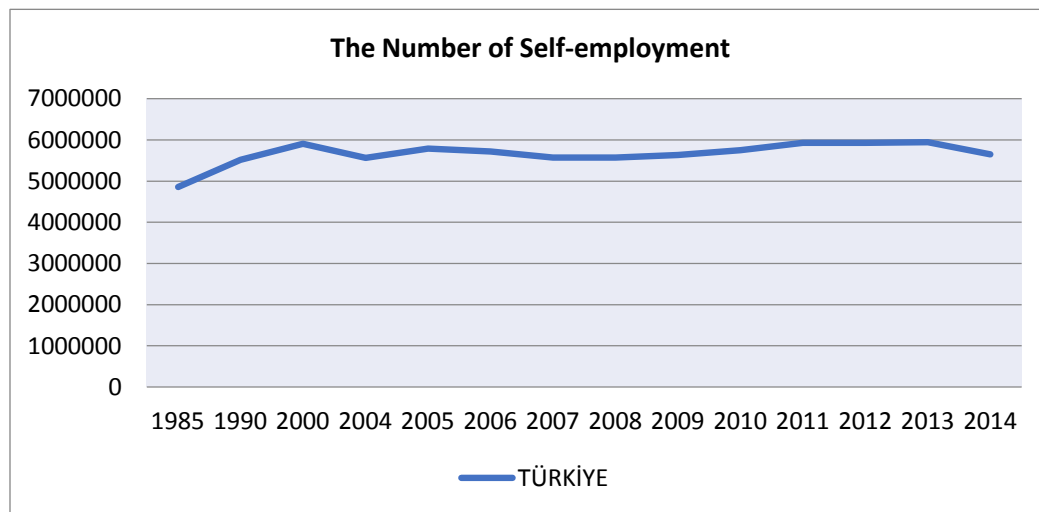
$$\text{Rate of self – employment} = \frac{\text{Total Number of Self–employment}}{\text{Total Number of Labour Force}} \times 1000 \quad \text{Eq (1)}$$

In this respect, Figure 5.1 demonstrates the variation in the total number of self-employment in Turkey for the period of 1985-2014. After the recession of the capitalism in the 1970s, Turkey, by altering the import substituting industrialization model, entered into the neoliberal era in the 1980s. With the implementation of the neoliberal economic model, the economy of Turkey has gradually integrated to the global economy. In this economic structure, it was almost impossible to stay away from competition that led to public and private organizations in Turkey to pay an increasing attention on entrepreneurship which is recognized as a source of economic growth and competitiveness. Thus, since the 1980s a considerable increase has been experienced in the levels of entrepreneurship in Turkey. In this regard, the studies for the development of entrepreneurship at the nationwide gained momentum in the 1990s. In addition, a substantial increase has been experienced in the number of agencies/organizations which provide financial and consultancy supports to entrepreneurs in recent years. For example, in the 9th Development Plan covering the period 2007-2013 and the 10th Development Plan covering the period 2014-2018, to increase the competitiveness of entrepreneurs and to enable them entry into new markets, the government supports training and consulting services, provide risk capital and pave the way of innovative activities of entrepreneurs.

However, despite all these positive developments, entrepreneurial level and quality have not reached the desired level in Turkey. According to Karadeniz (2010), the number of “opportunity-entrepreneurship” in Turkey increased in recent years, but as compared to

the other efficiency-driven economies the number was relatively low. On the other hand, the share of “necessity-entrepreneurship” in total entrepreneurial activity in Turkey was relatively higher than the average of these economies, indicating that many individuals in Turkey chose self-employment due to the lack of adequate and appropriate employment opportunities. Karadeniz also indicated that while people with higher level of education and income tend to be opportunity-driven entrepreneurs, people with low education and income due to having less employment options are pushed into necessity-driven entrepreneurial activity in Turkey. This may explain the reason behind why some regions simultaneously have relatively high level of entrepreneurial activity and low level of economic development. Therefore, the quality of entrepreneurship in a region is more important for economic growth rather than the quantity of entrepreneurship.

Figure 5.1 Changes in the Number of Self-employment in Turkey, 2004-2014



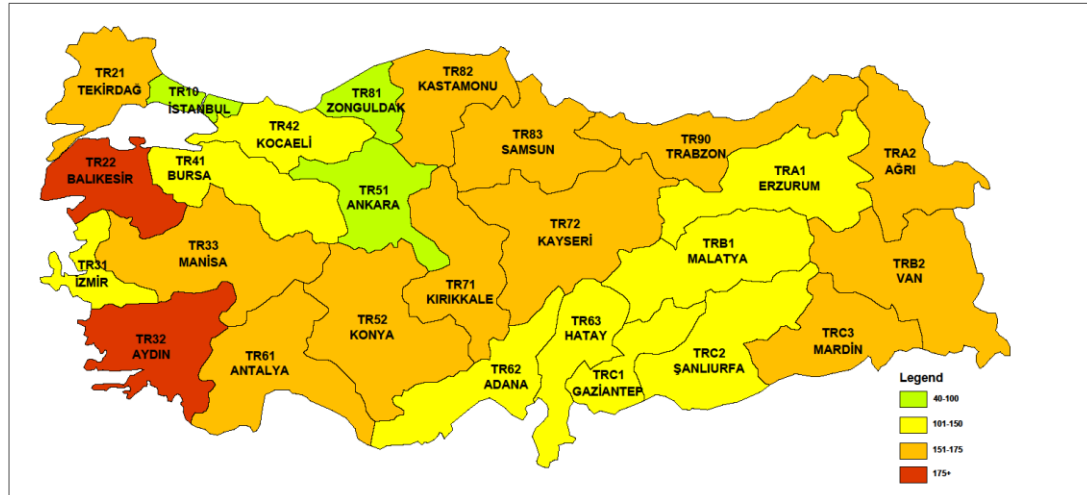
Source: Turkish Statistical Institute (TurkStat)

According to the Figure 5.1 the total number of self-employment increased from 4 855 207 in 1985 to 5 652 000 in 2014. Between 1985 and 1990, the number of self-employment increased significantly, but over 2000-2014 period, the number of self-employment declined or stagnated. As compared to the population which has 0.015 growth rate during the analyze period (1985-2014), self-employment has a very slow growth rate which is 0.005.

The underlying reason here can be that as experienced in many transition countries, high opportunity costs of starting a new business such as the heavier administrative and regulatory burdens push individuals into paid employment, rather than self-employment as occupational choice. Therefore, compared to developed countries with high levels of innovative entrepreneurship Turkey relatively has low level of entrepreneurial activity.

The Figure 5.2 indicates the entrepreneurial capacity of the NUTS 2 regions for the year 1985. The figure surprisingly shows that although regions like İstanbul, Kocaeli, Ankara, İzmir, Zonguldak, and Bursa have the highest GDP per capita during this time, they have the lowest entrepreneurial capacity. On the other hand, the regions which have lower levels of GDP per capita have higher levels of entrepreneurial activity in terms of self-employment. These negative relationships can be explained by the quality of the self-employment referring that while developed regions have higher rate of innovative, knowledge-based, and opportunity-driven self-employment, underdeveloped regions have higher rate of non-innovative and necessity-driven entrepreneurs which include shopkeepers, farmers and craftsmen.

Figure 5.2. Self-employment per 1000 Labour Force by NUTS 2 Regions, 1985

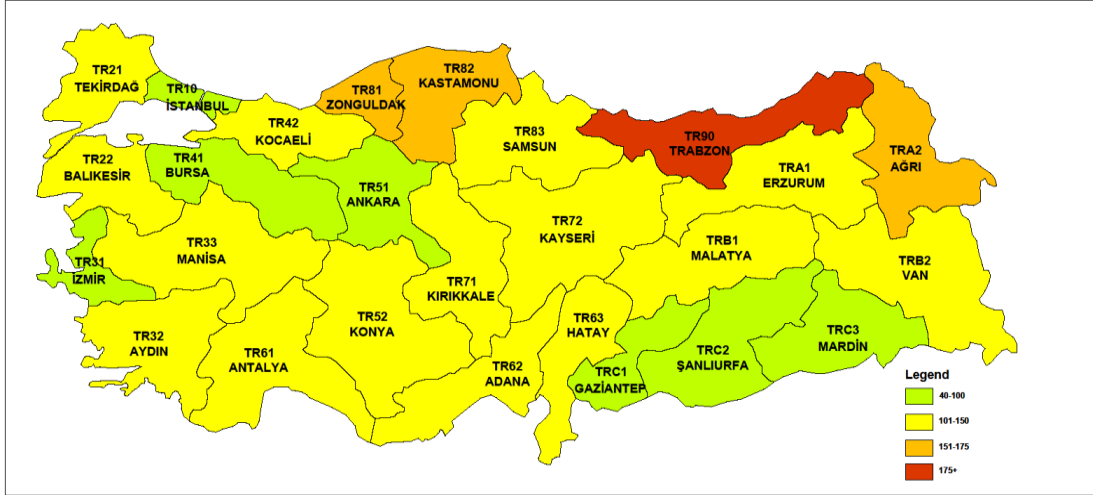


Source: Map created by author

The entrepreneurial capacity of the NUTS 2 region for the year 2011 has been illustrated in Figure 5.3. As can be seen in the map the pattern of entrepreneurial capacity in terms of self-employment rate has not changed much more. In 2011, among NUTS 2 regions

Trabzon, Kastamonu, Zonguldak, and Ağrı have the highest levels of entrepreneurial activity. On the other hand, Şanlıurfa, Mardin, İstanbul, Ankara, Bursa and İzmir have the lowest rates of self-employment. The above explanation is valid for this period.

Figure 5.3. Self-employment per 1000 labour force by NUTS 2 Regions, 2011



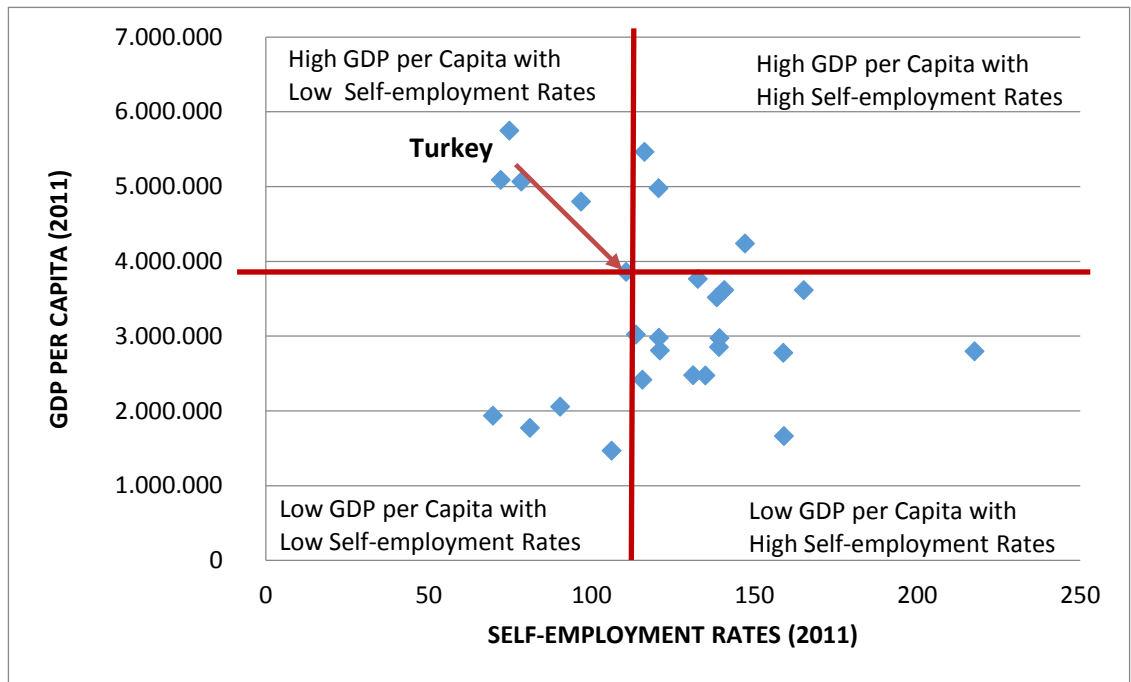
Source: Map created by author

Figure 5.4 reports the relationship between GDP per capita and rates of self-employment. In this respect, regions can be categorized into four groups:

- Regions with high GDP per capita and low self-employment rates,
- Regions with high GDP per capita and high self-employment rates,
- Regions with low GDP per capita and low self-employment rates,
- Regions with low GDP per capita and high self-employment rates.

As can be seen in the Figure 5.4 although the majority of the regions have lower GDP per capita than Turkey's GDP per capita, they have higher levels of entrepreneurial activity (self-employment rate) than Turkey's average. On the other hand, only a few of regions have both higher levels of GDP per capita and entrepreneurial activity. This figure strongly supports the above argument that although some regions have high levels of entrepreneurial activities they may have lower level of economic development. This can be explained by the type and characteristics of entrepreneurship which play an essential role on the regional economic development. In other words, while regions with

Figure 5.4. GDP per Capita and Self-employment per 1000 labour force by NUTS 2 Regions, 2011



higher levels of innovative and opportunity-driven entrepreneurship have higher levels of economic growth, regions with higher levels of non-innovative and necessity-driven entrepreneurship have relatively low levels of economic growth. Therefore, the quality of entrepreneurship is more effective than the quantity of entrepreneurship in determining the economic development levels of regions.

Firm Birth Rate

The number of new firm entries or start-ups is the other prevalent measure of the entrepreneurship used in this study. The idea behind using the rate of new firm formation goes back to the famous argument of Schumpeter “creative destruction” which means that through conducting new combination in the market the less productive firms remain ineffective and are pushed out of the market that lead to higher productivity and economic growth in a region (Aghion and Howitt, 1992). In other words, Gartner (1988) describes entrepreneurship as the creation of new ventures, implying that entrepreneurial activities include the rate new firm formation in a region. Many researchers argue that as compared to self-employment, new firm formation are

more entrepreneurial (Acs and Armington, 2003; Mueller, 2007; Acs and Mueller, 2007) because it captures Kirznerian (exploiting profitable opportunities), Knightian (taking risk), and Schumpeterian (exploiting innovation) entrepreneurship. Thus, new firm formation, through reducing unemployment, generating employment and innovation, and enhancing the competitiveness of an area, is widely considered as a crucial component of economic development and the commonly used measure of entrepreneurship. Therefore, it is important to explore the differences in the rates of new firm formation across NUTS 2 regions in Turkey. In general, it is expected that an increase in the number of firm entries have positively affected the economy of the regions.

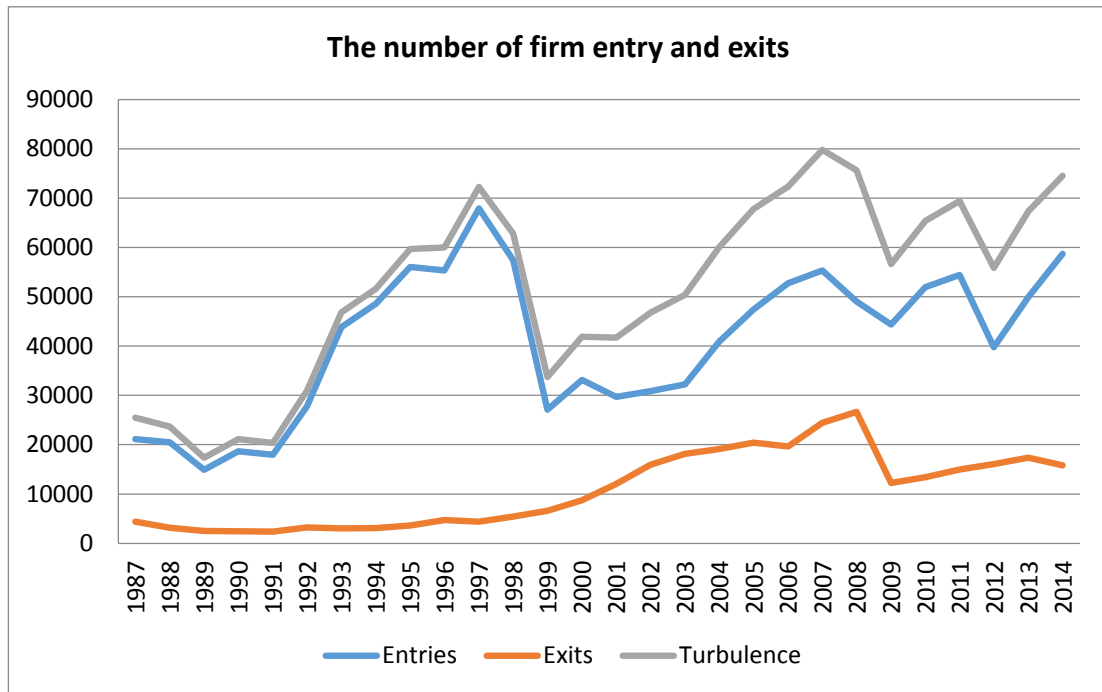
In this context, data of the number of new firm entries and exits is derived from TurkStat which is available for the period of 1987-2014. The entrepreneurial capacity of each region has been found by dividing the number of firm entries by total number of labour force (in thousands). According to Acs and Armington (2004), because it is a better measure of the number of potential entrepreneurs, labour force is preferred to employment and population size as a denominator. Hence, the regional entrepreneurship rate is expressed as the number of new firm births per 1000 people in the labour force. This is based on Labour Market Approach which assumes that entrepreneurs are the friction of labour force.

$$\text{Firm Birth Rate} = \frac{\text{Total Number of Firm Entries}}{\text{Total Number of Labour Force}} \times 1000 \quad \text{Eq (2)}$$

Figure 5.5 shows the variations in the number of firm births and deaths, and the total firm dynamics which is called turbulence described as the sum of firms' entries and exits in Turkey. The data of the numbers of firm births and deaths were taken from TurkStat and covers the period of 1987 to 2014 both for NUTS 2 regions. The number of new firm formation has followed a fluctuating trend over the past 27 years. During the period of 1987-1989, 1997-2000, 2007-2009, and 2011-2012 the number of new firm entries declined considerably. These periods mostly coincided with the crisis periods in Turkey. Conversely, between 1990 and 1996, 2001 and 2007, 2009 and 2011, and after 2012 the number of firm births increased significantly and reaching a peak of 55 350 in 2007. However, as can be seen in the figure, the number of firm deaths gradually increased

between 1987 and 2008, but then it started to decline. Also, there is no relationship between the number of firm exits and crisis periods.

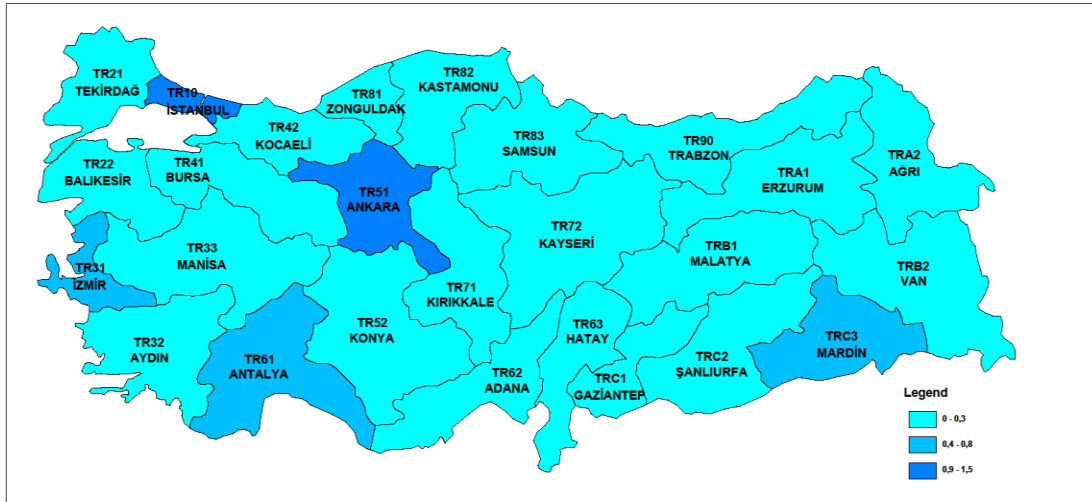
Figure 5.5. Changes in the Number of Firm Entries and Exits, and Turbulence (sum of the firms' entries and exits) in Turkey, 1987-2014



Source: Turkish Statistical Institute (TurkStat)

Figure 5.6 reports the rates of new firm formation in NUTS 2 regions. As indicated in Figure 5.6 the regions with the highest rates of firm entry in 1990 are İstanbul, Ankara, Bursa, İzmir, and Mardin. The result is consistent with the entrepreneurship literature which argues that regions with the higher levels of new firm formation have higher levels of economic growth. The result also confirms the argument that new firm formation is more entrepreneurial than self-employment.

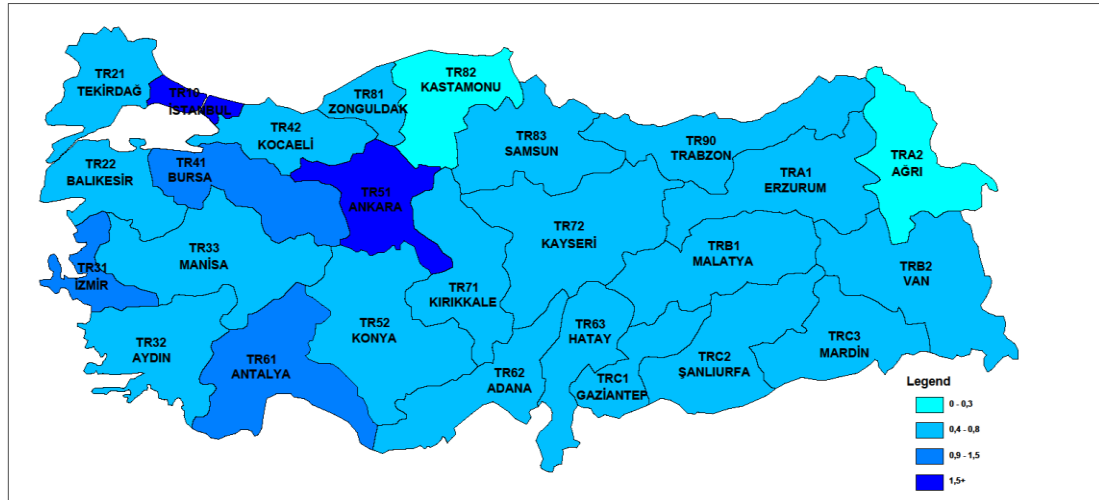
Figure 5.6. The Number of New Firm Births per 1000 People in the Labour Force by NUTS 2 Regions, 1990



Source: Map created by author

Firm birth rate per labour force by NUTS 2 for the year 2011 is also given in Figure 5.7. Similar to the previous period (1990), the regions having higher level of economic development also have the higher levels of entrepreneurial activity. The main underlying reasons of this situation are the presence of rich and diverse labour pool, high level of innovative activities and knowledge spillover, and the higher accessibility of human capital and financial capital in these regions which are the main stimulus of entrepreneurial activity. In addition, the large investments and incentives provided by the government triggered the formation of a dense economic activity in such areas that have led to high levels of new firm formation in these regions. On the other hand, as expected the regions with lower levels of economic development receiving lower levels of start-ups activities. The lack of resources such as financial and human capital, and low levels of innovations and information result in low levels of new firm formation in such regions.

Figure 5.7. The Number of New Firm Births per 1000 People in the Labour Force by NUTS 2 Regions, 2011



Source: Map created by author

Figure 5.8. GDP per Capita and Firm Birth Rates Labour Force by NUTS 2 Regions, 2011

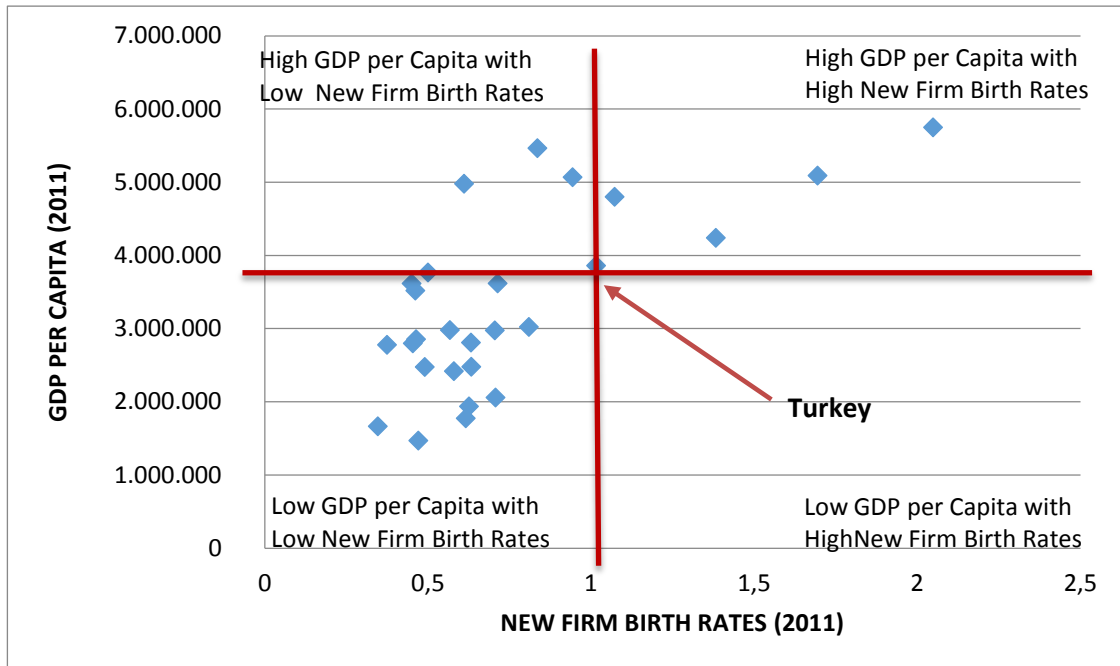


Figure 5.8 indicates the relationship between GDP per capita and the other measure of entrepreneurship, new firm birth rates. In this respect, regions can be categorized into four groups:

- Regions with high GDP per capita and low new firm birth rates,
- Regions with high GDP per capita and high new firm birth rates,
- Regions with low GDP per capita and low new firm birth rates,
- Regions with low GDP per capita and high new firm birth rates.

Figure 5.8 reports the relationship between GDP per capita and the rate of new firm formation for the year 2011. The figure demonstrates that the vast majority of the regions both have low level of GDP per capita and low levels of entrepreneurial activities. On the other hand, regions having higher rates of new business formation have higher level of GDP per capita. These results are consistent with the rhetoric of entrepreneurship is the essential driver of regional economic development. Further, the figure highlighted the importance of entrepreneurship for economic development. Therefore, to ensure regional economic growth/development, policy makers should take into account entrepreneurship in terms of firm birth rates and its effect on economic development.

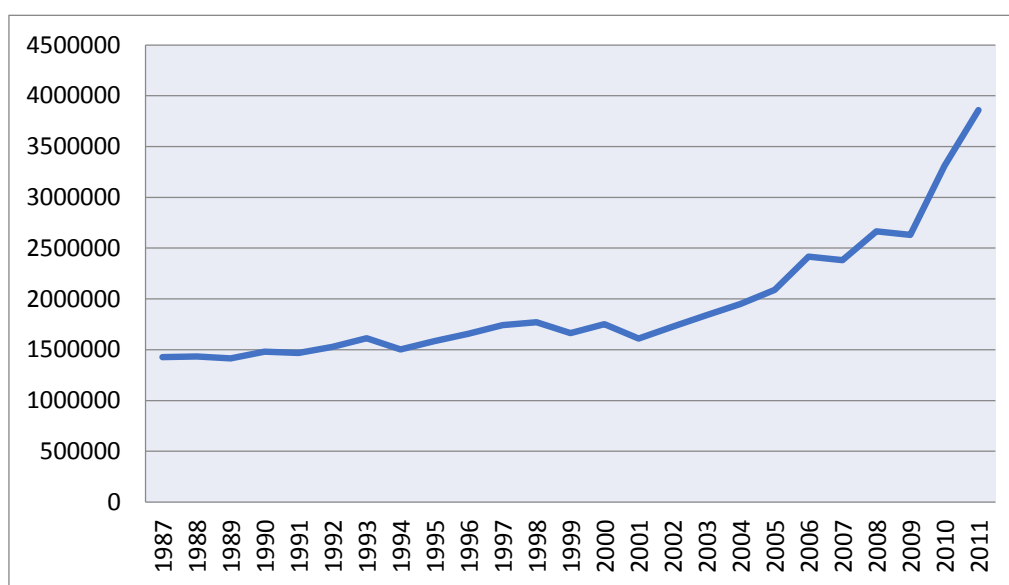
5.2. Economic Development and Growth

The Gross Domestic Product (GDP) and GDP per capita are the essential indicators used to describe the pattern of economic development of regions and countries. For this study, the data regarding GDP values were taken from Turkish Statistical Institute (TurkStat) which covers the period of 1987-2001 for NUTS 2 regions. After 2001 no GDP data were published. However, since 2004, the TurkStat has started to publish Gross Value Added (GVA) data for Turkey and NUTS 2 regions which is available over the period of 2004-2011. Thus, for a long-term observation, the GVA values of NUTS 2 regions were converted into GDP values. In addition, to monitor the economic growth of regions, the GDP values have been transformed into 1987 fixed prices.

After the recession of the capitalism starting from the early 1970s that hit hard the world economy, Turkey entered the neoliberal era in the 1980s and adopted neoliberal

economic model. This economic downturn forced various countries, including Turkey to take new structural adjustment and stability packages into their agenda. After the 1980s, the Turkish government developed the structural reforms for the liberalization of trade and financial markets and stimulated the mobility of capital and products to integrate national economy with the global markets (Boratav, 1991 in Sakızlıoğlu, 2011). The main aim of the government was to open Turkey up to the world markets. With the integration of the new markets Turkey has experienced a substantial increase in import and exports which made the country's economy externally dependent. This situation has led to the country's economy affected by external factors. In this regard, especially after the 1990 Turkey has experienced four important internal and external origin economic crises such as in 1994, 1998, 2001, and 2008.

Figure 5.9. Changes in GDP Per Capita of Turkey (1987 Fixed Prices), 1987-2011

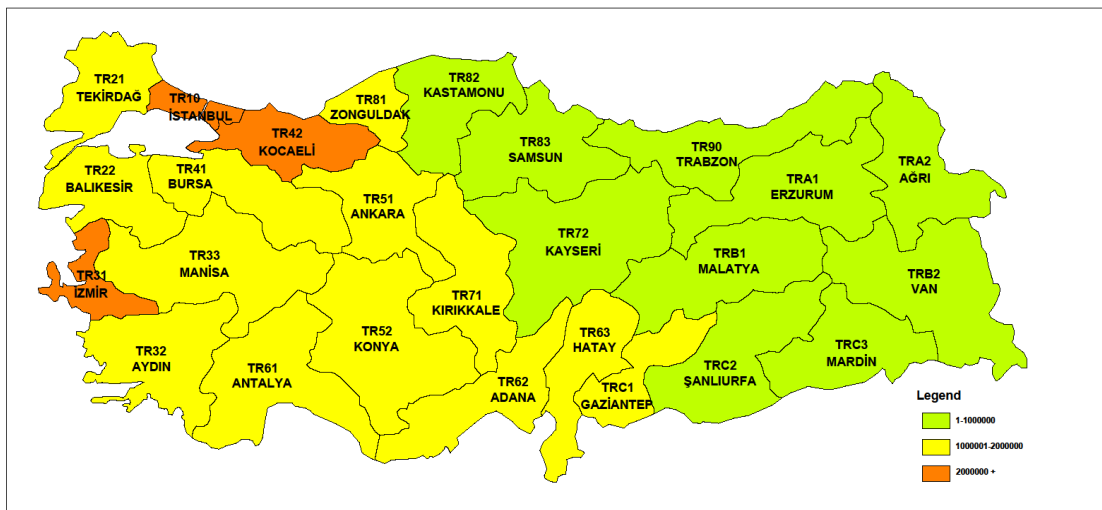


Source: Turkish Statistical Institute (TurkStat)

The Figure 5.9 demonstrates the changes in the GDP per capita of Turkey for the period between 1987 and 2011. The GDP per capita of Turkey increased from 1 427 491 Turkish Lira in 1987 to 3 859 161 Turkish Lira in 2011. However, during this time interval several fluctuations resulted from economic crises can be observed in the economy of Turkey. While the GDP per capita of Turkey decreased during the economic crises periods (1988-1989, 1993-1994, 1998-2001, and 2008-2009), it continued to rise

in the recoveries periods (1989-1993, 1994-1998, 2001-2008, and 2009-2011). In particular, after 2002 the growth rate of GDP per capita has shown a significant increase. The variations in per capita GDP for the year 1987 across Turkish regions are shown in Figure 5.10. The figure provides an understanding of difference between income levels of the 26 NUTS 2 regions in Turkey. The figure demonstrates that the regions with the lowest levels of GDP per capita in 1987 are Ağrı, Van, and Mardin, whereas the regions with the highest levels of GDP per capita are Kocaeli, İstanbul and İzmir. It is worth mentioning that while agricultural production constituted the main economic activities of the former, the manufacturing was the main economic activities of the latter. In general, the GDP per capita of the regions gradually increased from east to west.

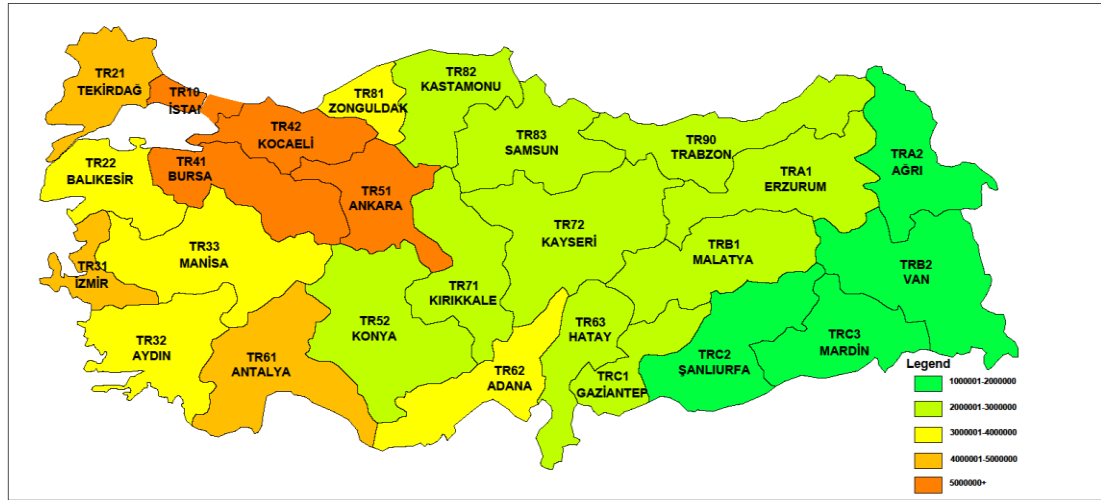
Figure 5.10. GDP per Capita by NUTS 2 Regions (1987 Fixed Prices), 1987



Source: Map created by author

The Figure 5.11 illustrates the spatial distribution of GDP per capita of NUTS 2 regions for the year 2011. According to the figures, the pattern of GDP per capita of regions in 2011 is almost same in 1987. The transformation of the national industrial policy from import substitution model to export oriented model has stimulated an increase in the volume of the foreign trade that attracts foreign investments, and thus, the income levels of the regions have increased. However, although per capita GDP has increased for all regions, the large disparities between regions have remained constant.

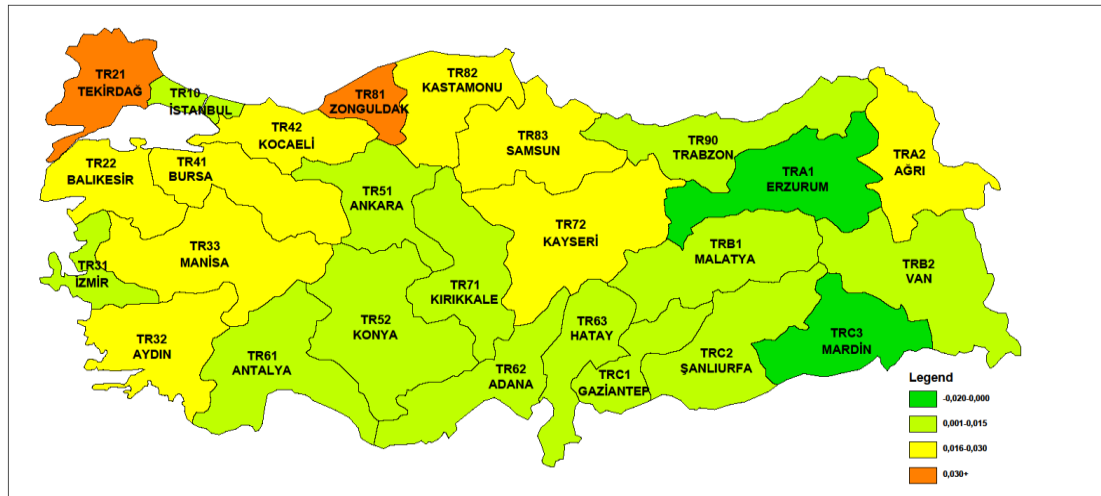
Figure 5.11. GDP per Capita by NUTS 2 Regions (1987 Fixed Prices), 2011



Source: Map created by author

Furthermore, the growth rates of GDP per capita of the regions have been examined in this study for three different periods such as for the years between 1987-2000, 2000-2011, and 1987-2011.

Figure 5.12. GDP per Capita Growth by NUTS 2 Regions, 1987-2000

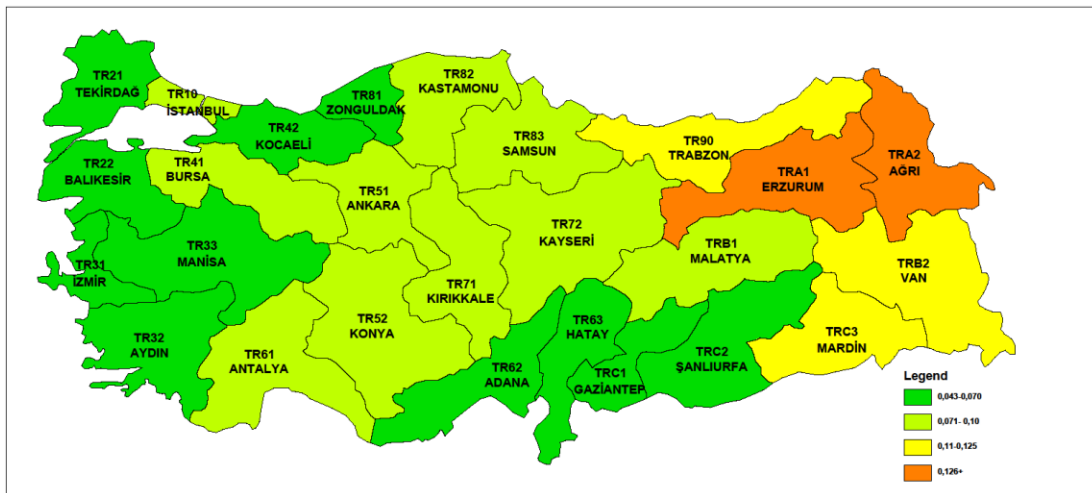


Source: Map created by author

As illustrated in the Figure 5.12 which demonstrates GDP per capita growth of regions for the period of 1987-2000, the regions in the western part of the country such as

Zonguldak and Tekirdağ have the highest rate of GDP per capita growth, whereas the Eastern Anatolian regions such as Erzurum and Mardin performing lowest rate of GDP per capita growth. The policies that aimed to increase exports during this period led to a high economic growth performance in regions where the industrial activity was concentrated. In contrast, regions with lower industrial activity had lower level of economic growth.

Figure 5.13. GDP per Capita Growth by NUTS 2 Regions, 2000-2011

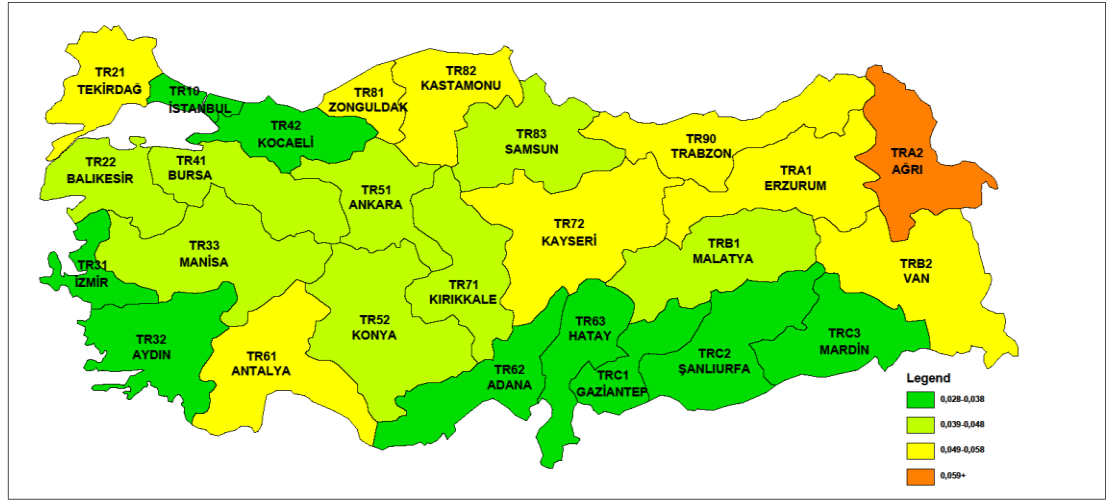


Source: Map created by author

Figure 5.13 indicates the geographical distribution of GDP per capita growth rates of NUTS 2 regions for the period of 2000-2011. During this period all regions have performed positive GDP per capita growth rate. However, in contrast to the previous period, NUTS 2 regions in the East Anatolia such as Ağrı and Erzurum have the highest GDP per capita growth rates. As seen in the figures the regions in the eastern part of the country have the higher growth rates than regions in the western part of the country.

The underlying reason behind this result is that the government after 1987 identified several regions, which mostly located at Southeast Anatolia, East Anatolia and Black Sea regions, as the priority areas for financial assistance. The government directed incentives and investments to stimulate the agricultural potential of these regions and made them an important export centre based on agriculture (Eraydn, 2002). Thus, regions located in this area demonstrated a significant performance.

Figure 5.14. GDP per Capita Growth by NUTS 2 Regions, 1987-2011



Source: Map created by author

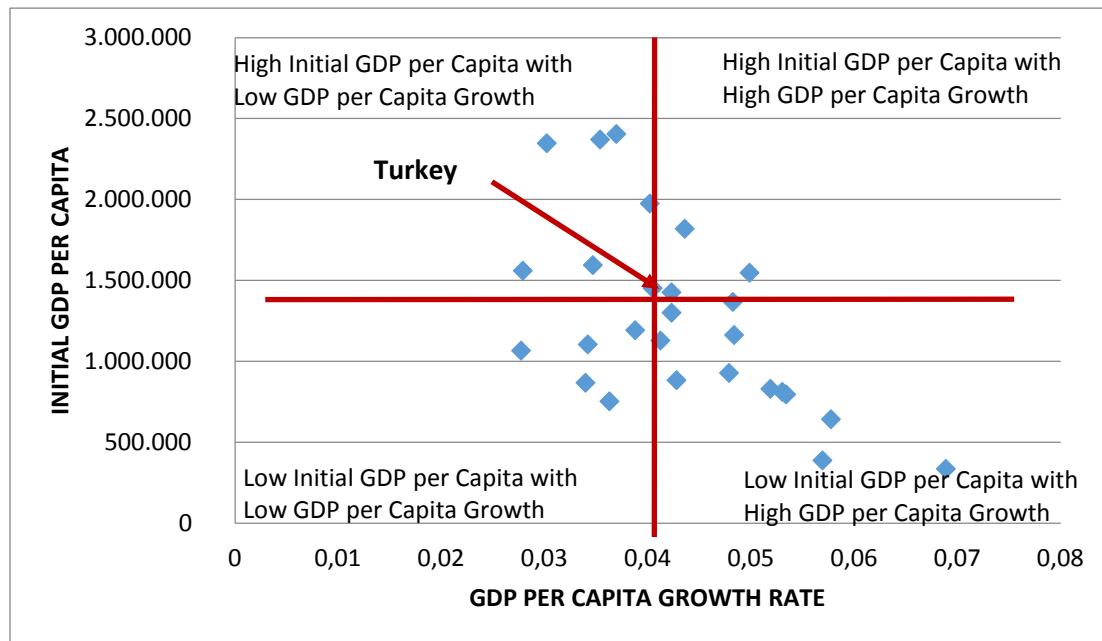
In addition, the GDP per capita growth performance of the NUTS 2 regions for whole period which covers over the period 1987-2011 have been demonstrated in the Figure 5.14. As can be seen in the figure, the regions in the Eastern Anatolia Region and Black Sea Region have the higher rates of GDP per capita growth than regions in the Marmara, Aegean, Mediterranean and South East Anatolia Regions. As indicated above, the incentives and investments directed by the state have increased the performance of less developed regions. At the NUTS 2 level, while Ağrı, Erzurum and Van have the highest GDP per capita growth rate, İzmir, Adana, and Gaziantep have performed lowest economic growth rate.

Figure 5.15 demonstrates the economic performance of the regions by comparing their initial GDP per capita and their GDP per capita growth rate between the years 1987-2011. In this respect, the regions have been categorized into four groups:

- Regions with low initial GDP per capita and high GDP per capita growth rate,
- Regions with high initial GDP per capita and high GDP per capita growth rate,
- Regions with low initial GDP per capita and low GDP per capita growth rate,
- Regions with high initial GDP per capita and low GDP per capita growth rate.

As can be seen in the Figure 5.15 although the majority of the regions have lower initial GDP per capita than Turkey's initial GDP per capita, they have performed the higher GDP per capita growth rate than Turkey's average. As illustrated above, the regions having high initial GDP per capita like İstanbul, Kocaeli, and İzmir have lower economic growth rate than regions having low level of initial GDP per capita. All these support the convergence theory. On the other hand, about five regions showed a performance below the average of Turkey. Besides, there were only three regions with high initial GDP per capita experienced higher growth rate.

Figure 5.15. GDP per Capita (1987, TL) and GDP per Capita Growth (1987-2011) by NUTS 2 Regions



5.3. Employment and Unemployment

Employment

Since the Birch's (1981) question "who creates job" the attentions paid on the relationship between entrepreneurship and employment generation have substantially increased. In particular, after the 1970 crisis which caused to the questioning of Fordist type production, the innovative advantages passed from large enterprises to new and small enterprises that stimulate the increase of entrepreneurial activities across regions and countries. Starting from this, in recent three decades many researchers and policy-makers conducted various empirical studies to explore the impact of entrepreneurship on regional or national employment. The mainstream of the literature on entrepreneurship demonstrates that entrepreneurship by definition generates new businesses which mean new demands for labour markets. Through the formation of new businesses additional capacities will be generated in the market and thus new employment opportunities will arise for individuals. In this respect, the employment structure of Turkey at NUTS 2 level is examined in this sub-section.

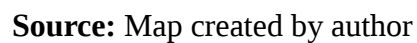
Data on employment are taken from Turkish Statistical Institute and it is available for the years 1985, 1990, 2000 and the period of 2004-2014 for the NUTS 2 regions. The employment data consists of both part- and full-time employees. Unpaid family workers and self-employed workers are excluded from the data. Changes in NUTS 2 regions' employment are expressed in percentages. The employment rate of each region is derived by dividing total number of employees by total number of labour force.

Figure 5.16 demonstrate the changes in the number of employment for the years over the period of 1988 and 2013. As indicated in the figure, the number of employment increases slowly with 0,014 growth rate. Employment growth can be examined in four periods: 1988-1993 and 2004-2009 slow growth period, 1994-2003 stagnation period, and 2009-2013 fast growth period. In addition, during the crises periods, employment has negative growth rate. It also has a similar growth path with GDP per capita.

Line chart showing Employment from 1988 to 2013. The Y-axis represents the number of employees, ranging from 0 to 3,000,000. The X-axis represents the years. The line shows a general upward trend with some fluctuations, starting around 1,800,000 in 1988 and reaching approximately 2,550,000 in 2013.

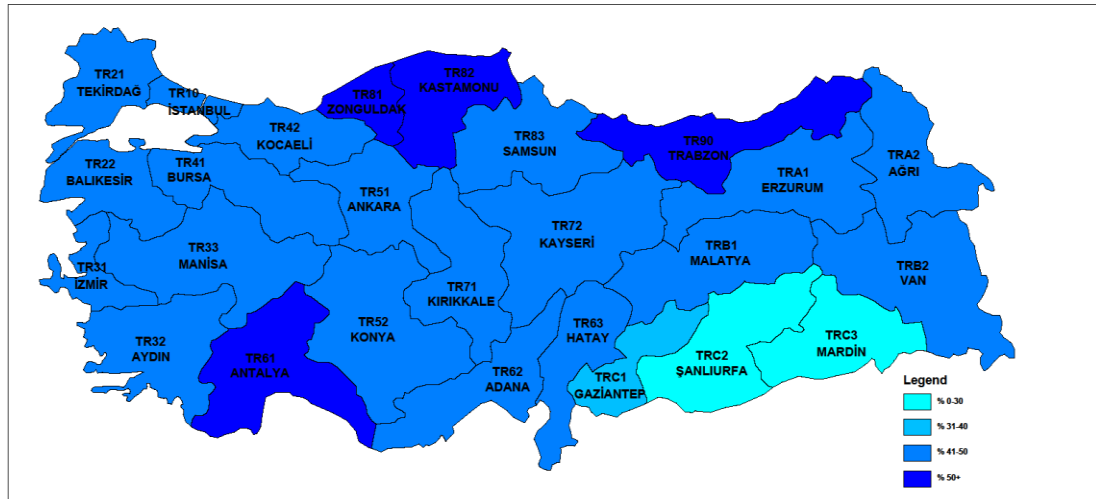
Year	Employment
1988	1,800,000
1989	1,850,000
1990	1,880,000
1991	1,950,000
1992	1,980,000
1993	1,880,000
1994	2,000,000
1995	2,050,000
1996	2,120,000
1997	2,120,000
1998	2,180,000
1999	2,200,000
2000	2,150,000
2001	2,150,000
2002	2,120,000
2003	2,100,000
2004	1,980,000
2005	2,000,000
2006	2,050,000
2007	2,100,000
2008	2,120,000
2009	2,120,000
2010	2,250,000
2011	2,400,000
2012	2,450,000
2013	2,550,000

Figure 5.17. Rate of Employment by NUTS 2 Regions, 1985



According to 1985 data²⁶, as indicated in Figure 5.17 regions with the highest rate of employment at the NUTS 2 level are located at Black Sea and East, Southeast and Central Anatolia. In contrast, the regions with the highest GDP per capita have the lowest rate of employment. The main reason behind this is the inclusion of agricultural employees into total employment. Therefore, the employment rates were found higher in regions with higher numbers of agricultural workers.

Figure 5.18. Rate of Employment by NUTS 2 Regions, 2011



Source: Map created by author

The 2011 employment data shows that regions located in the Black Sea, Mediterranean and Aegean Regions have higher rates of the employment than regions in the Central Anatolia and Southeast Anatolia. The Figure 5.18 indicates while Kastamonu and Trabzon has the highest employment rate, Şanlıurfa and Mardin have the lowest employment rate.

As compared the previous period, due to excluding the agricultural employees in total employment, the employment rates of regions which especially concentrate on agriculture sector and located in eastern and southeast of the country declined.

²⁶ The non-agricultural employment data for the year 1985 is not available.

Unemployment

Unemployment is another important indicator of economic development. The relationship between entrepreneurship and unemployment is complicated. According to the entrepreneurship literature, there are three different relations between entrepreneurship and unemployment (Baptista and Thurik, 2007; Thurik, 2008; Gohmann and Fernandez, 2014). At first, when unemployment rates rise, individual with low prospect for employment alternatives may be pushed into self-employment that results in positive relationship between unemployment and entrepreneurship (push effect). On the other hand, as the rates of unemployment increase which generally cause a depressed economy, the demand for services and goods will decline, thus the chance of individuals to start their own businesses will decline, this results in a negative relationship between self-employment and unemployment (pull effect). Finally, greater rates of entrepreneurship can lead to future increases in new jobs, thus reducing the rates of unemployment in the long-run (entrepreneurial effect). In general, as a source of regional economic development and new businesses, entrepreneurship has been widely accepted as a solution against unemployment problem in a variety of regions and countries.

In this respect, to analyze the relationship between regional entrepreneurial activity and unemployment, the data of unemployment has been used in this study. Data on unemployment were obtained from Turkish Statistical Institute. The data is available for the years 1985, 1990, 2000, and the period of 2004 to 2014 for the regions at NUTS 2 level.

The Figure 5.19 demonstrates the changes in the number of unemployment in Turkey for the period of 1988-2013. While at the beginning of this period the unemployment rate of Turkey was 9.22%, it reached to the peak and become 16.31% in 2009, and then it gradually declined and become 10.76% in 2013. The figure indicated that during the crisis periods the rates of unemployment increase that may result from high rates of firm deaths. On the other, the rates of unemployment decreased during recovery period implying high levels of new business formation.

Figure 5.19. Changes in the numbers of unemployment in Turkey, 1988-2013



Source: Turkish Statistical Institute (TurkStat)

Figure 5. 20. Rate of Unemployment by NUTS 2 Region, 1985

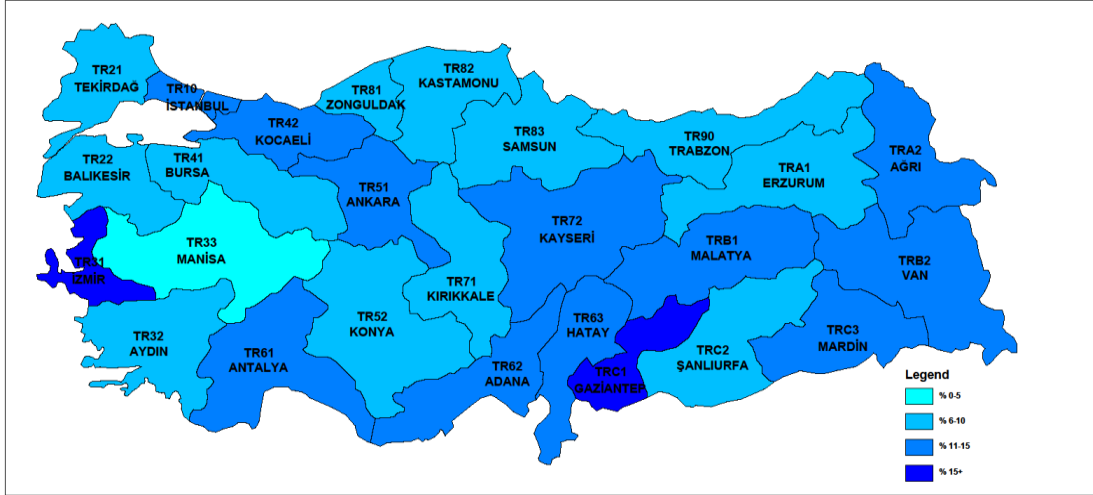


Source: Map created by author

Figure 5.20 shows the variations in the rate of unemployment across NUTS 2 regions of Turkey for the year 1985. According 1985 unemployment data, the regions with the higher level of GDP per capita such as İstanbul, Ankara and İzmir, and the regions located in the south of the country have the highest level of unemployment. On the other

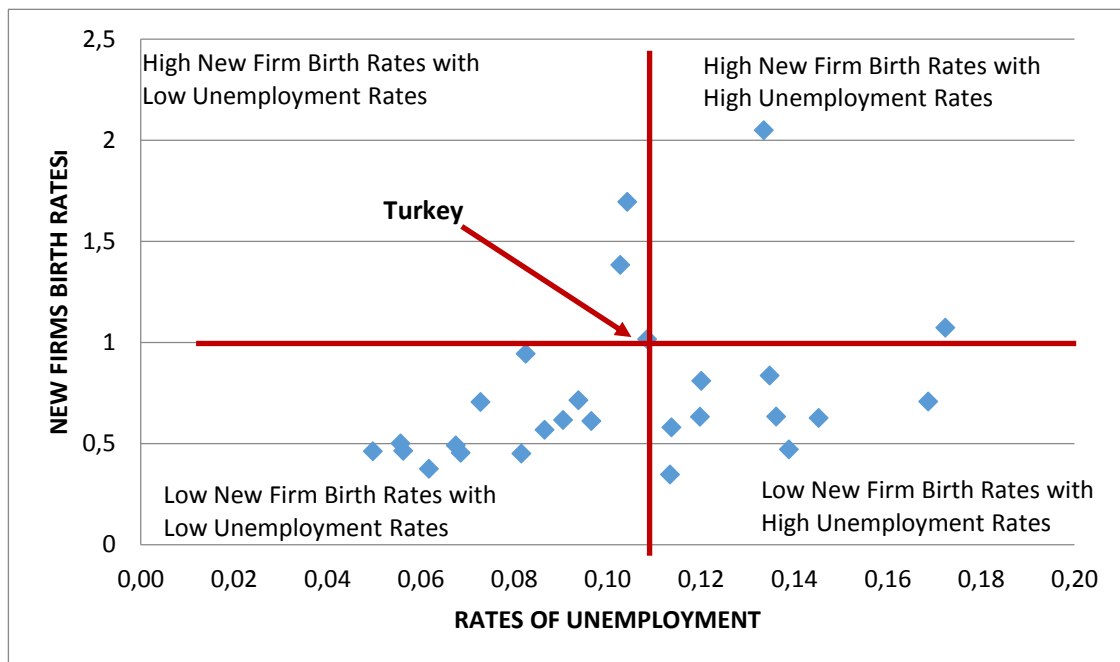
hand, Balıkesir, Aydın and Kastamonu with the 2% had the lowest unemployment rates. In fact, the formation of this pattern may result from the inclusion of agriculture into the employment data. Therefore, the rate of employment in the total employment is lower in regions with higher number of agricultural workers.

Figure 5. 21. Rate of Unemployment by NUTS 2 Region, 2011



According to the figure, although many regions have low rates of new firm formation they have low levels of unemployment. Due to having low population growth rates, unemployment rates might remain at low levels in such regions. On the other hand, many regions with low levels of entrepreneurial activity have high rates of unemployment. This result is parallel with the discourses in the entrepreneurship literature, referring that regions with low levels of entrepreneurial activity may have high levels of unemployment. It is likelihood that due to having high rates of firm exit in such areas the rate of unemployment increased. However, there are only one region (İstanbul) with high firm birth rates and high unemployment rates. This is due to the fact that excessive migration in such areas resulted in unexpected population growth and thus the unemployment rates of these regions may be too higher.

Figure 5.22. Firm Birth Rates and Unemployment Rates by NUTS 2 Regions, 2011



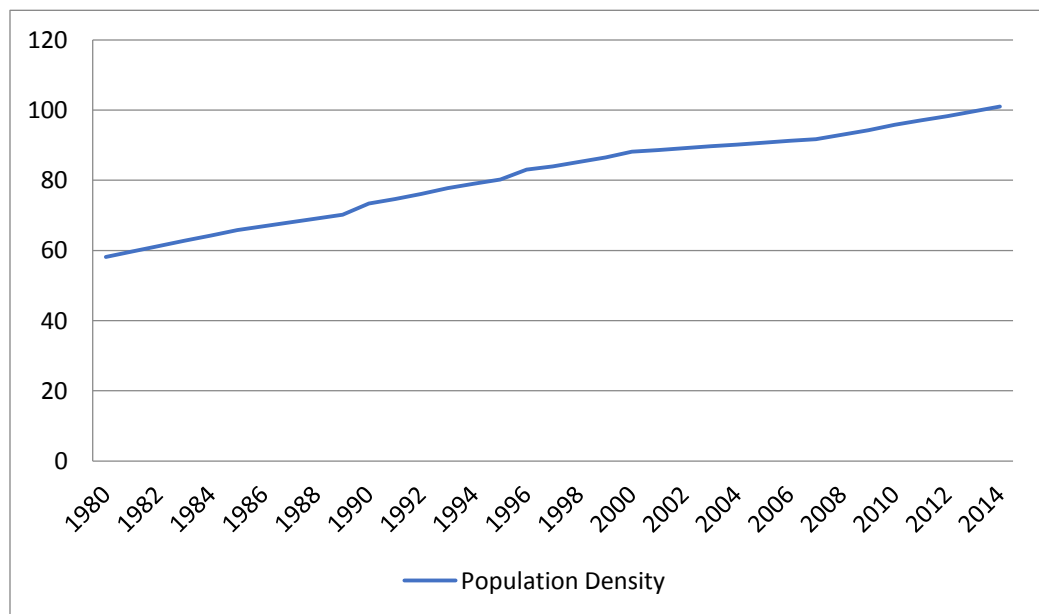
5.4. Demographic Composition

Population Density

Through providing various economic advantages (i.e., market proximity, advanced business infrastructures, information and knowledge spillover) and supplying more favourable incumbent conditions (i.e., an easy access to technological developments, research centres, financial capital and educated labour force) for new firms, areas with dense population stimulate the formation of new businesses more than areas with less population (Audretsch and Fritsch, 2002). Within this framework, population density is usually used as a measure of agglomeration (Henderson, 2006; Fritsch and Mueller, 2008). Therefore, population density is included as a factor in this study.

Population density is obtained by dividing the total population by total square kilometre areas. Both the data of regional population and area are taken from TurkStat for the period of 1980-2014. The data available both for national and regional (NUTS 2) level for this time period. Depending on population growth, the population density of Turkey has increased from 58 (p/km²) in 1980 to 101(p/km²) in 2014. The population density of Turkey followed a linear growth trend (Figure 5.23).

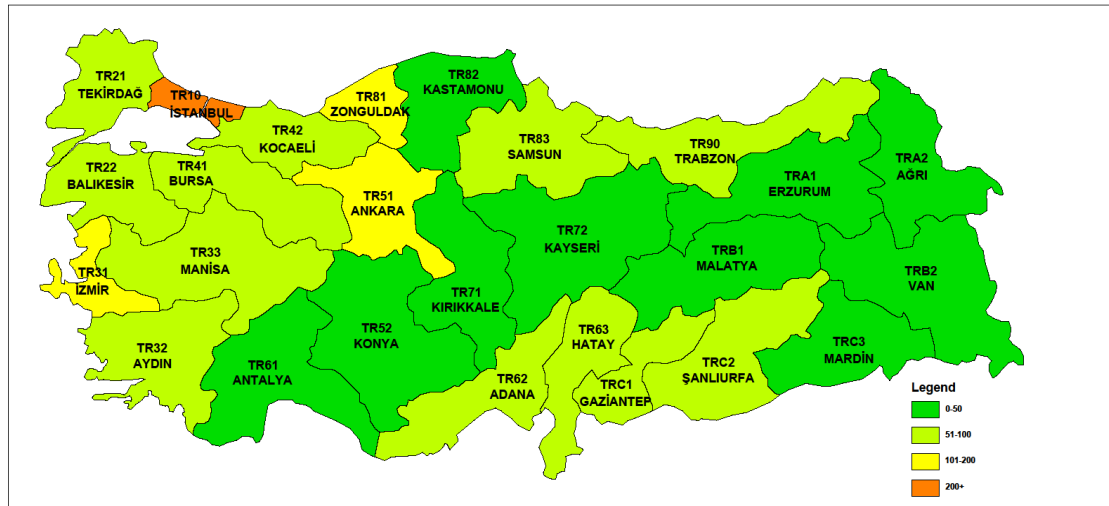
Figure 5.23. Changes in Population Density of Turkey, 1980-2014



Source: Turkish Statistical Institute (TurkStat)

Figure 5.24 demonstrates the geographical distribution of population density across NUTS 2 regions of Turkey for the year 1985. According to this data, the regions having the highest levels of population density are İstanbul, Zonguldak, Ankara, and İzmir, whereas Van, Kırıkkale, and Erzurum have the lowest population density. There is a huge difference between the highest (which is İstanbul having 1125 p/km²) and the lowest (which is Erzurum with 28 p/km²) population density. The major industrial investments and wrong agricultural policies which resulted in mass migration are the most important factors behind this huge difference. The population density maps and the new firm formation maps are greatly overlapping that confirm the arguments in the literature.

Figure 5.24. Population Density by NUTS 2 Regions, 1985



Source: Map created by author

Although the population density pattern does not change much more in 2011, the differences in population density across regions have considerably increased (Figure 5.25). For instance, while the population density of Erzurum has declined from 28 (p/km²) in 1985 to 26 (p/km²) in 2011, the population density of İstanbul has increased from 1125 (p/km²) to 2622 (p/km²). The population density maps also coincide with the entrepreneurial activity maps for this period. All these indicate that wrong policies and inadequate investments regarding less developed regions have led to a further increase in regional disparities during this period (1985-2011).

Figure 5.25. Population Density by NUTS 2 Regions, 2011



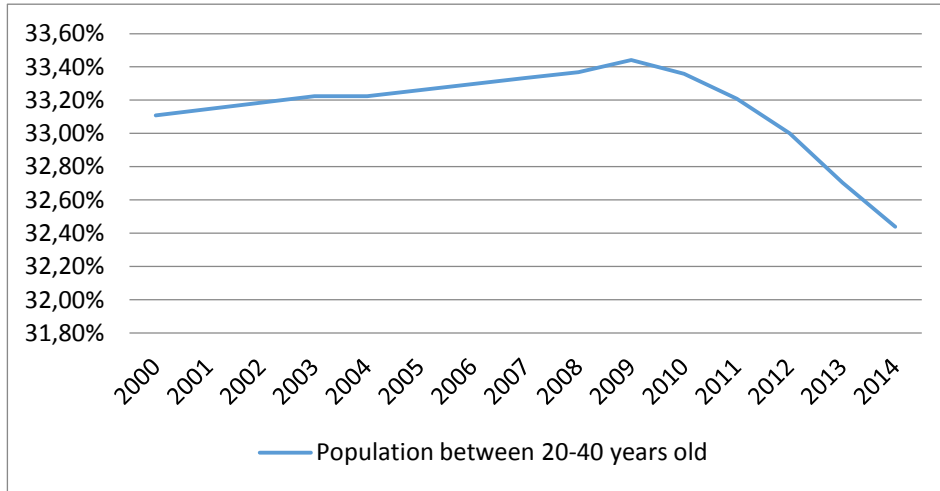
Source: Map created by author

Age Groups

Another important demographic variable is the percentage of population between 20 to 40 years old. Empirical studies using demographic indicators have demonstrated that the likelihood of starting new businesses is higher among individuals in this age group. As indicated in theoretical chapter, in general, people start a new venture in their thirties. As it is highly-likely that with age individuals gain self-reliance, professional experience, speciality, social and professional networks, knowledge, and financial capital which are the essential factors for starting new businesses. On the other hand, because incomes from paid-employment rise with age and the likelihood of obtaining less incomes from self-employment, older people may avoid taking risks, and thus starting new businesses. In this respect, population between 20 and 40 years old has been considered as the potential entrepreneurs, and thus, it is added in this study.

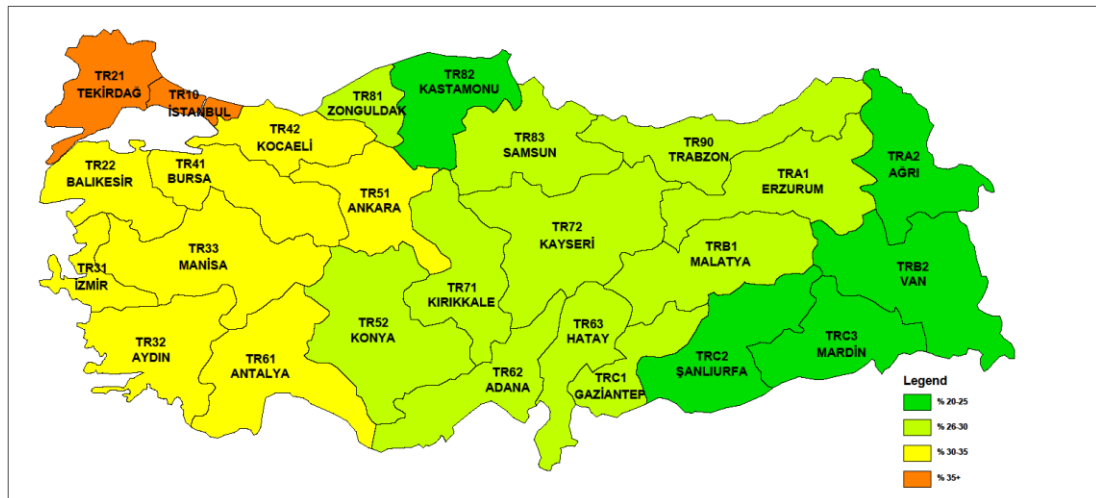
Data of age groups are obtained from TurkStat covering the years 1985, 1990, and the period of 2000 to 2014. It is available for these years both at national and regional (NUTS 2) level. As can be seen in Figure 5.26 there are no huge differences between the shares of population between 20-40 years old during this period. However, depending on the population of Turkey which has started to aging, the share of this age group in total population has begun to decline since 2009.

Figure 5.26. Share of population between 20-40 years old in Turkey, 2000-2014



Source: Turkish Statistical Institute (TurkStat)

Figure 5.27. Share of population between 20-40 years old by NUTS 2 Regions, 1985



Source: Map created by author

According to 1985 data, the share of 20-40 age group in total population gradually decreased from east to west of Turkey. While Tekirdağ and İstanbul approximately with 36 percent have the highest share of this age group, Ağrı, Van, and Mardin with 23 percent have the lowest share. Although the eastern regions have the high birth rates, high rates of out-migration (from east to west) has caused to a decline in the share of

this age group in such regions. The geographical representation of this age group can be observed in Figure 5.27 for the year 1985.

Figure 5.28. Share of population between 20-40 years old by NUTS 2 Regions, 2011



Source: Map created by author

Figure 5.28 demonstrates the variation in the share of population in 20-40 age groups by NUTS 2 regions for the year 2011. As compared the previous period, the pattern of share of population between 20-40 years old has slightly changed, yet regions having higher GDP per capita and entrepreneurial activity have higher share of this age group.

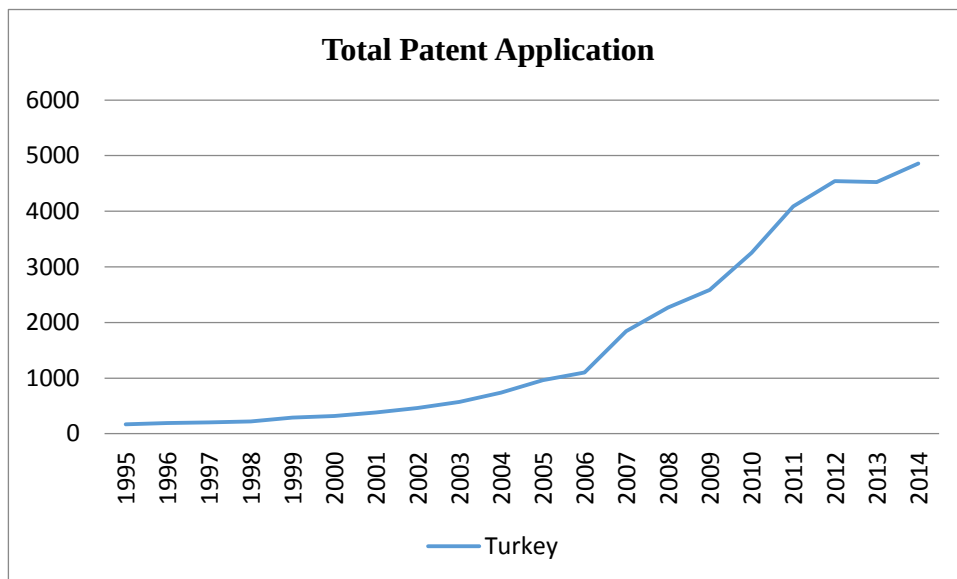
5.5. Resource of the Regions

Innovation

Entrepreneurs are widely considered as the source of changes and innovations that lead to productivity enhancements and economic competitiveness. According to the literature, because technological development is necessary to boost the efficiency of resource and growth, technological improvements are seen as the primary source of economic development. Thus, technological developments and innovation have become the most important determinants of regional economic growth. In this regard, the levels of technological developments and innovative activities are included in this study.

The empirical literature has used different measures of innovation. The most common measures of innovation are the number of patents, total R&D expenditures, the percent of productions that occur with high-tech sector, and the share of high-tech firms (Camp, 2005). In this study, the numbers of patents have been used as a measure of innovation. Data of innovation were obtained from Turkish Patent Institute which is available for the period of 1995-2014 both at national and regional (NUTS 2) levels. The innovation capacity of the regions has been found by dividing the number of patents by total population and then multiplied by a hundred thousand.

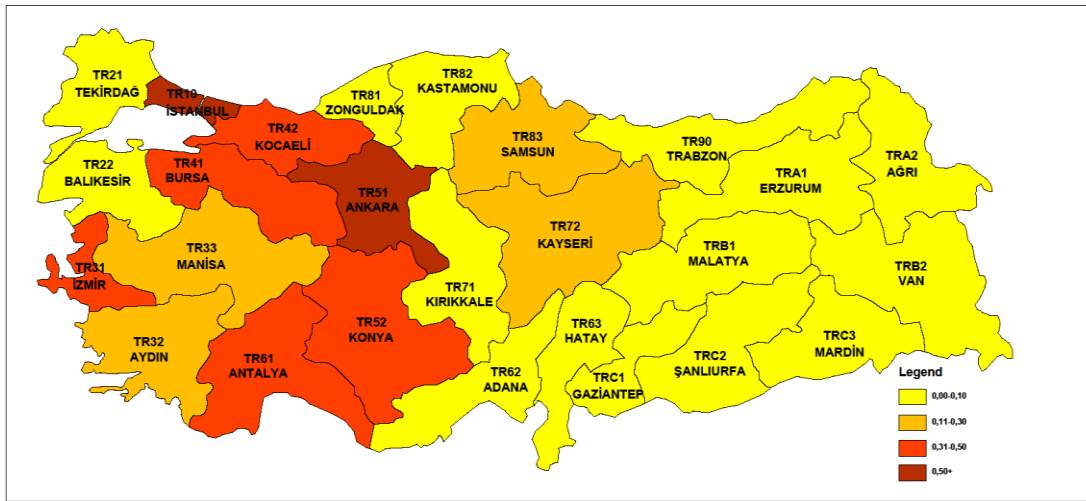
Figure 5.29. Changes in the Number of Patent Applications in Turkey, 1995-2014



Source: Turkish Patent Institute

Figure 5.29 demonstrates changes in the number of patent applications in Turkey for the period of 1995 and 2014. During the first ten years the number of patent applications increased slowly, but in the second half of the period Turkey has experienced a considerable increase in the number of patent applications. This can be explained with an increase in the number of universities and techno parks in Turkey.

Figure 5.30. Patent Applications per One Hundred Thousand Populations by NUTS 2 Regions, 1995

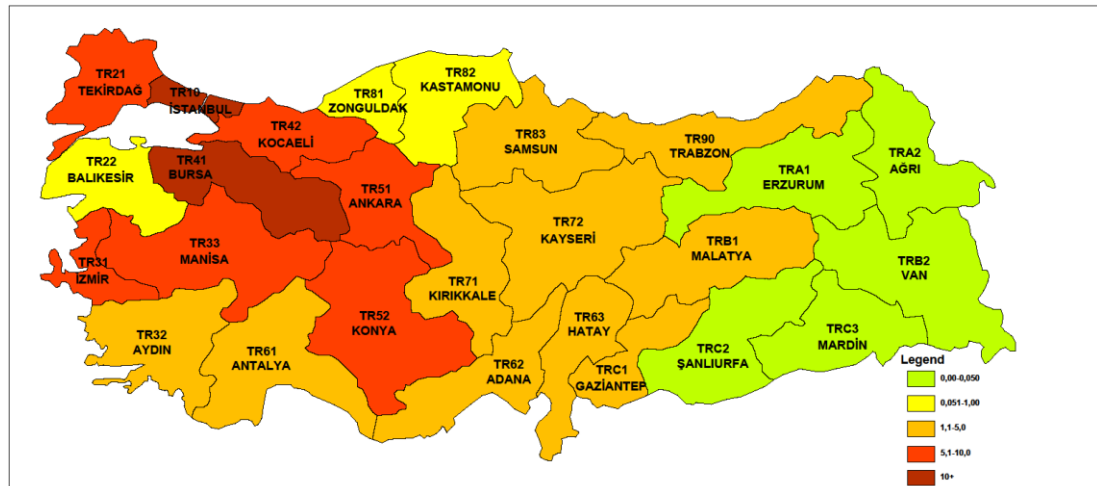


Source: Map created by author

Figure 5.30 indicates the regional distribution of patent applications per one hundred thousand population by NUTS 2 regions for the year 1995. According to this data, the regions have the higher number of universities during this period also have the highest numbers of patent applications. In this respect, Ankara, İstanbul, İzmir, Kocaeli, and Bursa have the highest numbers of patent applications. On the other hand, there were nine regions that have zero patent applications. In fact, during this period most of the provinces of Turkey did not have any university and had limited number of university graduates.

According to 2011 data, the numbers of patent applications have considerably increased almost all regions. However, there were no patent applications in the two NUTS 2 regions which are mostly located at the east of Turkey. As can be seen in the Figure 5.31 the levels of innovative activities have gradually declined from east to west of the

country. As indicated before, regions with higher numbers of universities and techno parks have higher levels of innovative activity. In this regard, Bursa, Manisa, İstanbul, Kocaeli, and Tekirdağ have the highest rates of innovation.

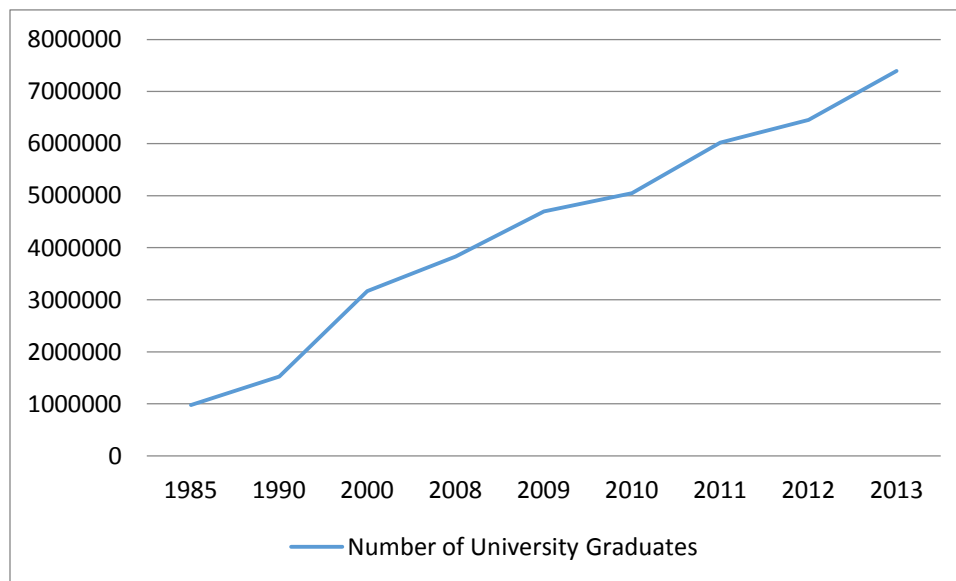


Human Capital

Data on employment are taken from Turkish Statistical Institute which covers the years 1985, 1990, 2000, and the period of 2008-2013. It is available for both at national and regional level. As many researchers stressed the importance of education and training for the formation of human capital, the share of university graduates in total population has been used as the most common measure of human capital in the empirical literature. Therefore, share of university graduates has been used as a proxy of human capital in this study.

According to the national data of human capital, since 1985 the numbers of university graduates have substantially increased in Turkey. In 1985, the number of universities was limited (about 20) and mostly located in big cities, whereas in 2011, the number rapidly increased (reached about 180) and distributed to all of the cities. Thus, the share of people with university education in total population has a tendency to increase each year (Figure 5.32).

Figure 5.32. Changes in the Number of Universities Graduates in Turkey, 1985-2013



Source: Turkish Statistical Institute (TurkStat)

Figure 5.33 indicates the variations in the share of university graduates across NUTS 2 regions for the year 1985. According to 1985 data, the big cities like Ankara, İstanbul, and İzmir have the highest share of university graduates. As mentioned above, due to the

limited number of universities the share of university graduates is considerably low in the other regions especially those located in East and Southeast Anatolia for this period. The pattern of university graduates is similar to the pattern of innovative capacity of regions.

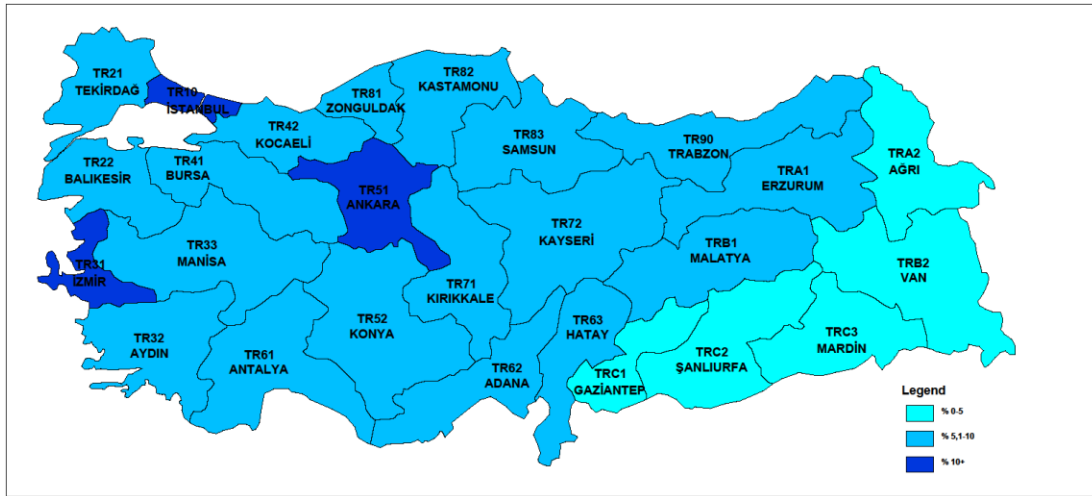
Figure 5.33. Share of University Graduates by NUTS 2 Regions, 1985



Source: Map created by author

As compared to previous period, in parallel to increase in the number of university, the share of university graduates increased in all regions, however; the regional differences in the share of university graduates remained constant. In addition to İstanbul, Ankara, and İzmir, regions located in Marmara, Aegean, and Mediterranean had also higher levels of human capital (Figure 5.34). For example, while Ankara with 14.80 percent had the highest share of university graduates, Van and Şanlıurfa with 3.58 percent have the lowest human capital level. The main reasons behind this difference are that the lack of socio-economic opportunities and the cultural structure of the regions, referring lack of emphasis on education in regions in the eastern part of Turkey.

Figure 5.34. Share of University Graduates by NUTS 2 Regions, 2011



Source: Map created by author

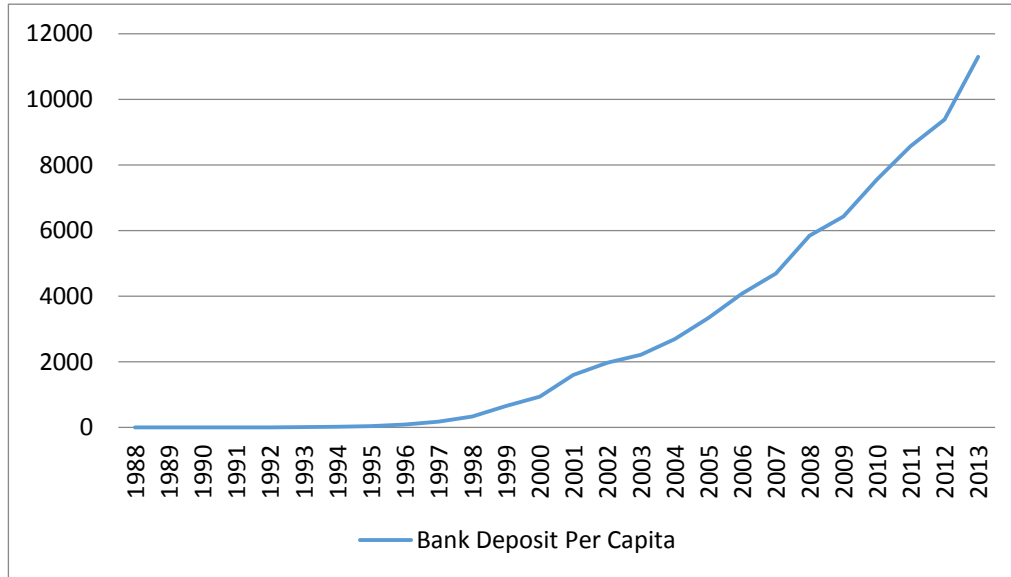
Financial Capital

The availability of and access to financial capital such as angel investors, venture capital, and bank deposits are crucial for the regional entrepreneurial activity because during the establishment process of new firms entrepreneurs mostly need an additional financial resources. Therefore, the financial capital of regions is an important determinant for regional entrepreneurship. In this sense, it is included in this study.

Due to the availability of data, bank deposit per capita is the commonly used measure of financial capital. Data on financial capital are taken from the Banks Association of Turkey which is available for the period of 1988 to 2013 for the NUTS 2 regions.

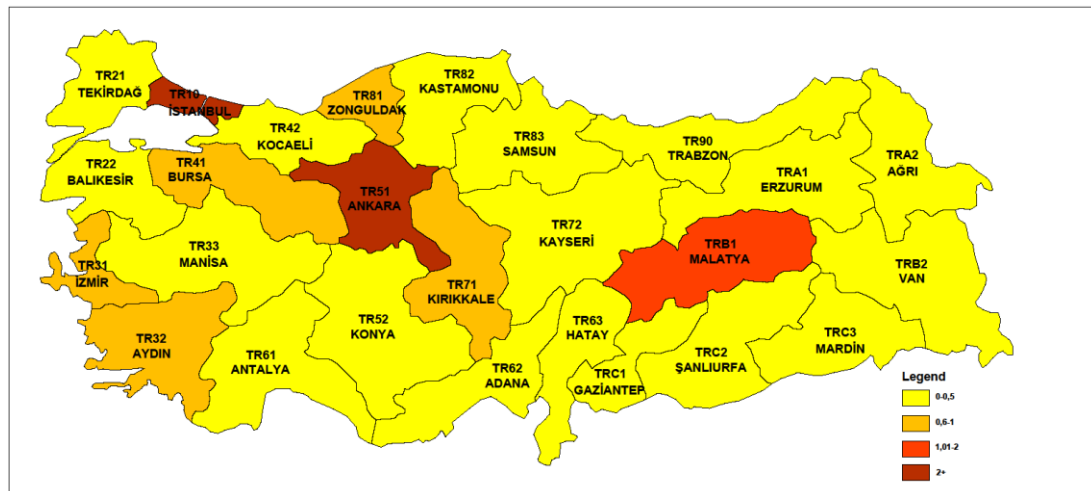
Figure 5.35 shows the changes in bank deposit per capita over the period of 1988-2013. As can be seen in the figure Turkey has experienced a substantial increase in deposit per capita. The growth pattern of bank deposit per capita can be examined in two periods: at first a slowly increasing trend was observed during the period of 1988-1997, secondly, a sharply increasing trend was followed between 1998 and 2013. Bank deposit per capita was only 0.74 Turkish Lira (TL) in 1988, whereas it increased rapidly and became 11 292 TL in 2013.

Figure 5.35. Changes in Bank Deposit Per Capita in Turkey, 1988-2013



Source: The Banks Association of Turkey

Figure 5.36. Bank Deposit per Capita by NUTS 2 Regions, 1988

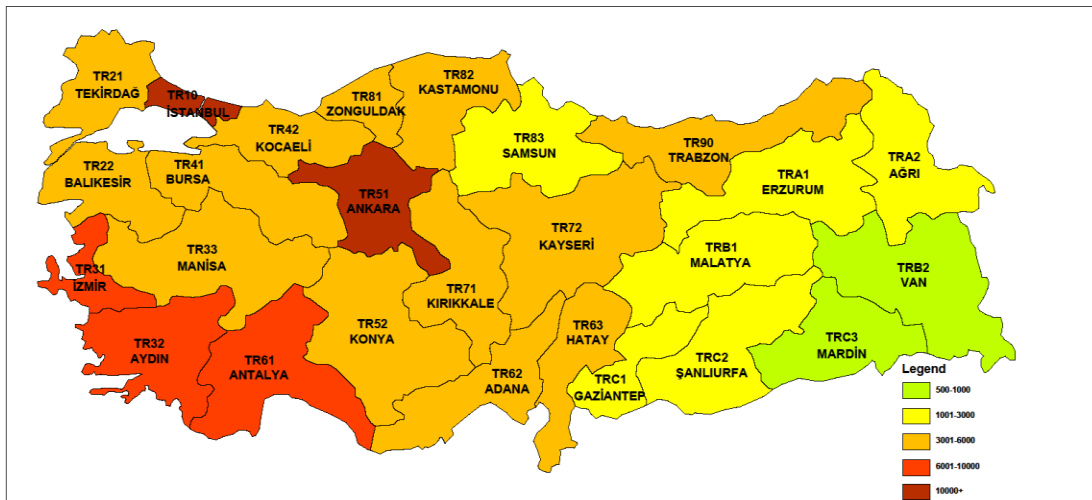


Source: Map created by author

Figure 5.36 demonstrates the spatial variations in bank deposit per capita across NUTS 2 regions for the 1988. According to 1988 data, except Tunceli, as occurred in many cases the specific metropolitan regions (İstanbul, Ankara, İzmir, Bursa, and Kocaeli) had the highest levels of financial capital. Due to the high concentration of economic, social and cultural activities in these regions, they have higher bank deposit per capita. While the

bank deposit per capita was 2.2 TL in İstanbul and Ankara, it was only 0.1 TL in Van, Mardin, and Şanlıurfa. This pattern is highly overlapping with the pattern of new firm formation in 1990.

Figure 5.37. Bank Deposit per Capita by NUTS 2 Regions, 2011



Source: Map created by author

In 2011 the levels of bank deposit per capita have substantially increased for all regions. However, there is a huge difference between the highest and lowest values (i.e. 22.883 TL vs 981 TL in 2011). In addition, although the variation between lowest and highest value remained constant, the number of regions with higher amounts of bank deposit per capita increased. Other than big regions, regions located Aegean and Mediterranean region also have a considerable amount of bank deposit per capita (Figure 5.37).

CHAPTER 6

METHODOLOGY

6.1. Aim and Context of the Study

The main objective of this thesis is to investigate the relationship between entrepreneurship and regional economic development/growth. As indicated in Chapter 3, with the collapse of many economies based on Fordist-type production, entrepreneurship has been widely recognized as the main driver of economy. Particularly, since the 1970 crisis, many researchers and policy makers have paid an increasing attention on the role of entrepreneurship in national and regional economic development. The mainstream literature indicated that entrepreneurship plays a vital role in regional economic development process. The study aims to find out the main factors behind the diverse impacts of entrepreneurship on regional economic development and to explore the determinants influencing regional entrepreneurship.

In line with the entrepreneurship literature discussed above the following research questions constitute the core of this thesis:

1. How does entrepreneurship contribute to regional economic development?

Depending on the first research question, the main hypothesis of the study is that

- **(H-1): “Regions with higher levels of new businesses formation or self-employment have higher degree of economic growth since entrepreneurs stimulate demand for products of related enterprises and supply of inputs and create new employment opportunities for labour, which generate residentiary effects on the regional economy”.**

2. *Why do the effects of entrepreneurship on regional economic development differ across regions?*

Based on the second research question the following hypothesis is suggested:

- **(H-2): “While new business formation creates a positive longer-term effect on economic development in regions at the advanced stage of economic development, entrepreneurial activity can have negative consequences on economic development in regions at the early or middle stage of economic development, and therefore, a U-shaped relationship between entrepreneurial activity and regional economic development level is expected”.**
- 3. *What are the impacts of certain regional economic, demographic, and social characteristics on regional entrepreneurship?***

According to the literature, entrepreneurial activities and entrepreneurship rates are substantially differ across countries and even between regions in the same countries. Although some countries or regions have similar levels of income, the formations of new business in these areas show great differences. This hypothesis is focused on the main determinants of the differences in the level of regional entrepreneurial activity.

- **(H-3a): “The level of entrepreneurial activity is defined by the regions with different level of resources, including population, educational attainments, human capital, financial capital, and demographic composition. While population density is positively associated with the high rates of regional entrepreneurship, due to more intense competition both at the input and output markets this relation can be negative in densely populated regions. Regions with higher population between the age of 20 and 40 have higher levels of start-ups activities. The probability of starting new businesses may differ among men and women. Due to having less financial capital, work experience, and difficulties in accessing loans women have lower propensity than men to start a new business. Therefore, regions with higher ratio of female may have lower levels of entrepreneurial activities. Also, it is**

expected that regions with higher share of immigrant population may have higher level of new business formation and entrepreneurial activity. Besides, the presence of educational attainments, human capital, and financial capital in a region stimulates the formation of new businesses in the respective region.”

- (H-3b): “The economic characteristics of the regions including the rate of growth in demand in different products, existing clusters/agglomerations in various sectors and the composition of the economic and manufacturing sectors have considerable impacts on the regional entrepreneurial activity. With the increase of individuals’ incomes the more capacity of spending and a greater demand for new and differentiated products and services take places that generate new business opportunities and stimulate entrepreneurial activities in a region. Thus, the growing diversity in demands has been an important factor affecting positively new business formation in the regions. In addition, due to providing rich and diverse labour pool, input-output linkages, innovative activities and knowledge spillover, clusters/agglomerations have been considered as the crucial factor of increasing entrepreneurial activity in an area. Furthermore, it is expected that a high level of new firm formation or entrepreneurship can be expected in regions with relatively a high share of employment in smaller firms/businesses and in the service sector, rather than large firms and manufacturing sector”.
- (H-3c): “As entrepreneurial culture generates a positive public attitude towards entrepreneurship and the social acceptance of them, it will increase the likelihood of individuals becoming self-employment or starting a business. There is a positive relationship between the higher rates of existing entrepreneurship and the higher levels of new businesses formation in a region. The high levels of entrepreneurship in a region provides new opportunities and creates conducive environment and offer role models to

individuals who have entrepreneurial intention, entrepreneurial culture, in general, has a positive impact on new business formation.

All these questions and hypotheses have been addressed at 26 NUTS II regions of Turkey for three different periods: 1987-1990, 1990-2000, and 2000-2011.

6.2. Research Design and Empirical Models

As mentioned earlier, this thesis has three main objectives. The first aim of this thesis is to investigate the effect of entrepreneurship on the economic growth and development of 26 NUTS II regions in Turkey for the periods of 1987-1990, 1990-2000, and 2000-2011(the first research question). The regional economic development level is measured by GDP per capita. Although the thesis aimed to use other measures of economic development, due to the lack of data for the respective periods GDP per capita is used in this study. On the other hand, changes in GDP per capita and in total GDP of regions are used to measure economic growth rate. Based on previous literature, this study employs the regional economic growth models in investigating the relationship between entrepreneurship and regional economic development.

In order to estimate the regional economic development/growth the following function was constructed.

- Firstly, the regional level of economic development is described as the Gross Domestic Product per capita (GDPpc) for the years 1990, 2000, and 2011. The first equation is defined as a function of firm birth rates both in total firms and labour force (BIRTH_TF and BIRTH_LF), changes in the numbers of firm births (CHBIRTH_LF), firm death rates (DEATH_LF), and self-employment rates (SLFEMP_LF). It is hypothesis that the level of regional economic development, defined as GDP per capita, and entrepreneurship proxies which are firm birth rates and self-employment rates have a positive relationship, whereas it is negatively linked to the rates of firm deaths.

The GDP per capita equation also includes other socio-economic variables which are used in the previous empirical studies. For example, establishment size (ESTBSIZE), rates of small and medium enterprises (SMEs), labour force (AGE_14-64), human

capital (UNI_GRDTS and HGHSCH_GRDTS), financial capital (BNKDEPSTpc), and other variables.

It is hypothesized that GDP per capita has a positive relationship with SMEs, UNI_GRDTS, and BNKDEPSTpc. On the other hand, because unemployment represents less economic opportunities and crime creates a bad reputation for regions, it is hypothesized that UNEMPL and CRIME have a negative link with GDPpc. In addition, it is expected that regions with high rates of innovative activities have higher level of economic development. Also, it is hypothesised that the presence of free trade zone (FRTRDZONE), which increases economic activities in an area, and techno parks as centre of innovation and technological development in a region will contribute to the further economic development of regions.

$$\begin{aligned}
 \text{EQ 1: } GDPpc = & \beta_0 + \beta_1 BIRTH_TF + \beta_2 BIRTH_LF + \beta_3 CHBIRTH_LF + \beta_4 DEATH_LF + \\
 & \beta_5 SLFEMP_LF + \beta_6 ESTBSIZE + \beta_7 SMEs_TF + \beta_8 AGE_14-64 + \beta_9 UNI_GRDTS + \\
 & \beta_{10} HGHSCH_GRDTS + \beta_{11} NET_MIGRATION + \beta_{12} POPDEN + \beta_{13} UNEMPL + \\
 & \beta_{14} PATENTpc + \beta_{15} INNVpc + \beta_{16} CHINNVpc + \beta_{17} TECHPARK + \beta_{18} CRIME + \\
 & \beta_{19} FRTRDZONE + \beta_{20} BNKDEPSTpc + \varepsilon
 \end{aligned}$$

where β s are the coefficients or parameters to be estimated and, ε indicates random error terms.

- Secondly, the regional economic growth is measured as the changes in the value of Gross Domestic Products (GDPvGrthRt) for the periods of 1987-1990, 1990-2000, and 2000-2011. The economic growth equation is a function of entrepreneurial variables such as firm birth rates (BIRTH_TF and BIRTH_LF), changes in the numbers of firm births (CHBIRTH_LF), firm death rates (DEATH_TF and DEATH_LF), and self-employment rates (SLFEMP_LF). Similar to above equation, the GDPvGrthRt equation also contains several socio-economic variables. In addition to the above variables, the equation includes the changes in the rate of employment (CHEMPL). It is hypothesized that regional entrepreneurial activity which generate new demands in labour market has a positive impact on GDPvGrthRt, whereas a negative relationship is expected between the growth in GDP value and the rates of firm deaths. In addition, it is hypothesized that rates of small and medium enterprises (SMEs), labour force (AGE_14-64), human capital (UNI_GRDTS and HGHSCH_GRDTS), financial capital (BNKDEPSTpc), and

growth in employment (CHEMPL) are positively associated with regional economic growth (GDPvGrthRt). On the contrary, unemployment (UNEMPL) and crime rates (CRIME) are expected to have negative effects on regional economic growth rate (GDPvGrthRt). Due to increasing the competitiveness of regions it is hypothesized that innovative activities (INNVpc and PATENTpc) has a positive influence on regional economic growth (GDPvGrthRt).

$$\text{EQ 2: } GDPvGrthRt = \beta_0 + \beta_1 BIRTH_TF + \beta_2 BIRTH_LF + \beta_3 CHBIRTH_LF + \beta_4 DEATH_TF + \beta_5 DEATH_LF + \beta_6 SLFEMP_LF + \beta_7 ESTBSIZE + \beta_8 SMEs_TF + \beta_9 AGE_14-64 + \beta_{10} UNI_GRDTS + \beta_{11} HGHSCH_GRDTS + \beta_{12} NET_MIGRATION + \beta_{13} POPDEN + \beta_{14} UNEMPL + \beta_{15} CHEMPL + \beta_{16} PATENTpc + \beta_{17} INNVpc + \beta_{18} CHINNVpc + \beta_{19} TECHPARK + \beta_{20} CRIME + \beta_{21} FRTRDZONE + \beta_{22} BNKDEPSTpc + \varepsilon$$

- Lastly, regional economic growth is measured as the growth in per capita GDP (GDPpcGrthRt) for the periods of 1987 to 1990, 1990 to 2000, and 2000 to 2011. The changes in GDP per capita is described as a function of entrepreneurial variables such as firm birth rates (BIRTH_TF and BIRTH_LF), changes in the numbers of firm births (CHBIRTH_LF), firm death rates (DEATH_TF and DEATH_LF), and self-employment rates (SLFEMP_LF). Similar to above two equations, GDPpcGrthRt equation include several socio-economic variables. Additionally, the equation includes the initial conditions of income per capita (InGDPpc). It is hypothesized that growth in GDP per capita over time is negatively related to the initial condition of per capita income (InGDPpc), meaning that those regions with higher levels of GDP per capita will have lower economic growth rate (GDPpcGrthRt) than those regions with lower levels of GDP per capita. This assumption is consistent with convergence theory. Also, the above hypotheses are valid for this equation.

$$\text{EQ 3: } GDPpcGrthRt = \beta_0 + \beta_1 BIRTH_TF + \beta_2 BIRTH_LF + \beta_3 CHBIRTH_LF + \beta_4 DEATH_TF + \beta_5 DEATH_LF + \beta_6 SLFEMP_LF + \beta_7 ESTBSIZE + \beta_8 SMEs_TF + \beta_9 AGE_14-64 + \beta_{10} UNI_GRDTS + \beta_{11} HGHSCH_GRDTS + \beta_{12} NET_MIGRATION + \beta_{13} POPDEN + \beta_{14} UNEMPL + \beta_{15} CHEMPL + \beta_{16} PATENTpc + \beta_{17} INNVpc + \beta_{18} CHINNVpc + \beta_{19} TECHPARK + \beta_{20} CRIME + \beta_{21} FRTRDZONE + \beta_{22} BNKDEPSTpc + \beta_{23} InGDPpc + \varepsilon$$

The second main aim of this thesis is to investigate the reasons behind the diverse effects of entrepreneurship on regional economic development. As indicated in the literature review, the contribution of entrepreneurship to economic development is controversial and may differ over time and among countries and regions of the same country (Reynolds et al., 1994; Carree et al., 2002; Acs and Armington, 2004; Wennekers et al., 2005; Stam, 2006; Gries and Naudé, 2008; Fritsch and Mueller, 2004, 2008; Acs and Mueller, 2008). In this respect, many scholars have attempted to determine the reasons of diverse effect of entrepreneurship on the regional economies. The vast majority of the empirical studies have determined two main causes underlying these differences. The entrepreneurship literature indicated that the essential factors that lead to the emergence of these variations are closely linked to the types and/or characteristics of entrepreneurship and economic development stage of regions. However, due to the lack of sufficient data regarding the type/characteristics of the entrepreneurship, the study did not analyze the impacts of diverse type of entrepreneurship on regional economic development. Therefore, the study used the economic development stages of regions for exploring the diverse impact of entrepreneurship on economic development. As indicated earlier, it is expected that the contribution of entrepreneurship differs across the stage of economic development and there is a U-shaped relationship between the rate of entrepreneurship and the level of economic development. In other words, regions with low economic development level mostly have weak institutions and governance, low level of innovation, and thereby have a huge number of low quality of entrepreneurship with a slight effect on economic growth, whereas regions with higher level of economic development have quality governance, good institution, high level of technological advancements and thus have a great number of innovative and high-quality entrepreneurship with significant positive effect on economic growth.

In this respect, following Porter (1990) and Porter et al. (2002) the study used the level of GDP per capita as a new classification of regions' economic development. In addition, many scholars such as Audretsch et al. (2002), Wennekers et al. (2005), Acs and Amoró's (2008), Acs, Desai and Hessels (2008), Bosma et al. (2009), Wennekers et al. (2010), Li and Zhao (2011), and Casero et. al. (2013) have used this classification to

find out the relationship between economic development stages of regions and entrepreneurship. Similar to these studies, to explore the relationship between the economic development level of the regions and entrepreneurship, the thesis categorized NUTS II regions into three different groups which are regions with high, medium and low level of economic development. The regions' GDP per capita levels were used for these categorizations. At first, the lower category was determined by subtracting standard deviation of GDP per capita from mean score. Secondly, the higher category was determined by adding standard deviation of variables into mean score. Lastly, the regions between lower and higher categories were described as medium ones. After this categorization, analysis of variance (ANOVA) was employed to explore the differences among group means. The analyses were conducted for three different periods 1990, 2000, and 2011 and for NUTS II regions of Turkey. Depending on the different proxies of entrepreneurship, the study created two equations:

- Firstly, the thesis examined the relationship between the rate of new firm formation (BIRTH_LF), measured as the number of new firm births per 1000 people in the labour force, and the economic development stages of regions (NUTS II regions). There are three categories; regions with low, medium and high level of economic development

EQ 4: *Rate of new firm formation (BIRTH_LF) → GDPpc Categories(Regions with LOW, MEDIUM, and HIGH levels of economic development)*

- Secondly, the study used self-employment rate (SLFEMP_LF), which is the other commonly used measure of entrepreneurship in the empirical study, as dependent variable against the economic development level of the regions.

EQ 5: *Self-employment rate (SLFEMP_LF) → GDPpc Categories(Regions with LOW, MEDIUM, and HIGH levels of economic development)*

It is hypothesized that the regions with low economic development level have higher levels of entrepreneurial activity (BIRTH_LF or SLFEMP_LF) than regions with medium economic development level. Also, it is expected that regions with high level of economic development have higher levels of entrepreneurial activity (BIRTH_LF or SLFEMP_LF) than those regions with medium economic development stage. In this respect, one can expect a U-shaped relationship between the rate of entrepreneurship and economic development levels of the regions.

The third and last objective of this thesis is to investigate the influences of the regional characteristics on entrepreneurship. In addition to the economic development level of the regions there are many determinants have a substantial influence on regional entrepreneurship. Following Verheul et al. (2002) and Kibler (2013) the study used certain regional characteristics as the explanatory variables in the entrepreneurship equations. Following the previous empirical studies discussed in Chapter V, multiple linear regression analysis is used for the estimation of the third research question. In addition, as entrepreneurship is a multi-dimensional concept and have different definitions and measures, the thesis used the following equations to estimate the impact of regional characteristics on regional entrepreneurial activity. The analyses were conducted for three different periods 1990, 2000, and 2011 and at NUTS II regions' level.

- Firstly, the rates of new firm entries (BIRTH_LF) are used as a measure of entrepreneurship. The new firm formation equation is defined as a function of socio-demographic variables such as the rate of labour force (AGE_14-64), human capital (UNI_GRDTS and HGHSCH_GRDTS), share of female in total population (FEMALE_TPOP), net migration rates (NET_MIGRATION), and age (AGE_20-40). As indicated earlier, the presence of a pooled labour market in an area may stimulate the formation of new firms in such area and thus a positive relationship is expected between AGE_14-64 and BIRTH_LF. Because education enhances entrepreneurial ability and productivity of individuals UNI_GRDTS is expected to positively affect the levels of new firm formation. Although the relationship between age and regional entrepreneurship is complicated, it is hypothesized that regions with higher population between the ages of 20 and 40 (AGE_20-40) have higher number of start-ups

(BIRTH_LF). Also, it is expected that regions with higher level of immigrants (NET_MIGRATION) can have higher level of start-up activity. On the contrary, as women have less financial capital, professional expertise, work experience, and difficulties in accessing loans, it is expected that higher rates of women (FEMALE_TPOP) is negatively related to the rate of firm entries (BIRTH_LF).

In addition, the new firm formation equation based on entrepreneurship literature contains other socio-economic variables. According to the literature based on agglomeration/urbanization economies, due to the availability of advanced businesses infrastructure and market proximity, the presence of university and other research centres, and pooled labour market, POPDEN and URBAN are expected to positively associated with firm birth rates (BIRTH_LF). As higher wealth and income levels are strongly associated with a greater demand for new and differentiated products and services, it is hypothesized that GDPpc have a positive relationship with new firm formation. The level of start-ups activities are considerably diverse between sectors, because as compared to manufacturing sector the cost of starting a new business is generally lower in agriculture and service sectors. Therefore, it is expected that share of employment in agriculture and service sectors (EMP_AGRC and EMP_SRVC) have positive effects on regional entrepreneurial activity, whereas share of employment in industrial sector (EMP_INDSTRY) has a negative impact on it. Also, it is expected that the share of employment in small firms/businesses (EMPL_SMEs) has a positive influence on the entrepreneur's decision to start a new business. In addition, because the availability of and easy access of financial capital is crucial for entrepreneurs, it is expected that BNKDEPSTpc is positively associated with high levels of new business formation. However, the relationship between entrepreneurship and unemployment is more complicated, and there are at least three different types of relations are defined in the literature. First, when unemployment rates rise, individual with low prospect for employment alternatives may be pushed into self-employment that results in positive relationship between unemployment and entrepreneurship. On the other hand, as the rates of unemployment increase which generally cause a depressed economy, the demand for services and goods will decline, thus the chance of individuals to start their own businesses will decline, this results in a negative relationship between self-

employment and unemployment. Finally, greater rates of entrepreneurship can lead to future increases in new jobs, thus reducing the rates of unemployment in the long-run. Therefore, the relationship between UNEMPL or/and CHUNEMPL and new business formation can be both positive and negative.

Furthermore, the equation includes some institutional variables like income tax rate (INCTAX) and corporate tax rate (CORPTAX) and some entrepreneurial cultural variables such as average firm size per region (ESTBSIZE) and share of small and medium enterprises in total firms (SMEs_TF).

The empirical literature determined a complex relation between taxation and new business formation. It is hypothesized that while the relationship between corporate tax value (CORPTAX) and new business formation (BIRTH_LF) is negative, this relation is positive for individual income tax value (INCTAX). In addition, it is expected that because the regions with higher rates of small firms have more favourable conditions for entrepreneurial activity, the share of small and medium enterprises in total firms (SMEs_TF) is positively related to new firm formation. On the contrary, regions with higher rates of large firms measured as the average firm size per region (ESTBSIZE) is expected to negatively associated with firm birth rates (BIRTH_LF).

EQ 6:

$$\begin{aligned}
 BIRTH_LF = & \beta_0 + \beta_1 AGE_14-64 + \beta_2 UNI_GRDTS + \beta_3 HGHSCH_GRDTS + \beta_4 \\
 & FEMALE_TPOP + \beta_5 NET_MIGRATION + \beta_6 AGE_20-40 + \beta_7 ESTBSIZE + \beta_8 SMEs_TF + \\
 & \beta_9 GDPpc + \beta_{10} GDPpcGrthRt + \beta_{11} URBAN + \beta_{12} POPDEN + \beta_{13} EMP_AGRC + \\
 & \beta_{14} EMP_SRVC + \beta_{15} EMP_INDSTRY + \beta_{16} EMPL_SMEs + \beta_{17} UNEMPL + \beta_{18} CHUNEMPL \\
 & + \beta_{19} TECHPARK + \beta_{20} CRIME + \beta_{21} INCTAX + \beta_{22} CORPTAX + \beta_{23} FRTRDZONE + \\
 & \beta_{24} BNKDEPSTpc + \varepsilon
 \end{aligned}$$

- Following Evans and Leighton (1989), Folster, (2000), Acs et al. (2005), and Henderson (2006) the rate of self-employment is used as the other measure of entrepreneurship. Similar to above equation, self-employment equation includes socio-demographic, socio-economic, institutional, and cultural variables. All assumptions and

hypotheses described above for the firm birth rate equation is also valid for self-employment equation.

$$\begin{aligned}
 \text{EQ 7: } SLFEMP_LF = & \beta_0 + \beta_1 AGE_14-64 + \beta_2 UNI_GRDTS + \beta_3 HGH SCH_GRDTS + \beta_4 \\
 & FEMALE_TPOP + \beta_5 NET_MIGRATION + \beta_6 AGE_20-40 + \beta_7 ESTBSIZE + \beta_8 SMEs_TF + \\
 & \beta_9 GDPpc + \beta_{10} GDPpcGrthRt + \beta_{11} URBAN + \beta_{12} POPDEN + \beta_{13} EMP_AGRC + \beta_{14} EMP_SRVC + \\
 & \beta_{15} EMP_INDSTRY + \beta_{16} EMPL_SMEs + \beta_{17} UNEMPL + \beta_{18} CHUNEMPL + \beta_{19} TECHPARK + \\
 & \beta_{20} CRIME + \beta_{21} INCTAX + \beta_{22} CORPTAX + \beta_{23} FRTRDZONE + \beta_{24} BNKDEPSTpc + \varepsilon
 \end{aligned}$$

6.3. Data Description

The data used in the analyses was derived from several sources such as Turkish Statistical Institute (TurkStat), The Union of Chambers and Commodity Exchanges of Turkey (TOBB), Turkish Patent Institute (TPI), and Banks Association of Turkey (BAT). The data was collected for three different periods 1990, 2000, and 2011. The focus of the study is 26 NUTS II regions of Turkey. Table 6.1 shows the source, abbreviation and definition of the variables.

6.3.1. Economic Development and Growth Variables

To assess the contribution of entrepreneurship on the level of regional economic development, the study used Gross Domestic Product per capita (GDPpc) for the years 1990, 2000, and 2011. The growth rate of GDP per capita (GDPpcGrthRt) and growth rate of GDP value (GDPvGrthRt) are calculated for the periods of 1987-1990, 1990-2000, and 2000-2011 similar to the other measures of economic growth. The data were obtained from TurkStat for both NUTS II and they available for the period 1987 to 2008. The data for the remaining years between 2008 and 2011 are extrapolated.

6.3.2. Entrepreneurship Variables

The first entrepreneurship variable used is self-employment. The number of self-employment in a region per 1000 labour force (SLFEMP_LF) is defined as the proxy of regional entrepreneurial activity. Using Labour Market approach²⁷ the total number of

²⁷ According to this approach, the entrepreneurial activities come from the labour force and thus the labour force should be used as the denominator, rather than total population (Acs and Armington, 2004; Baptista, Escaria, and Madruga, 2005).

self-employment is divided by the total number of labour force and then multiplied by a thousand. The self-employment data were obtained from Turkish Statistical Institute (TurkStat) which is available for the years 1985, 1990, 2000, and for the period of 2004-2011 at the NUTS II regional level. In addition to self-employment, the study used firm birth data as the other entrepreneurship variable. The absolute numbers of firm births were standardized using The Labour Market Approach and the Ecological Approach²⁸. The annual firm birth rates were calculated for NUTS II regions of Turkey for the year between 1987 and 2011 using above methods. Using labour market approach the total numbers of firm births (BIRTH_LF) and deaths (DEATH_LF) were divided by total number of labour force and then multiplied by 1000. On the other hand, depending on the ecological approach the total numbers of firm births (BIRTH_TF) and deaths (DEATH_TF) were divided by the total number existing firms. The study also used change in the number of firm births in a region per 1000 people in the labour force (CHBIRTH_LF) as the other variable of entrepreneurship. Data on firm births and deaths was derived from TurkStat and TOBB. In addition, average firm size (ESTBSIZE) and the share of small and medium enterprises in total firms (SMEs_TF) are the other entrepreneurship variables used in the study.

6.3.3. Demographic Variables

Besides entrepreneurship variables, the study used additional explanatory variables in growth equation to better understand the determinants of regional economic growth. In this respect, the study includes labour force participation rate which is measured by the share of population between the ages of 14-64 (AGE_14-64) and human capital variables which were calculated as the share of people with university and high-school education (UNI_GRDTS and HGHSCH_GRDTS). Rate of net migration (NET_MIGRATION), share of female in total population (FEMALE_TPOP), share of population between the ages of 20-40 (AGE_20-40) are the other demographic variables used in the analyses.

²⁸ Ecological Approach uses total number of established firms as the denominator while calculating firm birth rate and self-employment rate.

6.3.4. Socio-Economic Variables

The study also used eighteen socio-economic variables to investigate the relationship between entrepreneurship and regional economic development and growth. Urbanization rate (URBAN) is obtained by dividing urban population by total population of the region. Population density (POPDEN) used as the measure of agglomeration and it is obtained by dividing the total population by total square kilometre areas. Rate of unemployment (UNEMPL), change in the rate of unemployment (CHUNEMPL), share of employment is agricultural (EMP_AGRC), service (EMP_SRVC) and industrial (EMP_INDSTRY) sectors, rate of income and corporate taxes (INCTAX and CORPTAX), and the numbers of free trade zones (FRTRDZONE) and techno-parks (TECHPARK) are the other socio-economic variables included into the analyses. Furthermore, the study used three innovation variables which are patent per capita (PATENTpc), innovation per capita (INNVpc), and change in the rate of innovation per capita (CHINNVpc). Innovation per capita was obtained by dividing the total numbers of patent, utility model, trademark and industrial design applications by total population of regions and then multiplied per one hundred thousand. Lastly, the study used bank deposit per capita (BNKDEPSTpc) as a measure of financial capital.

Table 6.1: Definition and Data Sources of Variables

	Variables	Definitions	Source
Economic Growth	Variables	GDPpc	Gross Domestic Products (GDP) per capita
		GDPpcGrthRt	Growth rate of GDP per capita
		GDPvGrthRt	Growth rate of GDP value
		InGDPpc	Initial GDP per capita
Entrepreneurship	Variables	BIRTH_TF	Firm births per total firms
		BIRTH_LF	Firm births per 1000 labour force
		CHBIRTH_LF	Change in firm births per 1000 labour force
		DEATH_TF	Firm deaths per total firms
		DEATH_LF	Firm deaths per 1000 labour force
		SLFEMP_LF	Self-employment per 1000 labour force
		ESTBSIZE	Average establishment size
		SMEs_TF	Share of small and medium enterprises in total firms
Demographic	Variables	AGE_14-64	Share of population between 14-64 years
		UNI_GRDTS	Share of university graduates in total population
		HGHSCH_GRDTS	Share of high-school graduates in total population
		NET_MIGRATIO	Net migration rate
		FEMALE_TPOP	Share of female in total population
		AGE_20-40	Share of population between 20-40 years

Table 6.1: Continued

Socio-Economic Variables	URBAN	Urbanization rate	TurkStat
	POPDEN	Population density	TurkStat
	UNEMPL	Unemployment rate	TurkStat
	CHUNEMPL	Change in unemployment rate	TurkStat
	CHEMPL	Change in employment rate	TurkStat
	EMP_AGRC	Share of employment in agriculture sector	TurkStat
	EMP_SRVC	Share of employment in service sector	TurkStat
	EMP_INDSTRY	Share of employment in industrial sector	TurkStat
	EMPL_SMEs	Share of employment in small and medium enterprises	TurkStat
	PATENTpc	Patent per capita	TPI
	INNVpc	Innovation per capita	TPI
	CHINNVpc	Change in innovation per capita	TPI
	TECHPARK	Number of techno-parks	TurkStat
	CRIME	Crime rate	TurkStat
	FRTRDZONE	Number of free trade zones	TurkStat
	BNKDEPSTpc	Bank deposit per capita	BAT
	INCTAX	Per capita income tax	TurkStat
	CORPTAX	Per capita corporate tax	TurkStat

CHAPTER 7

EMPIRICAL ANALYSES AND RESULTS

In chapter six, individual empirical models were constructed for each research question. For the estimation of each model the study used Statistical Packages for Social Sciences (SPSS) software, version 20. The study conducted empirical analyses at NUTS II regions of Turkey, and for three different periods, namely 1990, 2000, and 2011. Therefore, this chapter consists of four major sections. In section 7.1 the results regarding three research questions for the period of 1990 is presented at NUTS II regional level. Similarly, section 7.2 and 7.3 present the results of the research questions for the periods of 2000 and 2011, respectively, at NUTS II regional level. Section 7.4 provides the summary of all these empirical findings for the three periods.

As indicated earlier, the study firstly aims to investigate the contribution of entrepreneurship on regional economic development and economic growth. To explore this relation, the study constructed three models and used GDP per capita as measure of economic development level, while growth in GDP value and growth in GDP per capita as measure of economic growth and dependent variable. The study used multiple regression analysis for the estimation of these three models at NUTS II regional level.

In addition, the study examined the reasons behind the diverse effects of entrepreneurship on regional economic development. In this respect, the study constructed two models for three different periods 1990, 2000, and 2011 and for NUTS II regions of Turkey. The study employed analysis of variance (ANOVA) to estimate these models.

Finally, the study aims to find out the impacts of certain regional characteristics on entrepreneurship. The thesis used firm birth rates and self-employment rates as a

measure of entrepreneurship into two models. To estimate these models the study employed multiple regression analysis.

Prior to analyses, the missing data, outliers, heterogeneity, heteroscedasticity, autocorrelation, and multicollinearity were checked on the variables for each periods. Multicollinearity problem was found from the results of Pearson correlation tests. To overcome this problem and increase the efficiency of estimation, independent variables which highly correlated (with 0.8 or higher correlation coefficient) with other independent variables were removed from the analysis. In addition, the study conducted tests of normality for all the data variables and the findings showed that some variables did not follow normal distribution and their skewness and kurtosis outside the range of -1 to +1. Therefore, the thesis used the natural logarithm to reduce skewness and kurtosis of the variables (Tabachnick and Fidell, 1996).

7.1. The Empirical Findings at NUTS II regions for the periods of 1990, 2000, and 2011

7.1.1. Main Findings for the period of 1990

Table 7.1 indicates the descriptive statistics of economic growth, entrepreneurship, demographic and socio-economic variables used in the analyses. Columns 2 and 3 show the minimum and maximum value of variables, and column 5 indicate the standard deviation, while column 3 shows average values of the variables.

The results of Pearson correlation analysis are demonstrated in Table 7.2, providing evidence about the links between variables. The results indicate that Gross Domestic Product per capita (GDPpc) has positive and significant correlation with firm birth per labour force (BIRTH_LF), firm death rate (DEATH_LF), urbanization rate (URBAN), human capital (UNI_GRDTS and HGHSCH_GRDTS), labour force (AGE_14-64), net migration (NET_MIGRATION), population density (POPDEN), and financial capital (BNKDEPSTpc). The result is fully consistent with recent growth theories and hypothesis of the thesis. On the other hand, GDP per capita has negatively correlated with self-employment rate. This means that because most of the self-employment is not

innovative and knowledge-based, regions with higher self-employment have lower GDP per capita.

Table 7.1: Descriptive Statistics for NUTS II Regions, 1990

	Variables	N	Minimum	Maximum	Mean	Std. Deviation
1	BIRTH_TF	26	0,007	0,041	0,016	0,010
2	BIRTH_LF	26	0,096	1,180	0,350	0,270
3	CHBIRTH	26	-0,201	1,606	0,078	0,386
4	DEATH_TF	26	0,000	0,001	0,000	0,000
5	DEATH_LF	26	0,000	0,047	0,011	0,012
6	SLFEMP_LF	26	81,060	188,656	142,670	27,090
7	ESTBSIZE	26	13,386	64,487	32,012	12,489
8	GDPvGrthRt	26	-0,049	0,147	0,038	0,035
9	GDPpc	26	370708	2443077	1302539	600443
10	GDPpcGrthRt	26	-0,144	0,060	0,011	0,037
11	InGDPpc	26	336292	2405264	1255640	574006
12	AGE_14_64	26	0,485	0,675	0,597	0,054
13	URBAN	26	0,335	0,924	0,530	0,153
14	UNI_GRDTS	26	0,009	0,065	0,023	0,013
15	HGHSCH_GRDTS	26	0,017	0,129	0,059	0,025
16	FEMALE_TPOP	26	0,467	0,517	0,495	0,011
17	NET_MIGRATION	26	-200636	656677	0	159376
18	POPDEN	26	30,844	1406,696	125,268	264,621
19	AGE_20_40	26	0,247	0,368	0,300	0,037
20	EMP_AGRC	26	0,050	0,770	0,590	0,176
21	EMP_SRVC	26	0,160	0,600	0,252	0,105
22	EMP_INDSTRY	26	0,050	0,420	0,152	0,081
23	CHEMPL	26	-0,006	0,067	0,025	0,019
24	UNEMPL	26	0,028	0,107	0,057	0,022
25	CHUNEMPL	26	-0,030	0,157	0,060	0,039
26	FRTRDZONE	26	0,000	2,000	0,231	0,514
27	BNKDEPSTpc	26	0,153	6,641	1,212	1,422
	Valid N (listwise)	26				

Table 7.2: Correlation Matrix among Variables of NUTS II Regions, 1990

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1 BIRTH_IF	1																										
2 BIRTH_LF	,880**	1																									
3 CHBIRTH	,555**	,266	1																								
4 DEATH_IF	-,114	,075	-,288	1																							
5 DEATH_LF	-,238	,080	-,319	,739**	1																						
6 SLFEMP_LF	-,422*	-,554**	-,043	-,264	-,114	1																					
7 ESTBSIZE	-,110	-,548**	,431*	-,323	-,468*	,522**	1																				
8 GDPGrthRt	-,202	-,143	-,120	,069	,240	,206	-,047	1																			
9 GDPpc	,104	,465*	-,553**	,535**	,516**	-,425*	-,771**	,186	1																		
10 GDPpcGrthRt	,244	,233	,039	-,144	-,228	-,286	-,134	-,551**	-,099	1																	
11 lnGDPpc	,171	,529**	-,519**	,521**	,486*	-,484*	-,794**	,089	,985**	,070	1																
12 URBAN	,458*	,721**	-,171	,315	,288	-,701**	-,787**	,091	,703**	,101	,728**	1															
13 UNL_GRDTS	,235	,482*	-,541**	,351	,266	-,407*	-,618**	,038	,832**	-,035	,819**	,686**	1														
14 HGHSCH_GRDTS	,071	,281	-,575**	,419*	,319	-,399*	-,486*	,058	,773**	-,223	,723**	,595*	,933**	1													
15 AGE_14_64	-,109	,169	-,698**	,328	,332	-,119	-,527**	,120	,815**	-,172	,772**	,434*	,891**	,865**	1												
16 FEMALE_TPOP	-,484*	-,555**	-,194	-,263	-,164	,158	,257	-,107	-,402*	,204	-,385	-,425*	-,289	-,249	-,193	1											
17 NET_MIGRATION	,384	,649**	-,226	,420*	,518**	-,501**	-,625**	,093	,740**	,116	,775**	,711**	,636**	,542*	,499*	-,457*	1										
18 POPDEN	,165	,509**	-,255	,563*	,613**	-,564**	-,752*	,078	,730**	-,012	,766**	,655*	,563**	,482*	,454*	-,223	,760**	1									
19 AGE_20_40	,126	,417*	-,554**	,428*	,360	-,341	-,646**	,132	,890**	-,137	,863**	,642*	,915**	,866**	,907**	-,501**	,659**	,589**	1								
20 EMP_AGRC	,303	,625**	-,397*	,420*	,373	-,676**	-,802**	,056	,887**	,060	,902**	,891**	,867**	,795**	,707**	-,449*	,811**	,756**	,871**	1							
21 EMP_SRVC	,476*	,724**	-,221	,365	,254	-,611**	-,714**	,029	,785**	,052	,800**	,895*	,830**	,742**	,600**	-,597**	,721**	,607**	,810**	,932**	1						
22 EMP_INDUSTRY	-,002	,392*	-,587**	,425*	,494*	-,572**	-,844**	,134	,888**	,044	,893**	,759*	,781**	,727*	,749*	-,221	,758**	,777**	,818**	,917**	,731**	1					
23 CHEMPL	,041	,291	-,152	,199	,425*	-,313	-,539**	,405*	,433*	,302	,491*	,386	,183	,025	,174	-,192	,593**	,513**	,303	,441*	,307	,554**	1				
24 UNEMPL	,346	,377	,312	,139	,052	-,568**	-,317	-,019	-,044	,174	-,006	,482*	-,110	-,114	-,432*	-,117	,117	,266	-,178	,184	,279	,048	,164	1			
25 CHUNEMPL	,012	-,115	,275	-,132	-,082	,298	,178	,399*	-,320	,204	-,295	-,099	-,392*	-,453*	-,452*	,057	-,210	-,319	-,442*	-,345	-,216	-,351	,251	,298	1		
26 FRTRDZONE	,227	,330	-,130	,591**	,562**	-,235	-,271	,016	,389*	,082	,411*	,427*	,480*	,451*	,329	-,159	,545**	,530**	,392*	,450*	,411*	,401*	,286	,200	,011	1	
27 BNKDEFTpc	,138	,390*	-,547**	,292	,218	-,481*	-,612**	,046	,786**	-,015	,777**	,631**	,937**	,896**	,846**	-,146	,609**	,585**	,855**	,841**	,757**	,804**	,199	-,092	-,441*	,354	1

**, Correlation is significant at the 0.05 level (2-tailed).

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

The findings also show that as expected firm birth rate has significantly and positively associated with urbanization rate (URBAN), university graduate rate (UNI_GRDTS), net migration rate (NET_MIGRATION), population density (POPDEN), share of population between age of 20-40 years (AGE_20-40), share of service sector (EMP_SRVC), and financial capital (BNKDEPSTpc). These results are consistent with entrepreneurship literature and thesis hypothesis. Conversely, self-employment rate has significant and negative correlation with demand (GDPpc), urbanization rate (URBAN), human capital (UNI_GRDTS and HGHSCH_GRDTS), net migration (NET_MIGRATION), population density (POPDEN), share of service sector (EMP_SRVC), and financial capital (BNKDEPSTpc). These results are not consistent with entrepreneurship literature and hypothesis of thesis.

7.1.1.1. The contribution of entrepreneurship on regional economic development and economic growth, NUTS II Regions, 1990

This sub-section presents the empirical results regarding the first research question which investigates the impact of entrepreneurship on regional economic development and growth. In this regard, the study conducted three different analyses at NUTS II regional level for the year 1990. At first as a measure of economic development the study used Gross Domestic Product per capita (GDPpc) (1990) and to measure economic growth, growth in value of GDP (1987-1990) and growth in per capita GDP (1987-1990) were used respectively.

The level of economic development (GDP per capita) and entrepreneurship variables

Within this framework, using multiple regression analysis, the results of GDP per capita equations for NUTS II of Turkey are demonstrated in Table 7.3. GDP per capita equation is regressed against entrepreneurship variables firm birth rate per total firms (BIRTH_TF), firm birth rate per 1000 people in labour force (BIRTH_LF), change in firm birth rate per 1000 people in labour force (CHBIRTH), firm death rate (DEATH_LF), self-employment rate (SLFEMP_LF), and establishment size per regions (ESTSIZE); and other socio-economic variables human capital (UNI_GRDTS and HGHSCH_GRDTS), labour force (AGE_14-64), net migration (NET_MIGRATION), population density (POPDEN), change in unemployment rate (CHUNEMPL), and

financial capital represented as bank deposit per capita (BNKDEPSTpc). The goodness of fit (R^2) of the empirical results varies from 78 to 95 percent in GDP per capita. Table 7.3 presents the results of seven regression models.

In the first model, GDP per capita (GDPpc) level is regressed only against entrepreneurship variables. The results show that the level GDP per capita has positive and significant relationship with firm birth rate per labour force (BIRTH_LF), as expected. On the other hand, it is negatively and significantly associated with growth in firm birth rate (CHBIRTH). In addition, as seen, firm death rate (DEATH_LF) has positively and significantly related to GDP per capita level. All these imply that regions with higher firm birth rate and firm death rate are predicted to have higher economic development level (GDP per capita). This is consistent with the argument of Schumpeter putting forward that creative destruction processes results in new invention and idea that make existing technologies and products obsolete therefore regions with higher turbulence (birth and death of firms) have higher economic development level. However, growth in firm birth rate between periods of 1987-1990 does not have positive effect on GDPpc level. Further, firm birth rate per total firms (BIRTH_TF) is not statistically significant. Model 1 was significant ($p < 0.001$) and entrepreneurship variables explained a significant proportion of variation of GDPpc level $R^2 = 0.82$, $F(5.20) = 17.74$.

Model 2 added self-employment rates (SLFEMP_LF) and excluded firm birth rate per total firms (BIRTH_TF) to model 1. Similar to the first model, firm birth rate per labour force (BIRTH_LF) and firm death rate (DEATH_LF) have positive and significant relation with economic development level (GDPpc), whereas growth in firm birth rate (CHBIRTH) has significant and negative relation. As the other measure of entrepreneurship, self-employment rate does not have significant influence on GDP per capita level and it has negative coefficient. This means that regions with higher self-employment rate have lower estimated the level of GDP per capita. Because the majority of self-employment in Turkey are necessity-driven, non-innovative, and based on informal and agricultural sector, they have limited contribution to economy.

Model 3 contains entrepreneurship variables and labour force (AGE_14-64) variable. The results show that labour force (AGE_14-64) and GDP per capita level are positively and significantly associated. This result is consistent with neo-classical perspective, meaning that the presence of labour force in a region positively affects economic development level of respective region. In terms of entrepreneurial activity, firm birth rate per labour force (BIRTH_LF) and firm death rate (DEATH_LF) are positively and significantly related with the level of GDP per capita. Growth in firm birth rate (CHBIRTH) and self-employment rate (SLFEMP_LF) are found to be statistically insignificant with unexpected signs. This implies that the growth in the level new firm formation over the period of 1987-1990 does not have significant contribution on regional economic development level (GDP per capita). This may explain by the quality of firms, which are non-innovative, entered the market during this period. Model 3 was also significant ($p < 0.001$) and entrepreneurship variables and physical capital explained an essential part of variation of GDPpc $R^2 = 0.88$, $F(5, 20) = 28.83$.

Model 4 added human capital variables as measured university graduate rate and high school graduate rate (UNI_GRDTS and HGHSCH_GRDTS), to model 2. The results indicate that although they are highly emphasized in recent growth theories, both university graduate rate (UNI_GRDTS) and high school graduate rate (HGHSCH_GRDTS) are not statistically significant in this model, but both of have expected sign. Among entrepreneurship variables as indicated in previous model, firm birth rate per labour force (BIRTH_LF) has a positive and significant effect on the level of GDP per capita, but growth in firm birth rate (CHBIRTH) has negative and significant relation. Furthermore, firm death rate and self-employment rate are not statistically significant. As observed, because the numbers of significant variables declined, R^2 decreased to 83 ($p < 0.001$).

In model 5, the study added financial capital as measured bank deposit per capita (BNKDEPSTpc) to model 2. GDP per capita level is positively and significantly associated with bank deposit per capita, as expected. This means that regions with higher levels of saving and capital have higher economic development level. The impacts of entrepreneurship variables on GDPpc are constant and similar to Model 1. Model 5 was significant ($p < 0.001$) and $R^2 = 0.82$, $F(5, 20) = 18.79$.

Table 7.3: Regression Results Using GDP per Capita as Dependent Variable, (NUTS II, 1990)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Constant	(0.27)	(5.00)***	(0.77)	(3.97)***	(5.19)***	(1.42)	(3.33)***
BIRTH_TF	-0.55 (1.45)	-	-	-	-	-	-1.10 (1.65)
BIRTH_LF	1.05*** (3.22)	0.54*** (4.17)	0.32*** (2.86)	0.28** (1.28)	0.39** (2.82)	0.48** (2.37)	2.04** (2.49)
CHBIRTH	-0.46*** (3.10)	-0.62*** (5.41)	-0.21 (1.58)	-0.31** (1.78)	-0.36** (2.38)	-0.27* (1.81)	-0.45** (2.46)
DEATH_LF	0.32** (2.11)	0.26** (2.38)	0.23** (2.77)	0.27 (2.55)	0.29*** (2.84)	0.20* (2.06)	0.10 (0.68)
SLFEMP_LF	-	-0.12 (0.99)	-0.17 (1.76)	-0.08 (0.64)	-0.02 (0.15)	-0.23 (1.69)	-0.38** (2.45)
ESTBSIZE	-	-	-	-	-	-	0.77* (1.95)
AGE_14_64	-	-	0.52*** (4.02)	-	-	0.83*** (3.00)	1.29*** (4.19)
UNI_GRDTS	-	-	-	0.42 (0.94)	-	-0.49 (0.91)	-1.33** (2.45)
HGHSCH_GRDTS	-	-	-	0.00 (0.01)	-	0.09 (0.28)	0.58* (1.97)
NET_MIGRATION	-	-	-	-	-	-	-0.22 (1.30)
POPDEN	-	-	-	-	-	-	0.44*** (2.79)
CHUNEMPL	-	-	-	-	-	-	0.39*** (3.21)
BNKDEPSTpc	-	-	-	-	0.37** (2.26)	-0.03 (0.09)	-0.10 (0.40)
R Square	0.82	0.78	0.88	0.83	0.82	0.89	0.95
F-Value	17.74***	18.58***	28.83***	15.44***	18.79***	17.10***	17.23***
N. of Obs.	26	26	26	26	26	26	26

Notes: * p < .10, ** p < .05, *** p < .01; absolute value of the t-statistics is in parentheses

Model 6 regressed economic development variable (GDPpc) against all these variables. In terms of entrepreneurship variables firm birth rate per labour force (BIRTH_LF) and firm death rate (DEATH_LF) are positively and significantly related with the level of GDP per capita, whereas growth in firm birth rate (CHBIRTH) is negatively and significantly related to GDPpc. On the other hand, self-employment rate (SLFEMP_LF)

does not have significant effect on economic development. Among socio-economic variables only labour force (AGE_14-64) have a positive and significant relation with GDP per capita level, as expected. However, the remaining variables are not statistically significant and also, university graduate rate (UNI_GRDTS) and bank deposit per capita (BNKDEPSTpc) have unexpectedly negative coefficient. Model 6 was significant ($p < 0.001$) and $R^2 = 0.89$, $F(8, 17) = 17.10$.

In the last model, Model 7, in addition to these variables the study added the other socio-economic variables to model 6. The results show that in terms of entrepreneurship variables only firm birth rate per labour force (BIRTH_LF) has positive and significant influence on the level of GDP per capita. Contrary to expectation, growth in firm birth rate (CHBIRTH) and self-employment rate (SLFEMP_LF) have significant and negative relationships with economic development level (GDPpc). These results imply that regions with higher firm birth rate have higher GDP per capita levels than region with higher growth in firm birth rate (during the period 1987-1990) and self-employment rate in 1987. Establishment size (ESTBSIZE) is significantly and positively related to economic development (GDPpc). This means that those regions with higher numbers of large firms have higher estimated GDP per capita level. As expected, labour force (AGE_14-64) is positively and significantly associated with GDP per capita. However, contrary to expectation, university graduate rate (UNI_GRDTS) is negatively and significantly associated to economic development level, but high-school graduate rate is positively and significantly related to GDP per capita level, as expected. This means that regions with higher university graduate rates are expected to have lower economic development levels than regions with higher high-school graduate rates. The possible reason behind the negative effect of university graduates on regional economic development is that as the higher numbers of university graduates were unemployed or worked in jobs having less positive contributions on economic development, regions with higher university graduate rates have lower GDP per capita. In addition, the relationship between agglomerations as represented population density (POPDEN) and economic development is positive and significant. This result is consistent with new industrial district and cluster theory, indicating that those regions with higher levels of agglomeration are predicted to have higher GDP per capita level. Contrary to

expectation, change in unemployment rate (CHUNEMPL) is positively and significantly related to the level of GDP per capita. As regions with high economic development levels are confronted with mass migration which lead to an increasing unemployment, unemployment growth rate in such regions may positively associated with economic development. The remaining variables do not have statistically significant effect on regional economic development. Further, financial capital (BNKDEPSTpc) and net migration (NET_MIGRATION) have unexpected signs. Model 7 was significant ($p < 0.001$) and all variables explained a significant proportion of variation of GDPpc $R^2 = 0.95$, $F(13, 12) = 17.23$.

The level of economic growth (measured by growth in GDP value) and entrepreneurship variables

Table 7.4 shows the results of GDP value growth rate (GDPvGrthRt) equation for NUTS II regions for the year 1990. The GDP value growth rate (GDPvGrthRt) is estimated as functions of entrepreneurship variables such as, firm birth rate per 1000 people in labour force (BIRTH_LF), change in firm birth rate per 1000 people in labour force (CHBIRTH), firm death rate (DEATH_LF), self-employment rate (SLFEMP_LF), and a set of socio-economic variables human capital (UNI_GRDTS and HGHSCH_GRDTS), total labour force (AGE_14-64), net migration (NET_MIGRATION), agglomeration as measured population density (POPDEN), change in unemployment rate (CHUNEMPL), change in employment rate (CHEMPL), and financial capital represented as bank deposit per capita (BNKDEPSTpc). The goodness of fit (R^2) of the empirical results varies from 54 to 85 percent in GDP value growth rate.

The first model, Model 1, contains entrepreneurship variables and change in unemployment rate (CHUNEMPL). The results show that among entrepreneurship variables firm death rate (DEATH_LF) and self-employment rate (SLFEMP_LF) have positive and significant relation with GDP value growth rate (GDPvGrthRt). On the other hand, firm birth rate (BIRTH_LF) and growth in firm birth rate (CHBIRTH) do not have significant influence on economic development (GDPvGrthRt), but both have expected sign. The possible reason behind this result can be that on the one hand the majority of the firm enter market are non-innovative and do not create a substantial

impact on regions' economy in terms of job creation, innovation, and productivity; on the other hand, the other drivers of economic growth may be more effective than firm formation rate in explaining the level of economic growth. Contrary to expectation, change in unemployment rate (CHUNEMPL) is positively and significantly associated with GDP value growth rate. As mentioned earlier, mass migration towards developed regions may trigger the emergence of this result. The model was significant ($p < 0.05$) and variables explained an important proportion of variation of GDP value growth rate (GDPvGrthRt) $R^2 = 0.54$, $F(5, 18) = 4.30$.

Model 2 added change in employment rate (CHEMPL) and excluded change in unemployment rate (CHUNEMPL) to Model 1. The independent variables explain 73% of variation in GDP value growth rate and $F(5, 18) = 9.54$, $p < .001$. The findings show that in addition to firm death rate and self-employment rate, growth in firm birth rate (CHBIRTH) also has positively and significantly associated with GDP value growth rate (GDPvGrthRt). However, contrary to expectation firm birth rate (BIRTH_LF) is not significant with negative coefficient. This means that those regions with higher firm birth rate have lower GDP value growth rate. As expected, a statistically highly significant positive coefficient is found for growth in employment rate (CHEMPL), indicating that regions with higher employment levels are predicted to have higher GDP value growth rate (GDPvGrthRt). Increasing rate of employment leads to an increase in the level of prosperity.

The last model, Model 3, estimated GDP value growth rate as a function of entrepreneurship variables and a set of socio-economic variables. The results indicate that in terms of entrepreneurship variables only change in firm birth rate (CHBIRTH) is positively and significantly associated with GDPvGrthRt, ($\beta = .38$, $p < .10$), indicating that regions with higher levels of firm birth growth rate have higher GDP value growth rate. Although the remaining entrepreneurship variables are not statistically significant all have expected signs. As expected, human capital as measured university graduate rate (UNI_GRDTS) has positive and significant impact on economic growth ($\beta = 2.70$, $p < .10$). However, high-school graduate rate is not statistically significant in determining economic growth. This result is consistent with human capital theory and implies that regions with high rate of university graduate have higher economic growth rate. In

addition, net migration rate (NET_MIGRATION) is positively and significantly related to GDP value growth rate, referring that those region with higher net migration rate are predicted to have higher economic growth rate. Similar to Model 2, change in employment rate (CHEMPL) has substantially positive and significant relation with GDP value growth rate ($\beta = 23.58$, $p < .001$). Although the remaining variables are not statistically significant, all have expected signs. While financial capital and population density have positive coefficient, change in unemployment rate has negative coefficient. All these results are consistent with recent growth theories and thesis hypothesis.

Table 7.4: Regression Results Using GDP Value Growth Rate as Dependent Variable (NUTS II, 1990)

Variables	Model 1	Model 2	Model 3
Constant	-0.75 (1.61)	-1.31*** (3.34)	-4.99 (1.39)
BIRTH_LF	0.41 (1.36)	-0.11 (0.49)	0.48 (1.05)
CHBIRTH	0.22 (1.22)	0.45*** (3.30)	0.38* (1.82)
DEATH_LF	0.44*** (3.16)	0.22* (1.90)	0.05 (0.30)
SLFEMP_LF	0.01* (2.00)	0.01** (2.36)	0.01 (1.72)
AGE_14_64	-	-	1.77 (0.45)
UNI_GRDTS	-	-	2.70* (1.87)
HGHSCH_GRDTS	-	-	2.17 (1.28)
NET_MIGRATION	-	-	0.00** (2.29)
POPDEN	-	-	0.21 (1.40)
CHEMPL	-	13.23*** (4.76)	23.58*** (2.91)
CHUNEMPL	4.32** (2.53)	-	-2.30 (0.81)
BNKDEPSTpc	-	-	0.23 (0.63)
R Square	0.54	0.73	0.85
F-Value	4.30***	9.54***	5.13***
N. of Obs.	26	26	26

Notes: * $p < .10$, ** $p < .05$, *** $p < .01$; absolute value of the t-statistics is in parentheses

The level of economic growth (measured by growth in GDP per capita) and entrepreneurship variables

Table 7.5 demonstrates the findings of GDP per capita growth equations for NUTS II regions for the period of 1990. GDP per capita growth rate (GDPpcGrthRt) is estimated against entrepreneurship variables – firm birth rate per 1000 people in labour force (BIRTH_LF), firm death rate (DEATH_LF), and self-employment rate (SLFEMP_LF), and a set of additional socio-economic variables. The results of three models are revealed in the table. The goodness of fit (R^2) of the empirical results varies from 58 to 69 percent in GDP per capita growth rate.

In the first model, Model 1, GDP per capita growth (GDPpcGrthRt) is estimated as a function of entrepreneurship variables and human capital variables. The model was significant and explains 58% of variation in GDP per capita growth rate and $F(5, 20) = 5.20$, $p < .01$. As shown in the table self-employment rate (SLFEMP_LF) is positively and significantly associated with GDP per capita growth rate as expected. However, although firm birth rate per labour force (BIRTH_LF) and firm death rate (DEATH_LF) are not statistically significant, both have expected signs according to Schumpeter perspective. These results indicate that regions with higher entrepreneurial activity are predicted to have higher GDP per capita growth. In terms of human capital variables, university graduate rate (UNI_GRDTS) is negatively and significantly related with economic growth, whereas high-school graduate rate (HGHSCH_GRDTS) has positive and significant influence on economic growth (GDPpcGrthRt). This means that regions with higher high-school graduate rate, which represents a pooled skilled labour force, and lower university graduate rate have higher estimated GDP per capita growth rate.

Model 2 added labour force (AGE_14-64) and financial capital (BNKDEPSTpc) to Model 1. The R^2 did not increase because the coefficient labour force and financial capital are not statistically significant. Similar to model 1, self-employment rate (SLFEMP_LF) and high-school graduate rate (HGHSCH_GRDTS) are positive and significant, but university graduate rate (UNI_GRDTS) is negative and significant. While labour force (AGE_14-64) has unexpected signs which is not consistent with

neoclassical growth theory, financial capital represented by bank deposit per capita (BNKDEPSTpc) has expected signs. This means that regions with lower pooled labour force rate and higher bank deposit per capita have higher estimated GDP per capita growth. The model was significant ($p < 0.01$) and variables explained an important proportion of variation of GDP per capita growth rate (GDPpcGrthRt) $R^2 = 0.59$, $F(6, 19) = 4.46$.

Table 7.5: Regression Results Using GDP per Capita Growth Rate as Dependent Variable (NUTS II, 1990)

Variables	Model 1	Model 2	Model 3
Constant	-0.02 (0.32)	0.00 (0.00)	0.31 (0.72)
BIRTH_LF	0.02 (0.73)	0.03 (0.67)	0.05 (1.10)
DEATH_LF	0.01 (0.39)	-	-
SLFEMP_LF	0.00** (2.38)	0.00** (2.26)	0.00*** (2.95)
CHUNEMPL	-	-	-0.21 (0.88)
CHEMPL	-	-	0.99 (1.46)
UNI_GRDTS	-0.28*** (2.97)	-0.31** (1.96)	-0.33* (1.95)
HGHSCH_GRDTS	0.41*** (2.87)	0.42*** (3.97)	0.58*** (4.12)
AGE_14_64	-	-0.11 (0.34)	-0.57 (1.25)
NET_MIGRATION	-	-	0.00 (1.54)
POPDEN	-	-	0.02* (1.46)
BNKDEPSTpc	-	0.03 (0.56)	0.03 (0.67)
R Square	0.58	0.59	0.69
F-Value	5.52***	4.46***	3.30***
N. of Obs.	26	26	26

Notes: * $p < .10$, ** $p < .05$, *** $p < .01$; absolute value of the t-statistics is in parentheses

The last model, Model 3, added several other socio-economic variables to model 2. As observed in the table, the impact of entrepreneurship and human capital variables same as the model 1 and model 2. Among the other socio-economic variables, only

agglomeration as measured population density (POPDEN) has positive and significant association with the level of economic growth ($\beta = .02$, $p < .10$). The result is consistent with cluster and new industrial district theories indicating that pool of knowledge, skilled labour, proximity of input and output markets, low transaction costs, locally embedded relations, and high innovative activities result in economic growth. The remaining variables are not statistically significant. While change in employment rate (CHEMPL), change in unemployment rate (CHUNEMPL), net migration (NET_MIGRATION), and financial capital represented as bank deposit per capita (BNKDEPSTpc) have expected signs, total labour force (AGE_14-64) does not have expected sign. The model was significant and explains 69% of variation in GDP per capita growth rate and $F(10, 15) = 3.30$, $p < .01$.

7.1.1.2. The relationship between entrepreneurship and economic development stages of NUTS II Regions, 1990

The main aim of this sub-section is to provide empirical results about the second research question at NUTS II regional level for the year 1990. The question examines the relationship between economic development levels of regions and entrepreneurial activity levels of regions. As mentioned above, regions at different stage of economic development have different type and level of entrepreneurial activity. In other words, regions at the early stage of economic development (or factor-driven stage) have high rate of self-employment that is mainly necessity-driven, non-innovative, and informal; regions at the middle stage of economic development (or efficiency-driven stage) have higher numbers of large firms, and thus lower firm birth rate; and lastly, regions at the advanced stage of economic development (or innovation-driven stage) have higher numbers of small and innovative firms, and therefore have higher firm formation rate. For these reasons, a U-shaped relationship between entrepreneurial activity and regional economic development level is expected. In this regard, it is hypothesized that there is a significant difference between means of each group. It is expected that regions with low and high economic development level have higher firm birth rate per labour force (BIRTH_LF) and self-employment rate (SLFEMP_LF) than regions at the middle stage of economic development. Within this framework, the thesis used ANOVA to investigate this relationship.

Firstly, the thesis used the rate of new firm formation, measured as the number of new firm births per 1000 people in the labour force (BIRTH_LF), as a measure of entrepreneurship to explore the relationship between the economic development stages of regions (NUTS II regions) and level of regional entrepreneurial activity. In addition, to determine economic development level of regions the study used GDP per capita and described three categories; regions with low, medium and high level of economic development.

In this framework, Table 7.6 shows the ANOVA results. According to the results, the regions with high economic development level ($M = 0.691$, $SD = 0.41$) have higher level of new business formation (BIRTH_LF) than region with medium ($M = 0.250$, $SD = 0.10$) and low ($M = 0.348$, $SD = 0.28$) economic development level. The result is not fully consistent with entrepreneurship literature because it is also expected that regions at the early stage of economic development should have higher new firm formation rate than regions at the advanced stage of economic development. As mentioned above due to having large numbers of small firms and technological development region with high economic development level have higher firm birth rate. Furthermore, the results indicate that regions at the low economic development level have higher firm birth rate than those regions at the medium economic development level. This implies that lack of formal businesses opportunities and institutional and/or infrastructural structures forced many people to start their own businesses in regions at the low economic development level and therefore they have higher rate of new firm formation. All these results support the thesis hypothesis, indicating that there is a U-shaped relationship between the level of entrepreneurial activity and economic development level. The ANOVA findings also demonstrate that the difference between mean scores are statistically significant ($F_{2, 23} = 8.16$; $P < .01$).

Table 7.6: ANOVA Results of BIRTH_LF at NUTS II Regions, 1990

	Groups	N	Mean	SD	F	<i>p</i>
GDPpc	High	5	0.691	0.406	8.159	0.002
	Low	4	0.348	0.279		
	Medium	17	0.250	0.103		
	Total	26	0.350	0.270		

Secondly, the thesis used self-employment rate per 1000 people in labour force (SLFEMP_LF) as a measure of entrepreneurship in ANOVA analysis. As demonstrated in table 7.7, regions at medium economic development level (M =151.75, SD =22.08) have higher self-employment rate than regions at high (M =105.80, SD =18.75) and low economic development level. The result is not consistent with entrepreneurship literature because many people would try to move from self-employment to wage employment it was expected that self-employment rate in regions at the middle stage of economic development should be lower than region at the early and advanced stage of economic development. The reason behind this result is that regions at the medium economic development are probably have more economic activity in agricultural sector, where holds many self-employment, than the regions at the high economic development level. These results imply that contrary to expectation there is an inverse U-shaped relationship between economic development level and self-employment rate. In addition, although the results do not support the thesis hypothesis, ANOVA results show that there was a significant difference between the means of these three groups ($F_{2, 23} = 9.76$; $P < .01$).

Table 7.7: ANOVA Results of SLFEMP_LF at NUTS II Regions, 1990

	Groups	N	Mean	SD	F	p
GDPpc	High	5	105.799	18.755	9.763	0.001
	Low	4	150.149	15.399		
	Medium	17	151.754	22.085		
	Total	26	142.670	27.090		

7.1.1.3. The effects of certain regional characteristics on entrepreneurship at NUTS II Regions, 1990

This sub-section provides empirical results about the third research question which aims to examine the effects of certain regional characteristics on regional entrepreneurship. The study used two measures of entrepreneurship firm birth per 1000 people in the labour force (BIRTH_LF) and self-employment per 1000 people in labour force

(SLFEMP_LF) as dependent variables and a set of demographic, economic, institutional and cultural variables as explanatory variables. The study constructed four models and demonstrates results of these models in Table 7.8. The first two models are based on firm birth rate, while the next ones are based on self-employment rate.

In this context, Model 1 estimated firm birth rate (BIRTH_LF) as a function of demographic variables such as labour force rate (AGE_14_64), human capital measured as university graduate rate and high-school graduate rate (UNI_GRDTS and HGHSCH_GRDTS), share of female in total population (FEMALE_TPOP), net migration rate (NET_MIGRATION), and share of people between 20-40 years (AGE_20_40). The goodness of fit (R^2) of the three empirical results varies from 75 to 84 percent in firm birth rate (BIRTH_LF).

Results indicate that labour force rate (AGE_14_64) contrary to expectation is significantly and negatively associated with firm birth rate. This finding is not consistent with entrepreneurship literature and indicating that presence of higher pooled labour market in an area has negative effect on new business formation. In terms of human capital variables, university graduate rate (UNI_GRDTS) has positive and significant impact on firm birth rate, whereas high-school graduate rate (HGHSCH_GRDTS) has significant and negative effect. This shows that regions with higher university graduates and lower high-school graduates are predicted to have higher firm birth rate. The possible reason behind this result is that while university graduates prefer to start their own businesses and increase entrepreneurial activity in regions, high-school graduates prefer to work as an employee. In addition, share of female population (FEMALE_TPOP), as expected, has negative and significant relation with firm birth rate. As women have lower accessibility to resource and work experience have lower tendency to start new firm, and therefore, region with higher share of female population have lower estimated firm birth rate. Share of people between 20-40 years (AGE_20_40) is not statistically significant in this model and it has unexpected coefficient. Model 1 was significant ($p < 0.001$) and demographic variables explained a significant part of variation of firm birth rate (BIRTH_LF) $R^2 = 0.84$, $F(6, 19) = 16.94$.

Model 2 regressed firm birth rate (BIRTH_LF) against a set of socio-economic variables such as demand level as measured GDP per capita (GDPpc), growth in demand level as represented by GDP per capita growth rate (GDPpcGrthRt), rate of urbanization (URBAN), population density (POPDEN), share of employment in agricultural (EMP_AGRC), service (EMP_SRVC) and industrial (EMP_INDSTRY) sectors, rate of unemployment (UNEMPL), and financial capital measured as bank deposit per capita (BNKDEPSTpc).

The results demonstrate that urbanization rate (URBAN) is positively and significantly associated with firm birth rate. Also, there is a positive and significant relationship between agglomeration as measured population density (POPDEN) and firm birth rate. These results imply that due to providing rich and diverse labour pool, resources, technological infrastructures, and markets regions with higher urbanization rate and agglomeration rate have higher estimated firm birth rate. Furthermore, firm birth rate is negatively and significantly related to share of employment in industrial (EMP_INDSTRY) sector, as expected. This indicates that compared to service sector the cost of starting a business is generally higher in manufacturing sector, therefore regions with higher share of manufacturing sector have lower firm birth rate. Although they are highly emphasized in recent empirical studies the remaining variables do not have statistically significant effects on firm birth rate. However, as expected, demand as measured GDP per capita (GDPpc) and demand growth as measured GDP per capita growth rate (GDPpcGrthRt), share of employment in agricultural (EMP_AGRC) and service (EMP_SRVC) sectors, and rate of unemployment (UNEMPL) have expected signs. Only financial capital measured as bank deposit per capita (BNKDEPSTpc) has unexpected sign. Model 2 was significant ($p < 0.001$) and socio-economic variables explained a significant part of variation of firm birth rate (BIRTH_LF) $R^2 = 0.62$, $F(9, 16) = 5.46$.

In the following two models, self-employment per 1000 people in labour force (SLFEMP_LF) was used as the other dependent variables against demographic socio-economic, cultural and institutional variables. The goodness of fit (R^2) of the empirical results ranges from 70 to 86 percent in self-employment rate.

Table 7.8: Regression Results Using Firm Birth (BIRTH_LF) and Self-employment (SLFEMP_LF) in Total Labour Force as Dependent Variable at NUTS II Regions, 1990

Variables	Model 1	Model 2	Model 3	Model 4
(Constant)	(3.78) ^{***}	-0.66	(1.50)	(2.79) ^{**}
AGE_14_64	-3.74 ^{**} (2.29)	-	2.21 ^{***} (4.91)	-
UNI_GRDTS	2.55 ^{***} (5.85)	-	-0.20 (0.41)	-
HGHSCH_GRDTS	-1.32 ^{***} (3.43)	-	-0.54 (1.49)	-
FEMALE_TPOP	-9.34 ^{**} (2.39)	-	-0.66 ^{***} (2.92)	-
NET_MIGRATION	0.00 ^{**} (2.12)	-	-0.27 (1.44)	-
AGE_20_40	-2.60 (0.78)	-	-1.85 ^{***} (2.96)	-
GDPpc	-	0.00 (0.33)	-	0.09 (0.28)
GDPpcGrthRt	-	0.32 (1.67)	-	-0.16 (1.43)
URBAN	-	1.89 [*] (1.81)	-	0.13 (0.37)
POPDEN	-	0.22 [*] (1.77)	-	0.12 (0.54)
EMP_AGRC	-	1.21 (0.53)	-	3.45 ^{**} (2.82)
EMP_SRVC	-	0.06 (0.06)	-	1.69 ^{**} (2.39)
EMP_INDSTRY	-	-1.58 [*] (1.76)	-	-1.17 [*] (1.91)
UNEMPL	-	-3.10 (1.15)	-	-0.60 ^{***} (3.47)
FRTRDZONE	-	-	-	0.16 (1.29)
BNKDEPSTpc	-	-0.07 (0.36)	-	-0.08 (0.36)
R Square	0.84	0.75	0.70	0.86
F-Value	16.94 ^{***}	5.46 ^{***}	7.25 ^{***}	8.05 ^{***}
N. of Obs.	26	26	26	26

Notes: * p < .05, ** p < .01, *** p < .001; absolute value of the t-statistics is in parentheses

In Model 4, self-employment rate (SLFEMP_LF) is estimated as a function of demographic variables such as labour force rate, human capital, share of female in total population, net migration, and the share of population 20 to 40 years. The results indicate that rate of labour force (AGE_14-64) has a positive and significant impact on self-employment rate, as expected. Region with higher labour force rate are predicted to have higher self-employment rate. In addition, share of female in total population (FEMALE_TPOP) is negatively and significantly related with self-employment rate, as expected. The result is consistent with arguments in entrepreneurship literature. In addition, contrary expected, the share of population 20 to 40 years (AGE_20-40) has a negative and significant relation with self-employment rate. This indicates that because the vast majority of population in this age group prefer to work as a salaried-employment, regions with higher AGE_20-40 have lower estimated self-employment rate. The remaining variables are not statistically significant and contrary to expectation, human capital variables (UNI_GRDTS and HGHSCH_GRDTS) and net migration rate (NET_MIGRATION) have negative coefficients. Model 4 was significant ($p < 0.001$) and demographic variables explained 0.70 (R^2) the variation in self-employment rate and $F(6, 19) = 7.25$.

In the last model, Model 5, self-employment rate (SLFEMP_LF) is a function of socio-economic variables. The results show that share of employment in agricultural (EMP_AGRC) and service (EMP_SRVC) sector, as expected, have positively and significantly related to self-employment rate. This means that regions with higher share of agriculture and service sector have higher estimated self-employment rate. In addition, share of employment in industrial sector (EMP_INDSTRY) is negatively and significantly associated with self-employment rate, as expected. The results also demonstrate that unemployment rate (UNEMPL) is significantly and negatively related to self-employment rate, implying that because higher unemployment rate results in depressed economy regions with higher unemployment rate have lower estimated self-employment rate. The remaining variables are not statistically significant. Contrary to expectation, GDP per capita growth rate (GDPpcGrthRt) and financial capital as represented bank deposit per capita (BNKDEPSTpc) have negative coefficient. Model 5

was significant ($p < 0.001$) and socio-economic variables explained a significant part of variation of self-employment rate (SLFEMP_LF) $R^2 = 0.86$, $F(11, 14) = 8.05$

7.1.2. Main Findings for the period of 2000

Table 7.9 demonstrates the descriptive statistics of economic growth, entrepreneurship, demographic and socio-economic variables used in the analyses.

Table 7.10 shows the results of Pearson analysis which aims to provide evidence about the relationship between variables. The results show that as a measure of economic development Gross Domestic Product per capita (GDPpc) has a positive and significant correlation with firm birth rate per labour force (BIRTH_LF), firm death rate (DEATH_LF), share of small and medium enterprises (SMEs_TF), labour force (AGE_14-64), human capital variables as represented university graduate rate and high-school graduate rate (UNI_GRDTS and HGHSCH_GRDTS), net migration (NET_MIGRATION), agglomeration as measured population density (POPDEN), change in employment rate (CHEMPL), patent per capita (PATENTpc), total innovations per capita (INNVpc), and financial capital as measured bank deposit per capita (BNKDEPSTpc). On the other hand, GDP per capita has negatively correlated with establishment size (ESTBSIZE). These results are consistent with neoclassical growth theory, endogenous growth theory, clusters theory, innovative milieu, regional innovation system models, human capital theory, and entrepreneurship literature. In terms of entrepreneurship variables, as expected firm birth rate per labour force (BIRTH_LF) is positively and significantly correlated with share of small and medium enterprises (SMEs_TF), labour force (AGE_14_64), university graduate rate and high-school graduate rate (UNI_GRDTS and HGHSCH_GRDTS), net migration (NET_MIGRATION), agglomeration as measured population density (POPDEN), share of population between age of 20-40 years (AGE_20-40), share of service sector (EMP_SRVC) and agricultural (EMP_AGRC) sectors, patent per capita (PATENTpc), total innovations per capita (INNVpc), income tax rate (INCTAX), and financial capital as measured bank deposit per capita (BNKDEPSTpc). In addition, it has negative and significant relation with establishment size (ESTBSIZE) which means that regions with relatively higher numbers of large firms have lower firm birth rate. All these results are

consistent with entrepreneurship literature and thesis hypotheses. See Table 7.10 for the other relations.

Table 7.9: Descriptive Statistics for NUTS II Regions. 2000

Variables	N	Minimum	Maximum	Mean	Std. Deviation
BIRTH_TF	26	0.005	0.050	0.017	0.013
BIRTH_LF	26	0.156	1.651	0.453	0.362
CHBIRTH	26	-0.035	0.118	0.051	0.036
DEATH_TF	26	0.000	0.004	0.001	0.001
DEATH_LF	26	0.002	0.120	0.022	0.024
SLFEMP_LF	26	66.805	176.800	122.500	27.767
ESTBSIZE	26	12.367	37.619	19.463	6.689
SMEs_TF	26	0.987	0.998	0.995	0.003
GDPvGrthRt	26	0.010	0.048	0.032	0.011
GDPpc	26	417956	3091382	1540447	737883
GDPpcGrthRt	26	-0.003	0.050	0.016	0.011
InGDPpc	26	370708	2443077	1302539	600443
AGE_14_64	26	0.510	0.699	0.634	0.056
URBAN	26	0.445	0.907	0.594	0.127
UNI_GRDTS	26	0.017	0.101	0.040	0.019
HGHSCH_GRDTS	26	0.066	0.186	0.110	0.029
FEMALE_TPOP	26	0.474	0.513	0.493	0.010
NET_MIGRATION	26	-130937	407448	0	107379
POPDEN	26	32.964	1928.163	158.022	364.779
AGE_20_40	26	0.276	0.379	0.321	0.027
EMP_AGRC	26	0.080	0.720	0.550	0.166
EMP_SRVC	26	0.210	0.640	0.302	0.102
EMP_INDSTRY	26	0.050	0.380	0.147	0.081
CHEMPL	26	-0.018	0.032	0.007	0.012
UNEMPL	26	0.048	0.168	0.093	0.034
CHUNEMPL	26	0.016	0.117	0.058	0.023
PATENTpc	26	0.000	1.607	0.270	0.396
INNVpc	26	1.227	119.756	21.638	25.986
CHINNVpc	26	0.063	0.585	0.188	0.116
INCTAX	26	0.365	37.082	3.848	7.171
CORPTAX	26	0.057	52.365	3.846	11.178
FRTRDZONE	26	0.000	4.000	0.808	0.981
BNKDEPSTpc	26	58	3299	582	773
Valid N (listwise)	26				

Table 7.10: Correlations Matrix among Variables of NUTS II Regions, 2000

Table 7. 10: Correlations Matrix among Variables of NUTS II Regions, 2000																																	
Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1 BIRTH_TF	1																																
2 BIRTH_LF	.875**	1																															
3 CHBIRTH	.317	.315	1																														
4 DEATH_LF	.242	.594**	.145	1																													
5 DEATH_TF	.371	.508**	.278	.764**	1																												
6 SELFEMP_LF	-.846**	.729**	-.211	-.284	-.478*	1																											
7 ESTBSIZE	.208	-.274	.031	-.757**	-.384	-.087	1																										
8 SMEs_TF	.123	.392*	.046	.539**	.374	-.134	-.488*	1																									
9 GDPpGrHtRt	.263	.464*	.216	.255	-.066	-.143	-.340	.377	1																								
10 GDPpc	.051	.467*	.140	.625**	.247	-.074	-.814**	.747**	.589**	1																							
11 GDPpcGrHtRt	-.365	-.184	-.117	.004	-.301	.350	-.263	.292	.503*	.336	1																						
12 lnGDPpc	.136	.541**	.152	.693**	.353	-.165	-.818**	.719**	.507**	.976**	.138	1																					
13 AGE_14_64	-.280	.169	.024	.685**	.319	.216	-.864**	.691**	.314	.826**	.350	.800**	1																				
14 URBAN	.589**	.741**	.067	.675**	.696**	-.762**	-.462*	.428*	.195	.504**	-.312	.623**	.313	1																			
15 UNL GRDTS	.079	.497**	.057	.839**	.540**	-.096	-.831**	.647**	.300	.777**	.124	.806**	.899**	.563**	1																		
16 HGHSCH_GRDTS	.161	.494*	.172	.756**	.590**	-.227	-.676**	.682**	.211	.692**	.046	.727**	.827**	.596**	.944**	1																	
17 FEMALE_TPOP	-.458*	-.273	-.114	.280	.102	.165	-.457*	-.140	-.047	.140	.377	.094	.284	-.042	.157	.044	1																
18 NET_MIGRATION	.372	.679**	.112	.802**	.500**	-.288	-.602*	.624**	.385	.644**	-.044	.710**	.583**	.647**	.712**	.626**	-.101	1															
19 POPDEN	.407	.660**	.256	.662**	.380	-.457*	.577**	.414*	.522*	.671**	-.051	.731**	.393*	.631**	.501**	.421*	.164	.630**	1														
20 AGE_20_40	.250	.599**	.237	.774**	.497**	-.257	-.706**	.743*	.452*	.806**	.019	.847**	.802**	.640**	.886**	.892**	-.099	.773**	.637**	1													
21 EMP_AGRC	.436*	.766**	.163	.779**	.596**	-.491*	-.720**	.712**	.469*	.819**	.012	.871**	.652*	.844**	.807**	.777**	-.032	.796**	.737**	.870**	1												
22 EMP_SRVC	.624*	.850**	.101	.677**	.595**	-.585**	-.506**	.585**	.322	.599**	-.184	.684**	.446*	.830**	.721**	.732**	-.275	.721**	.606**	.781**	.913**	1											
23 EMP_INDSTRY	.022	.422*	.174	.719**	.448*	-.185	-.857**	.678*	.481*	.895**	.238	.900**	.772*	.628**	.724*	.638**	.318	.671**	.719**	.755**	.847**	.566**	1										
24 UNEMPL	.523**	.711**	.382	.497**	.278	-.434*	-.393*	.312	.632*	.565**	-.258	.645**	.316	.566**	.487*	.440*	-.204	.623**	.729**	.691**	.669**	.608**	.537**	1									
25 CHEMEMPL	.800**	.624*	.157	.171	.406*	.851**	.210	-.116	.028	-.113	-.521**	.010	-.440*	.615**	-.108	-.029	-.246	.169	.424*	.041	.279	.450*	-.029	.362	1								
26 CHUNEMPL	.603*	.692**	.234	.380	.330	-.405*	-.120	.425*	.430*	.356	-.299	.437*	.131	.488**	.318	.304	-.531**	.707**	.479*	.495*	.537**	.572**	.301	.688**	.362	1							
27 PATENTpc	.367	.660**	.104	.759**	.510**	-.290	-.579**	.648*	.349	.737**	-.020	.796**	.686**	.677**	.826**	.784**	-.059	.814**	.532*	.803**	.803**	.741**	.647**	.587**	.092	.564**	1						
28 INNvpc	.036	.426*	.084	.805**	.582*	-.145	-.847**	.553*	.319	.773**	.048	.825**	.782*	.695**	.803**	.716**	.256	.722*	.597**	.775**	.811**	.601**	.886**	.505**	-.037	.330	.752**	1					
29 CHINNvpc	-.134	-.230	-.079	-.344	-.293	.233	.258	-.101	-.046	-.216	.056	-.251	-.139	-.305	-.164	-.070	-.413*	-.189	-.259	-.108	-.252	-.080	-.409*	-.215	-.132	.065	-.202	-.361	1				
30 INCTAX	.256	.806**	.020	.885**	.596**	-.295	-.766**	.492*	.448*	.719**	.017	.783**	.653**	.731**	.783**	.664**	.213	.806**	.779**	.761**	.822*	.690**	.779**	.630**	.223	.471*	.799**	.866**	-.264	1			
31 CORPTAX	.402	.722**	.286	.827**	.588**	-.420*	-.692**	.589*	.477*	.800**	.013	.860**	.649*	.767**	.787**	.752**	.115	.759**	.774**	.831**	.891**	.764**	.808**	.696**	.228	.482*	.858**	.844**	-.311	.889**	1		
32 FRTRDZONE	.213	.327	.071	.427*	.575**	-.165	-.249	.566**	.197	.355	-.029	.385	.250	.379	.288	.292	-.109	.323	.356	.367	.443*	.403*	.415*	.181	.191	.384	.298	.429*	-.178	.412*	.390*	1	
33 BNKDEPSTpc	.075	.505**	.150	.861**	.499**	-.139	-.870**	.490*	.866**	.249	.875**	.890**	.580**	.940**	.871**	.296	.735**	.639**	.868**	.837**	.659**	.854**	.517**	-.097	.281	.814**	.850**	-.268	.828**	.875**	.266	1	
** . Correlation is significant at the 0.01 level (2-tailed). * . Correlation is significant at the 0.05 level (2-tailed).																																	

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

*, Correlation is significant at the 0.05 level (2-tailed).

7.1.2.1. The results of the contribution of entrepreneurship on regional economic development and economic growth, NUTS II Regions, 2000

This sub-section provides empirical results regarding the first research question that examines the impact of entrepreneurship on regional economic development and growth. In this context, three different analyses were conducted. As done in 1990, the study used Gross Domestic Product per capita (GDPpc) (2000) as measure of the level of economic development, whereas used growth in value of GDP (1990-2000) and growth in per capita GDP (1990-2000) as the measures of regional economic growth, respectively, and regressed against entrepreneurship variables and other demographic and socio-economic variables.

The level of economic development (GDP per capita) and entrepreneurship variables

In this framework, table 7.11 demonstrates the result of multiple regression analysis using the level of GDP per capita as dependent variable at NUTS II regional level for the year 2000. GDP per capita level is regressed against entrepreneurship variables firm birth rate per total firms (BIRTH_TF), firm birth rate per 1000 people in labour force (BIRTH_LF), change in firm birth rate per 1000 people in labour force (CHBIRTH), firm death rate (DEATH_LF), self-employment rate (SLFEMP_LF), establishment size per regions (ESTSIZE), and share of SMEs in total firms (SMEs_TF); and other socio-economic variables human capital (UNI_GRDTS and HGHSCH_GRDTS), total labour force (AGE_14-64), net migration (NET_MIGRATION), unemployment rate (UNEMPL), patent per capita (PATENTpc), numbers of free trade zones (FRTRDZONE), and financial capital represented as bank deposit per capita (BNKDEPSTpc). The goodness of fit (R^2) of the empirical results ranges from 79 to 99 percent in GDP per capita. Table 7.11 presents the results of eight regression models.

In Model 1, the level of GDP per capita is estimated as a function of entrepreneurship variables. The results show that while firm birth rate per total firms (BIRTH_TF) is negatively and significantly associated with GDPpc, firm birth rate per labour force (BIRTH_LF) is positively and significantly related with GDP per capita. As mentioned earlier, firm birth rate per labour force (BIRTH_LF) was created based on Labour Market Approach; whereas firm birth rate per total firms (BIRTH_TF) was created

based on Ecological Approach. The use of ecological approach as a measure of normalization has been criticized by many researchers both in theoretical and empirical studies. For instance Garofoli (1994) and Audretsch and Fritsch (1994) have argued that the ecological approach results in measurement biases by overstating firm birth rates in regions which have larger number of small firms and by underestimating the firm birth rates in regions where large firms are dominated (Gaygısız and Köksal, 2003). This result is similar to previous results in 1990. This means that regions with lower firm birth rate per total firms (based on Ecological Approach) and higher firm birth rate per labour force (Labour Market Approach) are predicted to have higher economic development level (GDPpc). As mentioned earlier because some regions dominated by large firms and other have large numbers of small firms, the impact of BIRTH_TF on GDP per capita can show differences. The remaining entrepreneurship variables (growth in firm birth rate (CHBIRTH) and firm death rate (DEATH_LF)) are not statistically significant, but both of them have expected signs. Model 1 was significant ($p < 0.001$) and entrepreneurship variables explained a significant proportion of variation of GDPpc level $R^2 = 0.79$, $F(5, 20) = 14.75$.

Model 2 to added self-employment rate (SLFEMP_LF), which is the other measure of entrepreneurship used in this study, to model 1. As observed, the impacts of firm birth rate per total firms (BIRTH_TF) and firm birth rate per labour force (BIRTH_LF) on economic development are same as model 1. Furthermore, in this model firm death rate (DEATH_LF) as expected has negative and significant relationship with the level GDP per capita. This means that regions with higher firm death rate have lower estimated GDP per capita level. Self-employment rate and growth in firm birth rate do not have statistically significant effect on GDPpc. However, contrary to expectation self-employment rate has negative coefficient, which means that as most of self-employment in Turkey are necessity-driven and non-innovative they have limited contribution on regional economic development, and therefore regions with higher self-employment may have lower level of economic development. Model 2 was also significant ($p < 0.001$) with $R^2 = 0.81$, $F(5, 20) = 16.97$.

Model 3 contains entrepreneurship variables and labour force variable (AGE_14-64). The results show that labour force has a statistically significant and positive relation

with the level of economic development (GDPpc). The result is consistent with neoclassical models which paid a special attention on the accumulation of labour. This means that an increase in labour force rate gives 0.62 TL increase in GDP per capita. The relationships between entrepreneurship variables and GDP per capita level are similar to model 2.

Table 7.11: Regression Results Using GDP per Capita as Dependent Variable (NUTS II, 2000)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Constant	(2.43)**	(3.81)***	(5.37)***	(4.98)***	(4.79)***	(3.91)***	(2.58)**
BIRTH_TF	-1.73*** (4.66)	-2.21*** (5.83)	-1.19** (2.58)	-1.12** (2.25)	-2.10*** (6.86)	-1.16* (1.91)	-
BIRTH_LF	2.09*** (4.79)	2.35*** (6.47)	1.47*** (3.53)	1.30** (2.75)	1.98*** (6.39)	1.58** (2.82)	0.49*** (3.86)
CHBIRTH	0.07 (0.66)	0.08 (0.80)	0.05 (0.56)	0.03 (0.28)	0.13 (1.49)	-0.03 (0.37)	-0.01 (0.09)
DEATH_LF	-0.08 (0.39)	-0.33* (1.82)	-0.47*** (2.92)	-0.58*** (3.25)	-0.54*** (3.39)	-0.37** (2.55)	-0.51*** (3.95)
SLFEMP_LF	-	-0.31 (1.60)	-0.26 (1.59)	-0.12 (0.67)	-0.40** (2.50)	-0.20 (1.24)	0.22** (2.54)
ESTBSIZE	-	-	-	-	-	-	-0.47*** (3.24)
SMEs_TF	-	-	-	-	-	-	0.17 (1.50)
AGE_14_64	-	-	0.62*** (3.06)	-	-	0.99** (2.71)	0.98*** (3.25)
UNI_GRDTS	-	-	-	-	-	-1.15* (2.00)	-1.07*** (5.01)
HGHSCH_GRDTS	-	-	-	-	-	0.09 (0.21)	-
NET_MIGRATION	-	-	-	-	-	-	-0.17 (1.70)
UNEMPL	-	-	-	-	-	-	0.35*** (3.48)
PATENTpc	-	-	-	-	0.48*** (3.45)	0.24 (1.42)	0.29** (2.84)
FRTRDZONE	-	-	-	-	-	-	0.04 (0.58)
BNKDEPSTpc	-	-	-	0.77*** (2.91)	-	0.38 (1.30)	0.58** (2.70)
R Square	0.79	0.81	0.87	0.87	0.88	0.95	0.99
F-Value	14.75***	16.97***	21.63***	20.82***	23.86***	26.56***	61.98***
N. of Obs.	26	26	26	26	26	26	26

Notes: * $p < .10$, ** $p < .05$, *** $p < .01$; absolute value of the t-statistics is in parentheses

Model 4 added financial capital as measured bank deposit per capita (BNKDEPSTpc) to model 2. As indicated in table the relationship between bank deposit per capita and GDP per capita is positive and significant, as expected. This means that those regions with higher levels of financial capital are predicted to have higher economic development levels (GDPpc). Among entrepreneurship variables firm birth per total labour force has positive and significant effect on GDP per capita level, whereas firm birth per total firms and firm death rate has negative and significant influence on the level of economic development (GDPpc). Self-employment rate and growth in firm birth rate are not statistically significant. These indicate that among entrepreneurship variables only firms birth per labour force leads to regions to achieve higher levels of economic development. Model 5 was significant ($p < 0.001$) and variables explained an important part of variation of the level of GDPpc $R^2 = 0.87$, $F(6, 19) = 20.82$.

Model 5 added patent per capita (PATENTpc) to model 2. As observed, the level of GDP per capita is significantly and positively associated with patent per capita (PATENTpc). This support the innovative milieu and regional innovation system theories and implying that regions with higher patent per capita have higher estimated economic development levels (GDPpc). The relationship between entrepreneurship variables and GDP per capita is similar to previous models. However, self-employment rate (SLFEMP_LF) has negative and significant effect on GDP per capita level. Model 6 was significant ($p < 0.001$) and $R^2 = 0.88$, $F(6, 19) = 23.86$.

In Model 6, GDP per capita was regressed against all these variables and human capital variables which are university graduate rate (UNI_GRDTS) and high-school graduate rate (HGHSCH_GRDTS). The results show that in terms of entrepreneurship variables, three of them have significant effect on GDP per capita. While firm birth per labour force has positive and significant associations with the level of GDPpc, firm birth per total firms and firm death rate have negative and significant relations. Furthermore, consistent with neoclassical growth models, there is a positive and significant relationship between labour force (AGE_14-64) and the level of GDP per capita. Conversely, as a measure of human capital university graduate rate (UNI_GRDTS) is found to have statistically significant and negative influence on GDP per capita. Contrary to human capital theory, those regions with higher university graduate rate are

predicted to have lower economic development levels (GDPpc). This implies that university graduates do not play a key role in determining the level of economic development. As mentioned above, because the majority of university graduates have started to be unemployed and/or worked as salaried employees instead of being self-employment or starting new businesses, the higher number of university graduates can be negatively associated with economic development level in the context of Turkish regions. The remaining variables are not statistically significant. It is surprising that the variable aims to investigate the effect of innovative activities as measured patent per capita (PATENTpc) on regional economic development is not statistically significant, but it has expected sign. Similarly, financial capital as represented by bank deposit per capita (BNKDEPSTpc) and the other human capital variables do not have statistically significant effect on GDP per capita although they were frequently used in recent empirical studies and growth models. Model 7 was significant ($p < 0.001$) and $R^2 = 0.95$, $F(10, 15) = 26.56$.

Besides these variables, the study added other socio-economic variables and excluded firm birth rate per total firms (BIRTH_TF) to Model 6. The results of Model 7 indicate that as expected firm birth rate per labour force (BIRTH_LF) and self-employment rate (SLFEMP_LF) are positively and significantly associated with GDP per capita level; and firm death rate (DEATH_LF) is negatively and significantly related to the level of GDPpc. This means that regions with higher firm birth rate and self-employment rate are predicted to have higher economic development levels (GDPpc). In addition, establishment size (ESTBSIZE) and GDP per capita level has significant and negative relationship, implying that regions relatively have higher large firms have lower estimated GDP per capita. Similar to previous models, labour force (AGE_14-64) has positive and significant relation with the level of regional economic development. Contrary to expectation, regions with higher university graduates are predicted to have lower GDP per capita. This result is not consistent with human capital theory and recent empirical studies. In addition, unemployment rate is positively and significantly related to GDP per capita. This may result from mass migration which leads to unemployment growth in developed regions. Consistently with recent growth theories and studies, patent per capita (PATENTpc) and financial capital as represented by bank deposit per

capita (BNKDEPSTpc) have positive and significant associations with GDP per capita level. This shows that consistently with innovative milieu and regional innovation system models, those regions with higher innovative activities and financial capital are predicted to have higher economic development levels. The remaining variables are found to be statistically insignificant, and while share of SMEs in total firms (SMEs_TF) and the numbers of free trade zones (FRTRDZONE) have positive coefficient, net migration (NET_MIGRATION) has negative coefficient. Model 7 was significant ($p < 0.001$) and all variables explained a significant proportion of variation of GDP per capita $R^2 = 0.99$, $F(13, 12) = 61.98$.

The level of economic growth (measured by growth in GDP value) and entrepreneurship variables

Table 7.12 shows the results of GDP value growth rate equation for NUTS II regions for the year 2000. GDP value growth rate (GDPvGrthRt) is estimated as a function of entrepreneurship variables which are firm birth rate per total firms (BIRTH_TF), firm birth rate per 1000 people in labour force (BIRTH_LF), firm death rate (DEATH_LF), self-employment rate (SLFEMP_LF), and share of SMEs in total firms (SMEs_TF); and a set of socio-economic variables such as labour force (AGE_14-64), human capital as represented by university graduate rate (UNI_GRDTS), net migration (NET_MIGRATION), agglomeration as measured population density (POPDEN), change in employment rate (CHEMPL), patent per capita (PATENTpc), and financial capital represented as bank deposit per capita (BNKDEPSTpc). The goodness of fit (R^2) of the empirical results ranges from 47 to 84 percent in GDP value growth rate (GDPvGrthRt). Table 7.12 presents the results of three regression models.

In this framework, the first model, Model 1, includes only the first entrepreneurship variables. The model was significant ($p < 0.001$) and explains 47% of variation in GDP value growth rate with a computed $F(4, 21) = 4.72$. The results demonstrate that similar to above models, firm birth rate per total firms (BIRTH_TF) and firm death rate (DEATH_LF) have negative and significant associations with GDP value growth rate. On the other hand, firm birth rate per 1000 people in labour force (BIRTH_LF) is positively and significantly associated with GDPvGrthRt. This means that regions with

higher firm birth per labour force are predicted to have higher economic growth rate than regions with higher firm birth rate per total firms. However, as can be seen, self-employment rate does not have statistically significant effect on GDP value growth rate.

Table 7.12: Regression Results Using GDP Value Growth Rate as Dependent Variable (NUTS II, 2000)

Variables	Model 1	Model 2	Model 3
Constant	-0.30 (1.01)	-0.21 (0.74)	-3.61* (2.10)
BIRTH_TF	-0.40* (1.76)	-0.28 (1.22)	-
BIRTH_LF	0.75*** (3.78)	0.47** (1.93)	0.75*** (3.61)
DEATH_TF	-0.07** (2.44)	-0.06** (2.11)	-0.05** (2.24)
SLFEMP_LF	0.00 (0.17)	0.00 (0.00)	0.00 (0.46)
SMEs_TF	-	-	0.24 (1.51)
AGE_14_64	-	-	3.81** (2.10)
UNI_GRDTS	-	-	-1.36** (2.90)
NET_MIGRATION	-	-	-0.00** (2.11)
POPDEN	-	-	-0.20** (2.70)
CHEMPL	-	4.97* (1.85)	6.56*** (2.73)
PATENTpc	-	-	-0.30** (2.41)
BNKDEPSTpc	-	-	-0.08* (0.47)
R Square	0.47	0.55	0.84
F-Value	4.72***	4.89**	5.12***
N. of Obs.	26	26	26

Notes: * p < .10, ** p < .05, *** p < .01; absolute value of the t-statistics is in parentheses

Model 2 added employment growth rate (CHEMPL) to model 1. According to the findings, employment growth rate is positively and significantly associated with GDP value growth rate. This means that regions with higher employment growth rate have higher estimated GDP value growth rate. In terms of entrepreneurship variables, as expected firm birth rate per labour force (BIRTH_LF) has positive and significant

influence on economic growth, while firms death rate (DEATH_LF) has negative and significant effect. The result is consistent with thesis hypothesis and entrepreneurship literature. The model was significant ($p < 0.001$) and explains 55% of variation in GDP value growth rate with a computed $F(5, 20) = 4.89$.

The last model, Model 3, regressed GDP value growth rate (GDPvGrthRt) against all variables. The results show that similar to previous models firm birth rate per labour force (BIRTH_LF) is positively and significantly related with the level of economic growth (GDP value growth rate), whereas firm death rate (DEATH_LF) is significantly and negatively related, as expected. Self-employment rate (SLFEMP_LF) and share of SMEs in total firms (SMEs_TF) are not statistically significant but both have positive signs, as expected. These indicate that regions with higher entrepreneurial activity have higher economic growth rate. Furthermore, the variable used to represent labour force (AGE_14_64) has positive and significant association with GDP value growth as expected. Regions with higher labour force rate are estimated to have higher economic growth rate. Contrary to human capital theory, university graduate rate (UNI_GRDTS) has negative and significant influence on GDP value growth rate. This implies that regions with higher university graduate rate have lower economic growth rate. The possible reason behind this result is that although the rates of university graduate increase in many regions in Turkey in recent years due to the lack of appropriate business opportunities in these regions the majority of university graduates become unemployed. Further, as most of university graduates in Turkey have a tendency to become wage-employees, they do not start new businesses, and eventually, not contribute to economic growth. Employment growth rate has positive and significant impact on regional economic growth rate. In addition, contrary to expectation net migration (NET_MIGRATION), agglomeration as measured population density (POPDEN), patent per capita (PATENTpc), and financial capital represented as bank deposit per capita (BNKDEPSTpc) are negatively and significantly associated with GDP value growth rate. It is noteworthy that during this period less developed regions have experienced higher economic growth rate especially with the direct incentives and supports given by government. Therefore, all these results are not consistent with recent growth theories. On the other hand, employment growth rate has highly significantly

positive effect on GDP value growth ($\beta = 6.56$, $p < .05$). Model 3 was significant ($p < 0.001$) and all variables explained a significant proportion of variation of GDP value growth $R^2 = 0.84$, $F(12, 13) = 5.12$.

The level of economic growth (measured by growth in GDP per capita) and entrepreneurship variables

As indicated in Table 7.13 GDP per capita growth rate is used as the second measure of the level of economic growth and is regressed against entrepreneurship variables and a set of socio-economic variables. The table shows the results of three models and the goodness of fit (R^2) of the empirical results varies from 55 to 94 percent in GDP per capita growth rate.

In the first model, Model 1, GDP per capita growth rate is estimated as a function of entrepreneurship variables and change in unemployment rate (CHUNEMPL). The results demonstrate that the impacts of entrepreneurship variables are similar to above models where firm birth rate per labour force (BIRTH_LF) and self-employment rate (SLFEMP_LF) are positively and significantly associated with GDP per capita growth rate (GDPpcGrthRt); and firm birth per total firm (BIRTH_TF) is negatively and significantly related to the level of economic growth (GDPpcGrthRt). In addition, although firm death rate (DEATH_LF) is not statistically significant, it has expected sign. All these are consistent with entrepreneurship literature and hypothesis, indicating that regions with higher firm birth rate (based on labour market approach) and self-employment rate have higher estimated GDP per capita growth rate. As observed, establishment size (ESTBSIZE) is positively and significantly related to GDP per capita growth rate, implying that regions have relatively higher numbers of large firms have higher economic growth rate. Moreover, as expected unemployment growth rate has negatively and significantly associated with GDPpc growth rate. Model 1 was significant ($p < 0.01$) and explains 55% of variation in GDP per capita growth rate with a computed $F(6, 19) = 3.86$.

Table 7.13: Regression Results Using GDP per Capita Growth Rate as Dependent Variable (NUTS II, 2000)

Variables	Model 1	Model 2	Model 3
Constant	-0.68*** (2.89)	-0.91*** (3.59)	-1.04*** (3.44)
BIRTH_TF	-0.30*** (3.07)	-0.28** (2.32)	-0.28** (2.83)
BIRTH_LF	0.30*** (3.18)	0.31*** (2.64)	0.32*** (3.46)
DEATH_TF	-0.00 (0.92)	0.01 (0.46)	-0.00 (0.10)
SLFEMP_LF	0.00** (1.98)	0.00 (1.53)	0.00*** (3.02)
ESTBSIZE	0.25*** (2.71)	0.23** (2.16)	0.26** (2.68)
SMEs_TF	-	-	-0.02 (0.88)
lnGDPpc	-	-	-0.00 (1.57)
AGE_14_64	-	0.23 (1.46)	0.59*** (3.98)
UNI_GRDTS	-	-0.11** (2.47)	-0.06 (0.77)
HGHSCH_GRDTS	-	-	-0.84** (2.48)
NET_MIGRATION	-	-	0.00 (0.58)
POPDEN	-	-0.01 (0.94)	-0.01** (2.46)
CHUNEMPL	-0.28** (2.42)	-0.30** (2.30)	-0.31** (2.14)
CHINNVpc	-	-	0.03*** (3.91)
FRTRDZONE	-	-	0.01* (2.02)
BNKDEPSTpc	-	0.01 (0.40)	0.04** (2.28)
R Square	0.55	0.67	0.94
F-Value	3.86***	3.08**	7.34***
N. of Obs.	26	26	26

Notes: * p < .10, ** p < .05, *** p < .01; absolute value of the t-statistics is in parentheses

Model 2 contains entrepreneurship variables and five socio-economic variables such as labour force (AGE_14_64) human capital as represented by university graduate rate (UNI_GRDTS), agglomeration as measured population density (POPDEN), change in unemployment rate (CHUNEMPL), and financial capital represented as bank deposit per capita (BNKDEPSTpc). The model was significant at the 95 % level with R^2 of 0.67, $F(10, 15) = 3.08$. The results demonstrate that entrepreneurship variables have same relations with GDP per capita growth rate as in model 1. However, contrary to expectation, university graduate rate (UNI_GRDTS) is negatively and significantly associated with economic growth (GDPpcGrthRt). The model is not consistent with human capital theory. In addition, unemployment growth rate is negatively and significantly related to GDP per capita growth rate. This means that regions with higher unemployment growth rate have lower estimated economic growth rate. The remaining variables are found to be statistically insignificant. Although they are highly emphasized in recent growth models labour force rate (AGE_14_64) and financial capital represented as bank deposit per capita (BNKDEPSTpc) do not have significant effects, but both have expected signs. On the other hand, agglomeration as measured population density (POPDEN) has unexpected sign. These mean that regions with higher levels of financial and physical capital and lower agglomerations rate are estimated to have higher economic growth rate.

Model 3 added several other socio-economic variables such as high-school graduate rate (HGHSCH_GRDTS), share of SMEs in total firms (SMEs_TF), initial GDP per capita (InGDPpc), net migration (NET_MIGRATION), innovation growth rate (CHINNVpc), and numbers of free trade zones (FRTRDZONE) to model 2. As can be seen, the relationship between entrepreneurship variables and GDP per capita growth rate is similar to previous models. Share of SMEs in total firms (SMEs_TF) is not statistically significant and contrary to expectation it has negative coefficient. On the contrary, establishment size (ESTBSIZE) is positively and significantly associated with GDP per capita growth rate. These results show that those regions have relatively higher numbers of large firms and higher firm birth rates are predicted to have higher level of GDP per capita growth. Although the relationship between GDP per capita growth rate and initial GDP per capita is not significant, the coefficient is negative. This is consistent with the

theory of convergence, implying that regions that have lower initial GDP per capita have faster economic growth rate than regions with higher initial GDPpc. Labour force rate (AGE_14-64) is positively and significantly associated with the level of regional economic growth (GDPpcGrthRt), as expected. The result is consistent with neoclassical growth models. On the other hand, contrary to expectation high-school graduate rate has negative and significant effect on economic growth. This means that regions with higher rate of skilled-labour have lower GDP per capita growth rate. In addition, as the other measure of human capital university graduate rate is not significant but has negative coefficient. These results are not consistent with the arguments in human capital theory. Contrary to cluster and new industrial district theory, agglomeration as measured population density (POPDEN) has a negative and significant effect on economic growth ($\beta = -0.01$, $p < 0.05$). This suggests that regions with higher rate of population density have lower economic growth rate. Similarly, unemployment growth rate has negative and significant influence on GDPpc growth rate. This means that an increasing rate of unemployment leads to declining GDP per capita growth rate. The results also show that innovation growth rate (CHINNVpc), numbers of free trade zones (FRTRDZONE), and bank deposit per capita (BNKDEPSTpc) are positively and significantly associated with economic growth rate. Model 1 was significant ($p < 0.01$) and explains 94% of variation in GDP per capita growth rate with a computed $F(17, 8) = 7.34$.

7.1.2.2. The relationship between entrepreneurship and economic development stages of NUTS II Regions, 2000

The sub-section aims to provide empirical results about the second research question at NUTS II regional level for the year 2000. The question aims to capture the relationship between entrepreneurship and economic development level of regions. It is hypothesized that there is a significant difference between means of each group. In addition, it is expected that regions with low and high economic development level have higher firm birth rate per labour force (BIRTH_LF) and self-employment rate (SLFEMP_LF) than regions at the middle stage of economic development. In other words, a U-shaped relationship between entrepreneurship and economic development levels is expected. Within this framework, the thesis used ANOVA to investigate this relationship.

Table 7.14: ANOVA Results of BIRTH_LF at NUTS II Regions, 2000

	Groups	N	Mean	SD	F	p
GDPpc	High	6	0.868	0.559	8.639	0.002
	Low	4	0.442	0.203		
	Medium	16	0.301	0.111		
	Total	26	0.453	0.362		

At first, firm birth rate per labour force (BIRTH_LF) used as the first dependent variable. Table 7.14 demonstrates that regions with high economic development level (M =0.868, SD = 0.56) have higher level of new business formation than region with medium (M =0.301, SD = 0.11) and low (M =0.442, SD = 0.20) economic development level. The results are consistent with entrepreneurship literature but it is also expected regions with low economic development level should have higher firm birth rate than region with high economic development level. These results suggest that as regions with high economic development have good infrastructure, high level innovative activities, pooled skilled labour force, and knowledge spillover which are the key drivers of new business formation, such regions have higher firm birth rate. In addition, keep in mind that as regions at low economic development have high rate of informal sector, they may have higher firm birth rate than regions at high economic development level. Table also shows that regions at early stage of economic development have higher mean score than regions at middle stage of economic development. Therefore, all these results support the thesis hypothesis and entrepreneurship literature which indicate that there is a U-shaped relationship between the level of entrepreneurial activity and economic development level. Moreover, the one-way ANOVA results also indicate that the differences between mean scores of these three groups are statistically significant $F_{2,23} = 8.64$; $P < .01$).

In the second model, self-employment rate per 1000 people in labour force (SLFEMP_LF) was used as the second measure of entrepreneurship in ANOVA analysis. The results in Table 7.15 indicate that contrary to expectation, regions with low

(M =110.17, SD =20.95) and high economic development level (M =99.43, SD =27.80) have lower self-employment rate than regions with medium economic development level (M =134.23, SD =23.22). Further, regions at the early stage of economic development have lower self-employment rate than regions at the advanced stage of economic development. These results are not consistent with entrepreneurship literature and the thesis hypothesis, expecting that as regions at the early stage of economic development have bad infrastructure and institutional structures and less business opportunities many people are forced to being self-employment which are mainly informal and necessity driven and therefore such regions have higher self-employment rate. The results indicate that there is an inverse U-shaped relationship between self-employment rate and economic development level of regions. Also, ANOVA results found the difference between mean scores of these categories statistically significant $F_{2,23} = 5.20$; $P < .05$).

Table 7.15: ANOVA Results of SLFEMP_LF at NUTS II Regions, 2000

	Groups	N	Mean	SD	F	p
GDPpc	High	6	99.433	27.803	5.201	0.014
	Low	4	110.175	20.951		
	Medium	16	134.232	23.224		
	Total	26	122.500	27.767		

7.1.2.3. The effects of certain regional characteristics on entrepreneurship at NUTS II Regions, 2000

The main aim of this sub-section is to present empirical findings about the third research question. In other words, it aims to explore the impacts of certain demographic, socio-economic, cultural and institutional characteristics of regions on regional entrepreneurial activity at NUTS II regional level for the year 2000. The study used two measure of entrepreneurship as dependent variables; firm birth per 1000 people in the labour force (BIRTH_LF) and self-employment per 1000 people in labour force (SLFEMP_LF). The

first two models (Model 1 and 2) used BIRTH_LF as dependent variable; the other two models (Model 3 and 4) used SLFEMP_LF as the other dependent variable.

Within this framework, in Model 1 firm birth rate (BIRTH_LF) is estimated as a function of demographic variables such as rate of labour force (AGE_14_64), human capital measured as university graduate rate and high-school graduate rate (UNI_GRDTS and HGHSCH_GRDTS), share of female in total population (FEMALE_TPOP), net migration rate (NET_MIGRATION), and share of people between 20-40 years (AGE_20_40). The goodness of fit (R^2) of the two empirical results varies from 83 to 91 percent in firm birth rate (BIRTH_LF).

Table 7.16 demonstrates that relationship between firm birth rate (BIRTH_LF) and labour force rate (AGE_14_64) contrary to expectation is negative and significant. The result does not support hypothesis and entrepreneurship literature because presence of pooled labour market is expected to have positive impact on new businesses formation, however; the result indicates that regions with higher rate of labour force (AGE_14_64) have lower estimated firm birth rate. In addition, firm birth rate (BIRTH_LF) is positively and significantly associated with university graduate rate (UNI_GRDTS), as expected. The results is consistent with entrepreneurship literature and thesis hypothesis and implying that as university graduates generate new knowledge, innovations and businesses opportunities, regions with higher university graduate rate are predicted to have higher firm birth rate. Furthermore, share of population 20 to 40 years (AGE_20_40) has positive and significant influence on the formation of new firms, as expected. The result suggests that regions with higher share of people between age 20-40 have higher estimated firm birth rate. The remaining variables are not statistically significant. While net migration (NET_MIGRATION) has expected sign, high-school graduate rate (HGHSCH_GRDTS) and share of female in total population (FEMALE_TPOP) do not have expected signs. Model 1 was significant ($p < 0.001$) and demographic variables explained a significant proportion of variation of BIRTH_LF $R^2 = 0.83$, $F(6, 19) = 15.66$.

In the second model, Model 2, firm birth rate (BIRTH_LF) is regressed against a set of socio-economic variables; demand as measured GDP per capita (GDPpc) and growth in demand rate as represented by GDP per capita growth rate (GDPpcGrthRt), rate of urbanization (URBAN), population density (POPDEN), share of employment in agricultural (EMP_AGRC), service (EMP_SRVC) and industrial (EMP_INDSTRY) sectors, rate of unemployment (UNEMPL), change in the rate of unemployment (CHUNEMPL), and financial capital measured as bank deposit per capita (BNKDEPSTpc).

The results show that among socio-economic variables rate of unemployment (UNEMPL) and growth in unemployment (CHUNEMPL) are positively and significantly associated with firm birth rate. This implies that as unemployment rates increase, individual with low prospect for employment alternatives may be pushed into self-employment that results in positive relationship between unemployment and entrepreneurship, and therefore, regions with higher unemployment rate have higher estimated firm birth rate for the period of 2000. However, there is a negative and significant relationship between share of SMEs (SMEs_TF) and firm birth rate. This result is not consistent with entrepreneurship literature and the thesis hypothesis which indicate that as the presence of entrepreneurship in a region provides more convenient environments and offers role model to individuals having entrepreneurial intention, regions with higher share of small and innovative firms are expected to have higher levels of new business formation. Conversely, although establishment size (ESTBSIZE) has insignificant effect on firm birth rate it has positive coefficient that means that regions with higher share of large firms have higher estimated firm birth rate. Furthermore, financial capital measured as bank deposit per capita (BNKDEPSTpc) is found to have statistically significant and positive relationship with firm birth rate. This result supports the thesis hypothesis and implying that as the availability and accessibility of financial capital are crucial for starting new businesses; regions with higher levels of financial capital are predicted to have higher firm birth rate. The remaining variables are not statistically significant. It is surprising that the variables aim to explore the effect of demand (GDPpc and GDPpcGrthRt) on new business formation rate are not statistically significant, but both have expected signs, referring that

increasing in demand rates results in an increase in firm birth rate. Although they are highly emphasized in entrepreneurship literature agglomeration as represented by population density (POPDEN) is also found to be statistically insignificant, but it has expected sign that means that regions with lower population density are estimated to have higher firm birth rate. Furthermore, share of employment in agricultural (EMP_AGRC), service (EMP_SRVC), and industrial (EMP_INDSTRY) sectors are not significant, but they have expected signs. Model 2 was significant ($p < 0.001$) and explains 93% of variation in firm birth rate with a computed $F(12, 13) = 14.87$.

The following three models are based on self-employment per 1000 people in labour force (SLFEMP_LF). The goodness of fit (R^2) of the empirical results ranges from 81 to 94 percent in self-employment rate.

Model 3 estimated self-employment rate (SLFEMP_LF) as a function of demographic variables such as labour force rate, human capital, share of female in total population, net migration, and the share of population 20 to 40 years. The results show that rate of labour force (AGE_14-64) is positively and significantly associated with self-employment rate. This suggests that an increase in labour force rate leads to an increase in self-employment rate. In terms of human capital variables university graduate rate (UNI_GRDTS) is not significant, but it has positive coefficient, implying that those regions have higher university graduate rate have higher self-employment rate. On the other hand, high-school graduate rate (HGHSCH_GRDTS) is significantly and negatively related to self-employment rate. This is not consistent with entrepreneurship literature and thesis hypothesis. In addition, share of female in total population (FEMALE_TPOP) has negative and significant influence on self-employment rate, as hypothesized. As women have lower tendency to being self-employment regions with higher share of female have lower estimated self-employment rate. Similarly, share of people between age 20-40 (AGE_20_40) is negative and significant. This result is not consistent with thesis hypothesis which indicating that AGE_20_40 has positive and significant effect on regional entrepreneurship. Net migration (NET_MIGRATION) is not statistically significant and has unexpected sign. Model 3 was significant ($p < 0.001$) and demographic variables explained 0.81 (R^2) the variation in self-employment rate and $F(6, 19) = 13.63$.

Table 7.16: Regression Results Using Firm Birth (BIRTH_LF) and Self-employment (SLFEMP_LF) in Total Labour Force as Dependent Variable at NUTS II Regions, 2000

Variables	Model 1	Model 2	Model 3	Model 4
(Constant)	(1.29)*	(3.53) ***	(2.47)**	(3.03) ***
AGE_14_64	-6.78*** (5.93)	-	1.76*** (6.73)	-
UNI_GRDTS	1.63** (2.67)	-	0.34 (0.73)	-
HGHSCH_GRDTS	-2.25 (0.70)	-	-0.99** (2.61)	-
FEMALE_TPOP	1.85 (0.55)	-	-0.46*** (3.57)	-
NET_MIGRATION	0.00 (1.62)	-	-0.27 (1.46)	-
AGE_20_40	6.98** (2.47)	-	-0.93*** (2.95)	-
ESTBSIZE	-	0.85 (1.51)	-	-0.38 (1.32)
SMEs_TF	-	-0.47** (2.16)	-	0.01 (0.05)
GDPpc	-	0.00 (0.30)	-	0.21 (1.00)
GDPpcGrthRt	-	3.39 (1.13)	-	-0.05 (0.38)
URBAN	-	-0.98 (1.06)	-	-0.37 (1.26)
POPDEN	-	-0.01 (0.13)	-	-0.12 (0.65)
EMP_AGRC	-	0.91 (0.36)	-	-3.41** (2.05)
EMP_SRVC	-	0.36 (0.33)	-	1.89** (1.84)
EMP_INDSTRY	-	-0.05 (0.05)	-	1.42* (1.63)
UNEMPL	-	2.95* (1.67)	-	-0.43** (1.89)
CHUNEMPL	-	3.22** (2.25)	-	0.18 (1.48)
BNKDEPSTpc	-	0.30** (2.03)	-	0.51 (0.27)
R Square	0.83	0.93	0.81	0.94
F-Value	15.66***	14.87***	13.63***	16.25***
N. of Obs.	26	26	26	26

Notes: * p < .05, ** p < .01, *** p < .001; absolute value of the t-statistics is in parentheses

In Model 4 self-employment rate (SLFEMP_LF) is regressed against several socio-economic variables. The results show that shares of employment in agricultural (EMP_AGRC), service (EMP_SRVC) and industrial (EMP_INDSTRY) sectors are statistically significant. While share of employment in service and industrial sectors have positive coefficient, share of employment in agricultural sector has negative coefficient. The results are not consistent with entrepreneurship literature which in general finds negative correlation between industrial sector and self-employment due to high costs of starting a new business in industrial sector. In addition, there is a negative and significant relationship between unemployment rate and self-employment rate, implying that when unemployment rate increases self-employment rate declines. The remaining variables are not statistically significant. Among them, establishment size (ESTBSIZE) has negative coefficient, while share of SMEs in total firms (SMEs_TF) is positively related to self-employment rate. This result supports the entrepreneurship literature and the thesis hypothesis which indicates that regions with lower share of large firms and higher share of small firms are expected to have higher self-employment rates. However, contrary to expectation, demand growth rate as measured GDP per capita growth rate (GDPpcGrthRt) has negative coefficient. Besides these, urbanization rate (URBAN) is negatively associated with self-employment rate. This is not consistent with the thesis hypothesis and entrepreneurship literature which shows that as urban provide more favourable conditions for entrepreneurial activity it is expected that regions with higher urbanization rate have higher self-employment rate. The result also suggests that as self-employment in Turkey mainly based on agricultural sector it is possible that rural regions have higher self-employment rate. Furthermore, there is negative relationship between agglomeration as measured population density (POPDEN) and self-employment rate. The result suggests that due to fierce competition, high costs of entry and less room for innovative-driven differentiation in densely populated areas, agglomerations may have negative effects on self-employment rate. Moreover, as expected, financial capital as measure bank deposit per capita (BNKDEPSTpc) have positive sign. This means that regions with higher levels of financial capital have higher estimated self-employment rates. Model 4 was significant ($p < 0.001$) and $R^2 = 0.94$, $F(12, 13) = 16.25$.

7.1.3. Main Findings for the period of 2011

The descriptive statistics of economic growth, entrepreneurship, demographic and socio-economic variables used in the analyses are presented in Table 7.17.

Table 7.17: Descriptive Statistics for NUTS II Regions. 2011

Variables	N	Minimum	Maximum	Mean	Std. Deviation
BIRTH_TF	26	0,007	0,025	0,012	0,005
BIRTH_LF	26	0,347	2,049	0,738	0,406
CHBIRTH	26	-0,013	0,093	0,053	0,028
DEATH_TF	26	0,001	0,008	0,003	0,002
DEATH_LF	26	0,057	0,674	0,187	0,129
SLFEMP_LF	26	69,749	217,617	122,387	34,060
ESTBSIZE	26	6,021	13,754	8,218	1,654
SMEs_TF	26	0,988	0,998	0,995	0,002
GDPvGrthRt	26	0,050	0,126	0,082	0,021
GDPpc	26	1468925	5748418	3322532	1241794
GDPpcGrthRt	26	0,043	0,131	0,078	0,023
lnGDPpc	26	417956	3091382	1540447	737883
AGE_14_64	26	0,565	0,717	0,663	0,045
URBAN	26	0,481	0,990	0,691	0,143
UNI_GRDTS	26	0,034	0,148	0,071	0,025
HGHSCH_GRDTS	26	0,086	0,212	0,150	0,033
FEMALE_TPOP	26	0,478	0,505	0,497	0,007
NET_MIGRATION	26	-60175	121782	0	32755
POPDEN	26	26,372	2622,063	192,015	499,928
AGE_20_40	26	0,277	0,371	0,320	0,020
EMP_AGRC	26	0,010	0,560	0,327	0,150
EMP_SRVC	26	0,310	0,720	0,444	0,101
EMP_INDSTR	26	0,120	0,430	0,232	0,087
EMPL_SMEs	26	0,628	0,948	0,819	0,085
CHEMPL	26	-0,038	0,018	-0,013	0,015
UNEMPL	26	0,050	0,172	0,103	0,035
CHUNEMPL	26	-0,081	0,054	-0,003	0,033
PATENTpc	26	0,000	15,891	3,587	4,201
INNvpc	26	9,157	440,575	93,653	89,633
CHINNvpc	26	0,114	0,249	0,169	0,040
INCTAX	26	0,276	42,744	3,846	8,195
CORPTAX	26	0,087	36,007	3,846	8,937
FRTRDZONE	26	0,000	4,000	0,808	0,981
TECHPARK	26	0,000	7,000	1,692	1,784
CRIME	26	0,000	0,002	0,001	0,000
BNKDEPSTpc	26	982	22884	5257	5398
Valid N (listwise)	26				

Table 7.18 indicates the results of Pearson correlation analysis which presents evidence about the relationship between variables. The results demonstrate that Gross Domestic Product per capita (GDPpc, which is used as a measure of economic development level, has positive and significant correlation with firm birth rate per total firms (BIRTH_TF) and per labour force (BIRTH_LF), firm death rate (DEATH_LF), labour force rate (AGE_14-64), human capital as measured by university graduate rate and high school graduate rate (UNI_GRDTS and HGHSCH_GRDTS), net migration (NET_MIGRATION), agglomeration as measured population density (POPDEN), patent per capita (PATENTpc), total innovations per capita (INNVpc), the numbers of techno park (TECHPARK), crime rate (CRIME), and financial capital (BNKDEPSTpc). Except the positive correlation with crime rate, the results are consistent with hypotheses and regional economic development literature. The positive correlation between crime rate and GDP per capita means that the nature of crimes reported do not have effect on people investment decision.

More interestingly, GDP value growth rate (GDPvGrthRt) and GDP per capita growth rate (GDPpcGrthRt) have only one correlation with entrepreneurship variables which is change in the firm birth rate (CHBIRTH). Both are negatively and significantly associated with CHBIRTH which means that those regions with higher firm birth growth rate are estimated to have lower economic growth rate in terms of GDP per capita growth rate and GDP value growth rate.

In addition, GDP per capita growth rate is negatively and significantly correlated with initial GDP per capita (InGDPpc) which is consistent with convergence theory. GDP per capita growth rate is also negatively and significantly associated with population density (POPDEN), patent per capita (PATENTpc), total innovations per capita (INNVpc), the numbers of techno park (TECHPARK), and financial capital (BNKDEPSTpc). These are not consistent with recent growth theories. As mentioned earlier, because of the government interventions such as incentives and direct supports, less developed regions in Turkey have experienced higher economic growth rate than developed regions, and therefore regions with lower innovative activities, human capital and financial capital have higher GDP per capita growth rate.

Table 7.18: Correlations Matrix among Variables of NUTS II Regions. 2011

Table 7.18: Correlations Matrix among Variables of NUTS II Regions, 2011																																					
Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
1 BIRTH_TF	1																																				
2 BIRTH_LF	.918**	1																																			
3 CHBIRTH	-.137	.084	1																																		
4 DEATH_TF	.482*	.629**	.034	1																																	
5 DEATH_LF	.552*	.768**	.136	.932**	1																																
6 SLEMP_LF	-.775**	-.612**	.162	-.134	-.184	1																															
7 ESTBSIZE	-.556**	-.742**	-.416*	-.363	-.497**	.452*	1																														
8 SMEs_TF	-.851**	-.855**	.023	-.618*	-.694**	.651**	.503**	1																													
9 GDP_GrGHIrt	.274	.051	-.578**	-.063	-.192	-.268	.311	-.019	1																												
10 GDPpc	.471*	.695**	.247	.694**	.895**	-.227	-.483*	-.688**	-.188	1																											
11 GDPpcGrGHIrt	-.166	-.364	-.526*	-.162	-.355	.198	.618*	.374	.811**	-.454*	1																										
12 logGDPpc	.411*	.634*	.284	.597**	.736**	-.247	-.534*	-.658**	-.413*	.935**	.704**	1																									
13 AGE_14_64	.156	.451*	.391*	.679**	.783**	.142	-.360	-.433*	-.457*	.861**	-.476*	.817**	1																								
14 URBAN	.812*	.854**	.112	.671**	.745**	-.646*	-.571**	-.880**	-.099	.666**	-.426*	.650**	.467*	1																							
15 UNLGRDITS	.508*	.703**	.105	.777**	.868**	-.189	-.469*	-.687**	-.159	.829**	-.350	.730**	.841**	.681**	1																						
16 HGHSCHGRDITS	.358	.558**	.253	.716**	.783**	-.034	-.351	-.569**	-.296	.856**	-.360	.775**	.922*	.595*	.900**	1																					
17 FEMALE_TPOP	.065	-.095	-.353	-.225	-.348	-.206	.251	.173	.718**	-.235	.454*	-.275	-.444*	-.243	-.354	-.349	1																				
18 NET_MIGRATION	.666*	.793**	.105	.671**	.799**	-.445*	-.547**	-.776**	.073	.778**	-.275	.688**	.560**	.716**	.694**	.601**	-.007	1																			
19 POPDEN	.663*	.740**	.089	.356	.533**	-.528*	-.648**	-.765**	-.121	.605**	-.579*	.676**	.369	.657**	.462*	.379	-.095	.674**	1																		
20 AGE_20_40	.805**	.779**	-.135	.587**	.597**	-.590**	-.316	-.784**	.322	.697**	-.105	.534**	.355	.697**	.528**	.494*	.309	.721**	.622**	.756**	.756**	1															
21 EMP_AGRIC	-.857**	-.947**	.023	-.407*	-.518*	.850**	.683**	.826**	-.065	-.623*	.440*	-.635**	-.287	-.928**	-.519**	-.424*	-.048	-.688**	-.780**	-.549**	-.723**	.789**	.501**	-.771**	.780**	1											
22 EMP_SRVC	.861**	.817**	.198	.335	.454*	-.779*	-.647**	-.678**	.169	.402*	-.246	.389*	.115	.656**	.515**	.289	.040	.590**	.602**	.595**	.613**	.759**	.264	1													
23 EMP_INDUSTRY	.472*	.512**	.280	.323	.379	-.549**	-.409*	-.636**	-.081	.615**	-.471*	.630**	.371	.664**	.307	.401*	.042	.542**	.658**	.613**	.759**	.264	1														
24 CHEMPL	.655*	.785**	.137	.647**	.744**	-.396*	-.520*	-.810**	-.177	.795**	-.574*	.828**	.642*	.783**	.717**	.675**	-.169	.717**	.816**	.677**	.736**	.519**	.672**	1													
25 EMP_L_SMEs	-.623*	-.701**	-.206	-.392*	-.638**	.505*	.446*	.771**	.181	-.842**	.427*	-.806*	.645*	.758**	-.728**	-.761**	.071	-.668**	-.549**	-.723**	.789**	.501**	-.771**	.780**	1												
26 UNEMPL	.562*	.424*	-.295	.114	.075	-.518**	-.255	-.370	.243	.010	-.142	.119	-.231	.383	-.028	-.078	.415*	.144	.478*	.501**	.531**	.444*	.402*	.399*	-.255	1											
27 CHUNEMPL	.135	.311	.172	.387	.406*	.041	-.366	-.230	.216	.520**	-.457*	.618*	.488*	.228	.357	.417*	.106	.302	.388	.341	-.289	.044	.455	.587**	-.516**	.461*	1										
28 PATENTpc	.444*	.657**	.526**	.555*	.698**	-.241	-.595**	-.667**	-.388	.838**	-.564*	.806*	.778**	.735**	.706**	.751**	-.400*	.646*	.535*	.502**	.601**	.306	.677**	.674**	-.786**	-.031	.371	1									
29 INNVpc	.594*	.811**	.412*	.664**	.829**	-.315	-.752*	.727**	-.342	.769**	-.573*	.735**	.720**	.835**	.756**	.708**	-.410*	.738**	.644**	.540**	.655**	.430**	.613**	.756**	-.700**	.145	.396*	.891**	1								
30 CHINNVpc	.245	.074	-.150	-.488*	-.419*	.234	-.102	.083	.223	-.372	.033	-.288	-.517**	.217	-.423*	-.450*	.354	-.183	.089	.078	-.061	.267	-.220	-.138	.247	.441*	-.017	-.374	-.307	1							
31 INCTAX	.608*	.817**	.295	.681**	.842**	-.325	-.675**	-.811**	-.255	.808**	-.553*	.798*	.710**	.788**	.771**	.688**	-.331	.779**	.783**	.598**	.649**	.475*	.590**	.842**	-.658**	.133	.338	.807**	.908**	-.269	1						
32 CORPTAX	.733*	.881**	.174	.668**	.807**	-.461*	-.683**	-.896**	-.108	.786**	-.505*	.771*	.821**	.864**	.803**	.677**	-.288	.774**	.760**	.655**	.749**	.615**	.383**	.829**	-.747**	.237	.341	.817**	.901**	-.206	.945**	1					
33 RPTROZONE	.311	.403	.040	.313	.387*	-.154	-.339	-.284	.000	.370	-.136	.355	.257	.460**	.233	.343	.019	.305	.346	.326	.354	.180	.409	.388*	-.317	.307	.235	.335	.446*	-.123	.426*	.405*	1				
34 TECHPARK	.533*	.655**	.375	.443*	.572**	-.282	-.518**	.677**	-.225	.596**	-.433*	.594*	.524*	.706**	.606**	.588**	-.159	.544**	.498**	.559**	-.516**	.368	.463*	.590**	-.588**	.087	.148	.711**	.745**	-.138	.763**	.767**	.446*	1			
35 CRIME	-.122	.228	.417*	.342	.479**	.225	-.403*	.029	-.434*	.493*	-.466*	.545**	.658**	.130	.462*	.445*	-.182	.201	.112	.021	-.048	.017	.076	.319	-.225	-.166	.512**	.413*	.480*	-.278	.405*	-.278	.234	.248	1		
36 BNKDEPSpc	.485*	.728**	.227	.816**	.934**	-.143	-.549**	.705**	-.297	.865**	-.474	.809*	.878**	.678**	.933**	.863**	-.419*	.786**	.594**	.529**	-.525**	.437*	.409*	.789**	-.700**	-.001	.474*	.764**	.837**	-.411*	.867**	.838**	.264	.567**	.502**	1	
** Correlation is significant at the 0.01 level (2-tailed).																																					

*. Correlation is significant at the 0.05 level (2-tailed).

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

In terms of entrepreneurship variables, firm birth per labour force (BIRTH_LF) is significantly and positively correlated with demand as measured GDP per capita, labour force (AGE_14-64), urbanization rate (URBAN), human capital (UNI_GRDTS and HGHSCH_GRDTS), net migration (NET_MIGRATION), and financial capital (BNKDEPSTpc). The results support thesis hypotheses and entrepreneurship literature.

7.1.3.1. The contribution of entrepreneurship on regional economic development and economic growth, NUTS II Regions, 2011

This sub-section aims to provide empirical results about the first research question that examines the impact of entrepreneurship on regional economic development and growth. In this sense, three different analyses were conducted. As done in 1990 and 2000 the study used Gross Domestic Product per capita (GDPpc) (2011) as measure of the level of economic development, while used growth in value of GDP (2000-2011) and growth in per capita GDP (2000-2011) as the measure of regional economic growth, respectively, and regressed against entrepreneurship variables and other demographic and socio-economic variables.

The level of economic development (GDP per capita) and entrepreneurship variables

In this context, the results of the GDP per capita models for NUTS II regions for the year 2011 are presented in Table 7.19. The GDP per capita level is estimated against entrepreneurship variables; firm birth rate per total firms (BIRTH_TF), firm birth rate per 1000 people in labour force (BIRTH_LF), change in firm birth rate per 1000 people in labour force (CHBIRTH), firm death rate (DEATH_LF), self-employment rate (SLFEMP_LF), establishment size per regions (ESTSIZE), and share of SMEs in total firms (SMEs_TF); and other socio-economic variables human capital (UNI_GRDTS and HGHSCH_GRDTS), labour force (AGE_14-64), net migration (NET_MIGRATION), unemployment rate (UNEMPL), patent per capita (PATENTpc), numbers of techno parks (TECHPARK), crime rate (CRIME), and financial capital represented as bank deposit per capita (BNKDEPSTpc). The goodness of fit (R^2) of the empirical results ranges from 69 to 97 percent in GDP per capita level. Table 7.19 presents the results of eight regression models.

In the first model, Model 1, GDP per capita is estimated as a function of entrepreneurship variables. Among entrepreneurship variables, only firm death rate has significant relationship with GDP per capita. As observed, firm death rate (DEATH_LF) is positively and significantly related with economic development (GDPpc). As mentioned early, this can be explained with Schumpeter's creative-destruction theory, indicating that regions with higher firm birth rate and firm death rate have higher economic development levels. Similar to previous models, firm birth rate per total firms (BIRTH_TF) has negative coefficient, whereas firm birth rate per labour force (BIRTH_LF) has positive coefficient. This suggests that in Turkey context, regions with higher firm birth rate per labour force have higher estimated GDP per capita levels than regions with higher firm birth rate per total firms. Growth in firm birth rate (CHBIRTH) is not significant but it has positive sign, as expected. Model 1 was significant ($p < 0.001$) with $R^2 = 0.69$, $F(4, 21) = 11.74$.

Second model, Model 2, added self-employment rate (SLFEMP_LF), which is the other measure of entrepreneurship used in this study, to model 1. The results show that firm birth rate per total firms (BIRTH_TF), firm birth rate per labour force (BIRTH_LF), firm death rate (DEATH_LF), and growth in firm birth rate (CHBIRTH) have same relationships with GDP per capita as in Model 1. However, self-employment rate (SLFEMP_LF) does not have significant relation with GDP per capita level, and contrary to expectation, it has negative coefficient which shows that since the majority of self-employment in Turkey are necessity-driven and non-innovative, they have limited contribution on regional economic development level, and therefore regions with higher self-employment may have lower levels of economic development. Model 2 was also significant ($p < 0.001$) with $R^2 = 0.70$, $F(5, 20) = 9.40$.

Model 3 includes labour force (AGE_14-64) variable as well as entrepreneurial variables. The results demonstrate that as expected labour force (AGE_14-64) is positively and significantly associated with the level of GDP per capita. The result is consistent with neo-classical perspective and expectations. This suggests that the existence of a pooled labour market in an area positively affects its GDP per capita. All entrepreneurship variables are found to be statistically insignificant. Firm birth rate per labour force has positive signs while the remaining entrepreneurship variables have

negative signs. Model 3 was also significant ($p < 0.001$) and entrepreneurship variables and labour force explained an essential part of variation of GDPpc $R^2 = 0.88$, $F(6, 19) = 23.37$.

Model 4 added human capital variables as measured university graduate rate and high school graduate rate (UNI_GRDTS and HGHSCH_GRDTS), to model 2. The results show that although it is highly emphasized in human capital theory, university graduate rate (UNI_GRDTS) is not significant and even has negative coefficient. On the other hand, high school graduate rate (HGHSCH_GRDTS) is positive and significant. The results suggest that regions with lower university graduate rate and higher high school graduate rate are predicted to have higher GDP per capita. As mentioned above, because the majority of university graduates have propensity to be salaried-employment rather than self-employment and have lower salaried job opportunities, a large part of them faced with unemployment problem and have limited contribution on economic development. Therefore, regions with higher university graduates have lower estimated economic development level. Among entrepreneurship variables, firm birth rate per labour force (BIRTH_LF) has positive and significant relation with GDP per capita, whereas firm birth rate per total firms (BIRTH_TF) and self-employment rate (SLFEMP_LF) has negative and significant influence. This result is similar to previous results. The model was significant and explains 85% of variation in GDP per capita, and $F(7, 18) = 14.13$, $p < .001$.

In model 5, the thesis added financial capital as measured bank deposit per capita (BNKDEPSTpc) to model 2. GDP per capita level is positively and significantly associated with bank deposit per capita, as expected. This means that an increase in bank deposit per capita leads to an increase in GDP per capita level. No entrepreneurship variables are significant in this model. As expected, firm birth rate per labour force (BIRTH_LF) and growth in firm birth rate (CHBIRTH) have positive coefficients and the remaining have negative coefficients. The model was significant ($p < 0.001$) with $R^2 = 0.77$, $F(6, 19) = 10.57$.

Table 7.19: Regression Results Using GDP per Capita as Dependent Variable (NUTS II, 2011)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Constant	(0.06)	(0.03)	(1.82)*	(1.09)	(1.09)	(0.12)	(1.17)	(0.73)
BIRTH_TF	-0.41 (0.86)	-0.63 (1.15)	-0.09 (0.24)	-0.89** (2.05)	-0.32 (0.64)	-0.46 (1.08)	-0.40* (0.51)	-
BIRTH_LF	0.66 (1.10)	0.71 (1.17)	0.32 (0.81)	1.00** (2.04)	0.33 (0.58)	0.43 (0.88)	0.62*** (0.73)	0.01* (0.03)
CHBIRTH	0.07 (0.43)	0.05 (0.36)	-0.09 (0.84)	-0.10 (0.74)	0.03 (0.21)	-0.23 (1.58)	-0.21 (1.54)	-
DEATH_LF	0.52** (2.07)	0.57** (2.19)	-0.12 (0.58)	0.10 (0.42)	-0.05 (0.14)	0.28 (1.30)	-0.06 (0.21)	0.11 (0.48)
SLFEMP_LF	-	-0.18 (0.84)	-0.23 (1.64)	-0.30* (1.74)	-0.17 (0.89)	-0.07 (0.42)	-0.24 (1.26)	0.30** (2.66)
ESTBSIZE	-	-	-	-	-	-	-	0.25 (1.43)
SMEs_TF	-	-	-	-	-	-	-	-0.17 (0.66)
AGE_14_64	-	-	0.89*** (5.34)	-	-	-	0.88 (1.36)	-0.51 (0.76)
UNI_GRDTS	-	-	-	-0.27 (0.89)	-	-	-0.26 (0.75)	0.20 (0.72)
HGHSCH_GRDTS	-	-	-	0.80*** (3.18)	-	-	0.10 (0.24)	0.72** (1.89)
NET_MIGRATION	-	-	-	-	-	-	-	0.40** (3.04)
POPDEN	-	-	-	-	-	-	-	0.42** (2.34)
UNEMPL	-	-	-	-	-	-	-	-0.27* (2.05)
PATENTpc	-	-	-	-	-	0.67*** (3.60)	0.20 (0.76)	0.35* (1.79)
TECHPARK	-	-	-	-	-	-	-	-0.24** (2.21)
CRIME	-	-	-	-	-	-	-0.09 (0.31)	0.39** (2.22)
BNKDEPSTpc	-	-	-	-	0.79** (2.36)	-	-0.04 (0.08)	-0.55 (1.15)
R Square	0.69	0.70	0.88	0.85	0.77	0.82	0.90	0.97
F-Value	11.74** *	9.40***	23.37** *	14.13** *	10.57** *	14.68** *	11.52** *	18.44** *
N. of Obs.	26	26	26	26	26	26	26	26

Notes: * p < .10, ** p < .05, *** p < .01; absolute value of the t-statistics is in parentheses

Model 6 added patent per capita (PATENTpc) to model 2. As can be seen, patent per capita has positively and significantly associated with the level of GDP per capita, as expected. The result is consistent with recent growth theories and expectation. The remaining variables are not significant. Among them, only firm birth rate per labour force (BIRTH_LF) has expected sign. Model 6 was significant ($p < 0.001$) and $R^2 = 0.82$, $F(6, 19) = 14.68$.

In model 7 GDP per capita was estimated against all these variables. Firm birth rate per total firms (BIRTH_TF) has a negative and significant relationship with GDPpc level, whereas firm birth rate per labour force (BIRTH_LF) has positive and significant relation with GDP per capita. This result is observed several times in previous models and implies that regions with lower firm birth rate per total firms (based on Ecological Approach) and higher firm birth rate per labour force (Labour Market Approach) are predicted to have higher economic development level (GDPpc). The other entrepreneurship variables do not have significant effects in determining GDP per capita level. In addition, although the socio-economic variables used in this model were highly emphasized in recent models, no one has significant impact on regional economic development level as observed. However, as expected labour force (AGE_14-64), patent per capita (PATENTpc), and high school graduate rate (HGHSCH_GRDTS) have positive signs. Contrary to expectation, university graduate rate (UNI_GRDTS) and financial capital as measured bank deposit per capita (BNKDEPSTpc) has negative coefficient. In addition, crime rate is also not significant and as expected it has negative effect on the level of GDP per capita. Model 7 was significant ($p < 0.001$) and $R^2 = 0.90$, $F(11, 14) = 11.52$.

In the last model, Model 8, the study added seven other socio-economic variables and excluded firm birth rate per total firms (BIRTH_TF) and change in firm birth rate labour force (CHBIRTH) to Model 7. The results demonstrate that GDP per capita has positive and significant relationship with firm birth rate per labour force (BIRTH_LF) and self-employment rate (SLFEMP_LF), as expected. In addition, although it is not significant, firm death rate has also positive coefficient. These suggest that regions with higher entrepreneurial activity are predicted to have higher economic development levels (GDPpc). The result is consistent with entrepreneurship literature and thesis hypotheses.

As expected, high school graduate rate (HGHSCH_GRDTS) has positively and significantly associated with GDP per capita level. University graduate rate is not significant, but it has positive coefficient as expected. This suggests that an increase in human capital increases GDP per capita level in the NUTS II regions. The coefficient of agglomeration as represented by population density (POPDEN) is also positive and significant. The result is consistent with cluster and new industrial district theory, indicating that regions with higher population density have higher estimated GDP per capita. As can be seen, net migration (NET_MIGRATION) is positively and significantly related with GDP per capita. This means that regions with higher economic development levels have higher migration rate than regions with lower economic development. The negative and significant relationship between unemployment rate (UNEMPL) and GDP per capita is consistent with expectation. As high rate of unemployment may result in deprived economy, it has negative effect on GDP per capita. The relationship between patent per capita (PATENTpc) and economic development (GDPpc) is positive and significant that supports the arguments of recent growth theories such as innovative milieu, regional innovation system, and national innovation system. On the other hand, there is a negative and significant association between the numbers of techno parks (TECHPARK) and GDP per capita, contrary to expectation. More interestingly, the impact of crime rate (CRIME) on regional economic development is positive and significant. This suggests that the nature of crimes reported do not have substantial effect on individuals' investment decisions and therefore a positive relation can be observed between the level of GDPpc and CRIME. The remaining variables are not statistically significant. While establishment size has positive coefficient, share of SMEs in total firms (SMEs_TF) has negative coefficient, implying that region with relatively higher numbers of large firms have higher GDP per capita level than regions with higher numbers of SMEs. Although this is not consistent with general entrepreneurship literature, many empirical findings indicate that in the context of developing countries regions with larger firms have higher economic development levels. Financial capital (BNKDEPSTpc) is also not significant but it has unexpected sign. Model 8 was significant ($p < 0.001$) and all variables explained a significant

proportion of variation of the level of economic development (GDPpc) $R^2 = 0.97$, $F(15, 10) = 18.44$.

The level of economic growth (measured by growth in GDP value) and entrepreneurship variables

As indicated in Table 7.20, GDP value growth rate (GDPvGrthRt) was used as a measure of economic growth levels of regions and estimated as a function of entrepreneurship variables – firm birth rate per 1000 people in labour force (BIRTH_LF), change in firm birth rate per 1000 people in labour force (CHBIRTH), firm death rate (DEATH_LF), self-employment rate (SLFEMP_LF), establishment size per regions (ESTSIZE), share of SMEs in total firms (SMEs_TF); and a set of additional socio-economic variables human capital (UNI_GRDTS and HGHSCH_GRDTS), labour force (AGE_14-64), net migration (NET_MIGRATION), agglomeration as measured population density (POPDEN), unemployment rate (UNEMPL), change in innovation growth rate (CHINNVpc), and financial capital represented as bank deposit per capita (BNKDEPSTpc). The goodness of fit (R^2) of the empirical results ranges from 43 to 82 percent in GDP value growth rate. Table 7.20 presents the results of three regression models.

In the first model, Model 1, GDP value growth rate is estimated as function entrepreneurship variables. The results show that GDP value growth rate (GDPvGrthRt) is negatively and significantly associated with change in firm birth rate (CHBIRTH). The result does not support the thesis hypothesis and means that regions with higher firm birth growth rate has lower estimated GDP value growth rate. The other entrepreneurship variables are not statistically significant. However, all of them have expected sign. This implies that regions with higher self-employment rate and firm birth rate for the year 2000 are expected to have higher economic growth rate (GDPvGrthRt). The model was significant ($p < 0.001$) and explains 43% of variation in GDP value growth rate with a computed $F(4, 21) = 4.02$.

Table 7.20: Regression Results Using GDP Value Growth Rate as Dependent Variable (NUTS II, 2011)

Variables	Model 1	Model 2	Model 3
Constant	0.07 (0.74)	-7.13*** (2.97)	-7.12* (1.95)
BIRTH_LF	0.05 (1.27)	0.19*** (4.31)	0.20*** (3.42)
CHBIRTH	-0.42*** (3.26)	-0.22* (1.95)	-0.25 (1.58)
DEATH_LF	-0.04 (1.58)	-0.11*** (3.12)	0.13** (2.53)
SLFEMP_LF	0.01 (0.14)	0.02 (0.56)	0.02 (0.35)
ESTBSIZE	-	0.22*** (3.89)	0.22** (2.66)
SMEs_TF	-	7.12*** (2.96)	7.02* (1.92)
AGE_14_64	-	-0.14 (1.20)	-0.15 (0.52)
UNI_GRDTS	-	-	-0.24 (0.48)
HGHSCH_GRDTS	-	-	0.48 (0.15)
NET_MIGRATION	-	0.00*** (3.22)	0.00** (2.44)
POPDEN	-	-	-0.01 (0.66)
UNEMPL	-	0.03 (0.34)	0.03 (0.25)
CHINNVpc	-	-0.25** (2.43)	-0.25* (2.10)
BNKDEPSTpc	-	-	0.03 (0.63)
R Square	0.43	0.81	0.82
F-Value	4.02***	6.50***	3.66***
N. of Obs.	26	26	26

Notes: * p < .10, ** p < .05, *** p < .01; absolute value of the t-statistics is in parentheses

The second model, Model 2, regressed GDP value growth rate (GDPvGrthRt) against entrepreneurship variables and several socio-economic variables highly used in previous empirical studies. The results indicate that there is positive and significant relationship between firm birth rate per labour force (BIRTH_LF) and the level of economic growth (GDP value growth rate). Conversely, change in firm birth rate (CHBIRTH) has a negative and significant relation with the level of economic growth (GDPvGrthRt). As expected, firm death rate (DEATH_LF) has negative and significant coefficient. More

interestingly, establishment size (ESTBSIZE) and share of SMEs in total firm (SMEs_TF) have positive and significant effect on GDP value growth rate at the same time. This indicates that those regions with high numbers of large firms and SMEs are predicted to have higher level of economic growth (GDP value growth). Furthermore, net migration (NET_MIGRATION) is positively and significantly related to GDPvGrthRt, meaning that regions with higher migration rate have higher economic growth rate. Change in innovation per capita (CHINNVpc) is found to be statistically significant and negative. This is not consistent with recent regional growth theories and expectation. The remaining variables are not significant. Contrary to expectation, while labour force rate (AGE_14-64) has negative coefficient, unemployment rate (UNEMPL) has positive sign. These imply that regions with higher innovation growth rate and labour force rate are estimated to have lower economic growth rate. As mentioned above and observed in previous models, during the period of 2000 to 2011 less developed regions in Turkey experienced higher economic growth rate than developed regions, and therefore, although developed regions have higher innovative activities and labour force due to other growth factors have lower level of economic growth. The independent variables explain 81% of variation in the level of economic growth as measured by GDP value growth rate, and $F(10, 15) = 6.50, p < .001$.

The last model, Model 3, estimated GDP value growth rate as a function of entrepreneurship variables and a set of socio-economic variables. In terms of entrepreneurship variables firm birth rate per labour force (BIRTH_LF) and firm death rate (DEATH_LF) are positively and significantly associated with GDP value growth rate. This is consistent with Schumpeter creative-destruction theory indicating that new firms generate new combinations in the market that result in firm death, and therefore, regions with higher entrepreneurial activity (firm death and birth) are predicted to have higher GDP value growth rate. The remaining entrepreneurship variables are not significant and have same relationships as in previous models. Similarly, the impacts of establishment size (ESTBSIZE), share of SMEs in total firm (SMEs_TF), labour force rate (AGE_14-64), net migration (NET_MIGRATION), unemployment rate (UNEMPL), and change in innovation per capita (CHINNVpc) are same as to the second model. The remaining variables are not statistically significant. As the human

capital variables university graduate rate (UNI_GRDTS) has negative coefficient, whereas high school graduate rate (HGHSCH_GRDTS) has positive sign. This suggests that regions with higher high school graduate rate have higher GDP value growth rate than region with higher university graduate rate. Moreover, as a representative of agglomeration population density (POPDEN) is not significant and has negative coefficient contrary to expectation. Although financial capital represented as bank deposit per capita (BNKDEPSTpc) is not significant is has positive sign, as expected. These shows that regions with lower population density and higher bank deposit per capita have higher level of economic growth (GDPvGrthRt). The model was significant ($p < 0.01$) and all variables explained an important proportion of variation of GDP value growth rate (GDPvGrthRt) $R^2 = 0.82$, $F(14, 11) = 3.66$.

The level of economic growth (measured by growth in GDP per capita) and entrepreneurship variables

Table 7.21 demonstrate the results of economic growth level which was measures as GDP per capita growth equation for NUTS II regions for the periods of 2000-2011. GDP per capita growth rate is regressed against entrepreneurship variables and a set of socio-economic variables. The goodness of fit (R^2) of the empirical results varies from 44 to 83 percent in the level of economic growth (GDP per capita growth rate).

Model 1 estimated GDP per capita growth rate (GDPpcGrthRt) against entrepreneurship variables. Similar to GDP value growth rate, GDP per capita growth rate has negative and significant relationship with change in firm birth rate (CHBIRTH), referring that regions with higher firm birth growth rate (CHBIRTH) has lower estimated GDP per capita growth rate. As expected, firm death rate (DEATH_LF) has negative and significant influence on GDP per capita growth. Although firm birth rate per labour force (BIRTH_LF) and self-employment rate (SLFEMP_LF) are not statistically significant both have positive coefficient as expected. All this implies that regions with higher entrepreneurial activity (in 2000) have higher estimated economic growth rate (GDP per capita growth rate) for the periods of 2000-2011. Model 1 was significant ($p < 0.001$) with $R^2 = 0.44$, $F(4, 21) = 4.15$.

Table 7.21: Regression Results Using GDP per Capita Growth Rate as Dependent Variable (NUTS II, 2011)

Variables	Model 1	Model 2	Model 3
Constant	-0.01 (0.16)	-3.07* (1.05)	-3.40* (0.86)
BIRTH_LF	0.06 (1.04)	0.07* (1.69)	0.15** (2.36)
CHBIRTH	-0.43*** (2.94)	-0.22 (1.42)	-0.31* (1.85)
DEATH_LF	-0.04* (1.75)	0.00 (0.43)	-0.06 (1.04)
SLFEMP_LF	0.09 (1.67)	-0.01 (0.24)	0.01 (0.26)
lnGDPpc	-	-0.00*** (2.93)	-0.00** (2.26)
ESTBSIZE	-	0.16** (2.10)	0.16** (1.82)
SMEs_TF	-	3.02 (1.01)	3.26 (0.83)
AGE_14_64	-	0.13 (0.39)	0.13 (0.37)
UNI_GRDTS	-	-0.14 (0.37)	-0.48 (0.94)
HGHSCH_GRDTS	-	0.22 (0.73)	0.20 (0.63)
POPDEN	-	-	-0.01 (0.75)
CHINNVpc	-	-	-0.21* (1.68)
BNKDEPSTpc	-	-	0.02 (0.37)
R Square	0.44	0.79	0.83
F-Value	4.15***	5.60***	4.65***
N. of Obs.	26	26	26

Notes: * p < .10, ** p < .05, *** p < .01; absolute value of the t-statistics is in parentheses

Model 2 contains both socio-economic and entrepreneurship variables. In terms of entrepreneurship variables, only firm birth rate per labour force (BIRTH_LF) is statistically significant. As observed, it has positive and significant relation with GDP per capita growth rate. The remaining entrepreneurship variables are not significant. Contrary to expectation, change in firm birth rate (CHBIRTH) and self-employment rate (SLFEMP_LF) has negative coefficient, while firm death rate (DEATH_LF) has positive coefficient. In addition, the negative and significant relationship between initial

GDP per capita (InGDPpc) and GDP per capita growth rate is consistent with convergence hypothesis. The relationship between establishment size (ESTSIZE) and GDP per capita growth rate is also positive and significant ($\beta = .16$, $p < .01$), indicating that regions with relatively higher numbers of large firms have higher estimated economic growth rate. The remaining variables are not statistically significant. Except university graduate rate (UNI_GRDTS), high school graduate rate, labour force (AGE_14-64), and share of SMEs in total firm (SMEs_TF) have positive relationships with the level of economic growth (GDP per capita growth rate). The results are consistent with expectation and recent growth theories. Model 2 was significant ($p < 0.001$) and explains 79% of variation in GDP per capita growth rate with a computed $F(10, 15) = 5.60$.

Model 3 added agglomerations as measured population density (POPDEN), growth in innovation (CHINNVpc), and financial capital as represented by bank deposit per capita (BNKDEPSTpc) to Model 2. The results indicate that among entrepreneurship variables firm birth per labour force (BIRTH_LF) has positive and significant relationship with GDP per capita growth rate. In contrast, there is a negative and significant association between growth in firm birth rate and economic growth rate. This result is not consistent with the thesis hypothesis which expected that those regions with higher growth rate in new business formation have higher estimated economic growth rate. The other entrepreneurship variables are not statistically significant, but both self-employment rate (SLFEMP_LF) and firm death rate (DEATH_LF) have expected signs. Similar to the second model, initial GDP per capita (InGDPpc) is significantly and negatively related with GDP per capita growth rate, which is consistent with convergence theory. In addition, share of SMEs in total firm (SMEs_TF), establishment size (ESTSIZE), labour force (AGE_14-64), university graduate rate (UNI_GRDTS), and high school graduate rate (HGHSCH_GRDTS) have the same effects on GDP per capita growth rate as in the second model. Contrary to expectation, growth in innovation (CHINNVpc) is negatively and significantly related to GDP per capita growth rate and agglomeration as measured population density (POPDEN) has negative but insignificant relation with economic growth rate. These mean that regions with higher innovative activities and higher agglomeration rates are predicted to have lower economic growth rate. Moreover,

although financial capital as represented by bank deposit per capita (BNKDEPSTpc) has negative relationship with GDP per capita growth rate it has expected coefficient. The model was significant ($p < 0.01$) and all variables explained an important proportion of variation of GDP per capita growth rate (GDPpcGrthRt) $R^2 = 0.83$, $F(13, 12) = 4.65$.

7.1.3.2. The relationship between entrepreneurship and economic development stages of NUTS II Regions, 2011

The empirical results regarding the second research question are demonstrated in this sub-section. The research question aims to investigate the links between economic development level and regional entrepreneurship. The study was conducted at NUTS II regional level and for the period of 2011. The main expectation is that regions with low and high economic development level have higher firm birth rate per labour force (BIRTH_LF) and self-employment rate (SLFEMP_LF) than regions at the middle stage of economic development. As indicated above a U-shaped relationship between regional entrepreneurship levels and regional economic development stages is expected. To explore these relations one-way ANOVA is used.

Table 7.22: ANOVA Results of BIRTH_LF at NUTS II Regions, 2011

	Groups	N	Mean	SD	F	<i>p</i>
GDPpc	High	6	1.201	0.553	7.929	0.002
	Low	5	0.553	0.144		
	Medium	15	0.615	0.244		
	Total	26	0.738	0.406		

Firm birth rate per labour force (BIRTH_LF) is the first variable used as dependent variables against three development categories. As indicated in table 7.22 regions at high economic development level ($M = 1.201$, $SD = 0.55$) have higher level of new business formation rate (BIRTH_LF) than region at medium ($M = 0.615$, $SD = 0.24$) and low ($M = 0.553$, $SD = 0.14$) economic development level. The result is partly consistent with entrepreneurship literature and thesis hypothesis because it is expected that regions at low economic development level should have higher firm birth rate than regions at high

economic development level. Contrary to expectation, regions at low economic development also have lower firm birth rate than regions at medium economic development. The possible reasons behind these results can be that as mentioned earlier, regions with high economic development have more favourable conditions for new business formation and thus they have higher firm formation rate. On the other hand, since regions at early stage of economic development have many unregistered firm birth rate, they have low numbers of formal firm births. Although one-way ANOVA results found the difference between mean scores of these groups statistically significant $F_{2,23} = 7.93$; $P < .01$), the results do not support the thesis hypothesis.

Self-employment rate per 1000 people in labour force (SLFEMP_LF) is the second variable used as dependent variables against economic development levels. Table 7.23 shows that regions at the middle (medium) stage of economic development ($M = 141.17$, $SD = 25.68$) have higher self-employment rate (SLFEMP_LF) than regions at the early (low) ($M = 101.31$, $SD = 34.95$) and advanced (high) stage of economic development ($M = 93.18$, $SD = 21.43$). The results are not consistent with entrepreneurship literature and thesis main expectation. As indicated above as regions at low economic development level have less job opportunities, many people start to their own businesses (being self-employment) to escape unemployment, and thus it was expected that those regions at the low economic development level should have higher self-employment than regions at medium and high economic development levels. ANOVA results found the difference between mean scores of these categories statistically significant $F_{2, 23} = 8.82$; $P < .001$). However, the results do not support the literature and thesis hypothesis.

Table 7.23: ANOVA Results of SLFEMP_LF at NUTS II Regions, 2011

	Groups	N	Mean	SD	F	<i>p</i>
GDPpc	High	6	93.184	21.431	8.821	0.001
	Low	5	101.306	34.949		
	Medium	15	141.096	25.676		
	Total	26	122.387	34.060		

7.1.3.3. The effects of certain regional characteristics on entrepreneurship at NUTS II Regions, 2011

The main aim of this sub-section is to present empirical results about the third research question, which aims to explore the influences of demographic, socio-economic, cultural and institutional characteristics of regions on regional entrepreneurship for NUTS II regions for the year 2011. Two different measures of entrepreneurship were used in this study. At first, firm birth per 1000 people in the labour force (BIRTH_LF) was used as the first dependent variable against certain characteristics of the regions and the first two models (Model 1 and 2) were constructed based on this variable. Secondly, self-employment per 1000 people in labour force (SLFEMP_LF) was used as the other dependent variables against regional characteristics and the later two models (Model 3 and 4) were based on this variable.

In this context, Model 1 estimated firm birth rate (BIRTH_LF) as a function of demographic variables which are labour force rate (AGE_14_64), human capital measured as university graduate rate and high-school graduate rate (UNI_GRDTS and HGHSCH_GRDTS), share of female in total population (FEMALE_TPOP), net migration rate (NET_MIGRATION), and share of people between 20-40 years (AGE_20_40). The goodness of fit (R^2) of the two empirical results varies from 82 to 95 percent in firm birth rate (BIRTH_LF).

As indicated in Table 7.24 firm birth rate (BIRTH_LF) is positively and significantly associated with university graduate rate (UNI_GRDTS), as expected. This result supports thesis hypothesis and entrepreneurship literature. The result suggests that especially because of the spillover of knowledge, higher level of innovation and creativity, and sophisticated social and professional networks, which enhance the recognition, generation, and exploitation of new entrepreneurial opportunities, regions with higher university graduate rate are predicted to have higher firm birth rate. A negative and significant relationship between share of female in total population (FEMALE_TPOP) and firm birth rate is also consistent with entrepreneurship literature. As mentioned above and hypothesized, due to having less financial capital, work experience and difficulties in accessing loans, female have lower intentions to start a

business, and therefore, regions with higher female population is expected to have lower firm birth rate. On the other hand, net migration (NET_MIGRATION) has positive and significant effect on firm birth rate, as hypothesized. Since the majority of immigrants have higher tendency to start a new business regions with higher immigrant population are estimated to have higher firm birth rate. Similarly, share of population 20 to 40 years (AGE_20_40) is positively and significantly related with firm birth rate, as expected. The results implies that because people generally establish new businesses in their thirties regions with higher share of people between age 20-40 have higher estimated firm birth rate. The remaining variables are not statistically significant. Labour force rate (AGE_14_64) and high-school graduate rates (HGHSCH_GRDTS) are not significant and have unexpected coefficients. Model 1 was significant ($p < 0.001$) and demographic variables explained a significant proportion of variation of BIRTH_LF $R^2 = 0.82$, $F(6, 19) = 14.96$.

Model 2 estimated firm birth rate (BIRTH_LF) against a set of socio-economic variables; establishment size (ESTBSIZE), share of SMEs in total firms, growth in demand level as measured GDP per capita growth rate (GDPpcGrthRt), rate of urbanization (URBAN), population density (POPDEN), share of employment in service (EMP_SRVC) and industrial (EMP_INDSTRY) sectors, share of employment in SMEs (EMPL_SMEs), rate of unemployment (UNEMPL), and financial capital measured as bank deposit per capita (BNKDEPSTpc).

The results demonstrate that establishment size (ESTBSIZE) has negative and significant relationship with firm birth rate, as expected. This means that regions with higher numbers of large firm have lower estimated firm birth rate. However, contrary to expectation, share of small and medium enterprises is negatively related to firm birth rate. This is not consistent with the thesis hypothesis implying that regions with higher share of SMEs are expected to have higher levels of new business formation. As hypothesized, demand as measured GDP per capita growth rate (GDPpcGrthRt) is positively and significantly associated with firm birth rate. As higher income levels are strongly linked to a greater demand for new and differentiated products and services, it can generate more business opportunities and lead to higher levels of new firm formation in a region. Therefore, regions with higher GDP per capita levels have higher

estimated firm birth rate. The results also indicate that rate of urbanization (URBAN) has positive and significant relation with firm birth rate. The result is consistent with expectations and entrepreneurship literature which indicates that as urban areas provide various economic advantages and more convenient incubation conditions regions with higher urbanization rate have higher firm birth rate. As observed, share of employment in industrial (EMP_INDSTRY) sector is negatively and significantly linked to firm birth rate. This is consistent with hypothesis, and implies that regions with higher share of industrial sector have lower firm birth rate. The remaining variables do not have statistically significant effects on new firm formation rate. As hypothesized, agglomeration as represented by population density (POPDEN), share of employment in service sector (EMP_SRVC), and financial capital measured as bank deposit per capita (BNKDEPSTpc) have positive coefficient. However, contrary to expectation, share of employment in SMEs (EMPL_SMEs) has negative coefficient. Although rate of unemployment (UNEMPL) has positive coefficient, this result is consistent with entrepreneurship literature. This implies that as unemployment rates rise, individual with low wage-employment alternatives may be pushed into self-employment that results in positive relationship between unemployment and entrepreneurship. Thus, regions with higher unemployment rate are predicted to have higher firm birth rate. Model 2 was significant ($p < 0.001$) and explains 95% of variation in firm birth rate with a computed $F(10, 15) = 27.07$.

The following two models are based on self-employment per 1000 people in labour force (SLFEMP_LF). The goodness of fit (R^2) of the empirical results ranges from 61 to 93 percent in self-employment rate.

In Model 3 self-employment rate (SLFEMP_LF) is regressed against several demographic variables such as labour force rate, human capital, share of female in total population, net migration, and the share of population between 20 to 40 years. The results indicate that rate of labour force (AGE_14-64) has positive and significant relationship with self-employment rate. This is consistent with literature and expectations. The result implies that regions with higher labour force rate are predicted to have higher self-employment rate. On the contrary, share of people between 20-40 years (AGE_20_40) is negatively and significantly associated with self-employment

rate. This result is not consistent with expectation and empirical literature. The remaining variables are not statistically significant. Contrary to expectation, university graduate rate (UNI_GRDTS) and high-school graduate rate (HGHSCH_GRDTS) are not significant and both have negative coefficients. This means that regions with higher university graduates and high school graduates have lower self-employment rates. On the other hand, share of female in total population (FEMALE_TPOP) is also not significant but it has positive sign. Moreover, net migration (NET_MIGRATION) does not have statistically significant relation with self-employment rate, yet it has expected sign. Model 3 was significant ($p < 0.001$) and demographic variables explained 0.61 (R^2) the variation in self-employment rate and $F(6, 19) = 4.99$.

Model 4 contains socio-economic variables such as establishment size, share of SMEs in total firms, demand level as represented by GDP per capita level, rate of urbanization, population density, share of employment in service and industrial sectors, share of employment in SMEs, rate of unemployment, and financial capital measured as bank deposit per capita. The results show that establishment size (ESTBSIZE) has negative and significant relation with self-employment rate. This suggests that regions dominated by large firms, as expected, have lower estimated self-employment rate. Agglomerations as represented by population density (POPDEN) are also positively and significantly associated with self-employment rate. This result support the thesis hypothesis indicating that due to advanced business infrastructure and market proximity, regions with high population density can support the growth of entrepreneurial activity. On the other hand, there is a negative and significant relationship between share of employment in service (EMP_SRVC) sector and self-employment rate. This means that regions with higher share of service sector are predicted to have lower self-employment rate. This is not consistent with entrepreneurship literature pointing out that as compared to manufacturing sector, the costs of starting new businesses is mostly lower in service sector and thus regions with higher share of service sector are expected to have higher self-employment rate. However, the negative and significant relationship between share of employment in industrial sector (EMP_INDSTRY) and self-employment (SLFEMP_LF) supports the above argument.

Table 7.24: Regression Results Using Firm Birth (BIRTH_LF) and Self-employment (SLFEMP_LF) in Total Labour Force as Dependent Variable at NUTS II Regions, 2011

Variables	Model 1	Model 2	Model 3	Model 4
(Constant)	-2.47** (2.09)	14.33 (0.86)	2.01* (2.03)	-20.06** (1.80)
AGE_14_64	-1.35 (1.01)	-	2.71** (2.43)	-
UNI_GRDTS	4.95** (2.29)	-	-1.95 (1.08)	-
HGHSCH_GRDTS	-1.52 (0.69)	-	-0.30 (0.16)	-
FEMALE_TPOP	-0.48* (1.89)	-	0.23 (1.06)	-
NET_MIGRATION	0.00* (1.29)	-	0.00 (0.89)	-
AGE_20_40	6.83*** (3.25)	-	-3.67** (2.09)	-
ESTBSIZE	-	-1.11*** (3.36)	-	-0.27** (1.25)
SMEs_TF	-	-13.94 (0.83)	-	23.40 (2.10)
GDPpcGrthRt	-	2.30*** (2.62)	-	0.66 (1.13)
URBAN	-	0.50** (1.91)	-	0.11 (0.61)
POPDEN	-	0.09 (1.10)	-	0.12** (2.29)
EMP_SRVC	-	0.69 (0.19)	-	-1.33*** (5.67)
EMP_INDSTRY	-	-0.72* (1.34)	-	-1.34*** (3.77)
EMPL_SMEs	-	-0.66 (1.20)	-	-0.79*** (2.16)
UNEMPL	-	0.69 (1.28)	-	0.18 (0.52)
BNKDEPSTpc	-	0.06 (0.57)	-	0.09 (1.25)
R Square	0.82	0.95	0.61	0.93
F-Value	14.96***	27.07***	4.99***	18.89***
N. of Obs.	26	26	26	26

Notes: * p < .05, ** p < .01, *** p < .001; absolute value of the t-statistics is in parentheses

The results also show that contrary to expectation share of employment in SMEs (EMPL_SMEs) has negative and significant link with self-employment rate. This means that regions with higher share of SMEs sector have lower estimated self-employment

rates. This is not consistent with entrepreneurship literature and the thesis hypothesis indicating that working in a small firms/business may allow individuals to improve their entrepreneurial capability that enhances the probability of the employees of these businesses to become self-employment. The remaining socio-economic variables are not statistically significant. As the measures of demand GDP per capita has positive coefficient, which is consistent with literature. In addition, as expected share of SMEs in total firms (SMEs_TF), rate of urbanization (URBAN), and financial capital measured as bank deposit per capita (BNKDEPSTpc) are not individually significant, but all have positive signs. These results suggest that regions with higher shares of SMEs, higher rates of urbanization, and higher levels of financial capital are predicted to have higher self-employment rate. The model was significant ($p < 0.001$) and explained 93% of variation in self-employment rate with a computed $F(10, 15) = 18.89$.

7.2. Summary of Empirical Findings

The purpose of this section is to summarize the findings stem from the empirical analyzes of the thesis hypotheses. In the first sub-section, the empirical findings regarding the main contributions of the entrepreneurship on regional economic development and growth for the periods of 1990, 2000, and 2011 will be summarized. In the second sub-section, the empirical evidence on the links between the economic development stages of the regions and the levels of regional entrepreneurial activity will be discussed. In the last sub-section, the empirical results of the effects of certain regional characteristics on regional entrepreneurial activity for the respective three periods will be provided.

7.2.1. The Contribution of Entrepreneurship on Regional Economic Development and Economic Growth

To explore the contribution of entrepreneurship on regional economic development and economic growth, the study constructs three different models for three different periods (1987-1990, 1990-2000; and 2000-2011) at NUTS II regional level. The study firstly examines the impact of entrepreneurship on the level of economic development which is measured as GDP per capita level. To investigate the effect of entrepreneurship on economic growth, the study uses growth in GDP value and growth in GDP per capita as measure of economic growth. It is widely recognized that entrepreneurship is a key source of the generation of new jobs, creation of employment, innovations and dissemination of new knowledge which ultimately lead to economic development and growth. Therefore, the thesis expects that entrepreneurship has positive effect on regional economic development and economic growth.

The level of economic development (GDP per capita) and entrepreneurship variables

The regional economic development level (measured as GDP per capita) equations for the years of 1990, 2000, and 2011 are estimated using multiple regression analysis. The GDP per capita growth equations are regressed against entrepreneurship variables and a set of socio-economic variables. The results of these three models generally support the

main hypothesis of the thesis, indicating evidence on the positive associations between entrepreneurial variables and the level of economic development (GDP per capita). In addition, the evidence on the effects of socio-economic variables on economic development demonstrates that the results of these three models are highly consistent with arguments in economic development literature. The results of these three equations are presented in Table 7.25.

The results indicate that as the commonly used measure of entrepreneurship, firm birth rate per labour force has positive and significant relationship with economic development level. This result supports the thesis hypothesis and the empirical studies (Audretsch and Thurik, 2001; Tang and Koveos, 2004) in entrepreneurship literature. This means that regions with higher firm birth rate (per labour force) are predicted to have higher economic development level. However, the effects of the other commonly used entrepreneurship variables, self-employment, are mixed. While self-employment rate has a negative effect on economic development in 1990, its effects for the years 2000 and 2011 are positive. As indicated in literature, as compared to self-employment which captures only Knightian (taking risk) entrepreneurship, new firm formation are more entrepreneurial (Acs and Armington, 2003; Mueller, 2007; Acs and Mueller, 2007) because it captures Kirznerian (exploiting profitable opportunities), Knightian (taking risk), and Schumpeterian (exploiting innovation) entrepreneurship. Thus, firm birth per labour force has more pronounced effect on the level of economic development. The negative coefficient of growth in firm birth rate implies that regions with higher firm birth growth rate have lower levels of economic development. The result is not consistent with expectation and the possible reason behind this result is that the majority of firms entering to the market during this period (1987-1990) were non-innovative and necessity-driven. Firm death rate is also negatively related to GDP per capita level showing that regions with higher firm death rate have lower economic development level. The relationship between the establishment size and GDP per capita level is also complicated. While they have positive relationships in 1990, have negative relations in 2000. Decentralization of large firms in 1990s from developed regions toward less developed regions may explain this result. The rate of labour force is positively associated with GDP per capita level, as expected. This result is consistent with neo-

classical perspective, meaning that the presence of labour force in a region positively affects economic development level of respective region. The results also indicate that contrary to expectation, university graduate rate has negative influence on the level of economic development. This result is not consistent with human capital theory and implying that university graduates do not play a crucial role in determining regional economic development level. On the other hand, high school graduate rate has positively and significantly associated with GDP per capita level that means that regions with higher skilled labour force rate have higher economic development levels. The results also demonstrate that net migration and agglomeration as measured population density have positive influences on the level of economic development, as expected. The result is consistent with cluster and new industrial district theory, indicating that regions with higher population density have higher estimated GDP per capita. Also, the result shows that regions with higher net migration rates have higher economic development levels. Unemployment variables have also positive relations with GDP per capita. This can be explained with mass migrations which lead to an increase in unemployment especially in developed regions. As a measure of innovation, patent per capita is positively associated with GDP per capita. This is consistent with innovative milieu and regional innovation system theories and implying that regions with higher patent per capita have higher estimated economic development levels. Moreover, as indicated in table the relationship between bank deposit per capita and GDP per capita is positive and significant, as expected. This means that those regions with higher levels of financial capital are predicted to have higher economic development levels (GDPpc). This result is consistent with expectation and previous empirical evidence. Interestingly, the relationship between the numbers of techno parks and GDP per capita is negative, whereas crime rate has positive relation with economic development level. This suggests that the nature of crimes reported do not have substantial effect on individuals' investment decisions, and therefore, a positive relation can be observed between the level of GDPpc and crime rate.

Table 7.25: The level of economic development (as measured GDP per capita) and entrepreneurship variables

Using GDP per Capita in Models With Full Data			
Variables	1990	2000	2011
BIRTH_TF			
BIRTH_LF	+	+	+
CHBIRTH	-		
DEATH_LF		-	
SLFEMP_LF	-	+	+
ESTBSIZE	+	-	
SMEs_TF			
AGE_14_64	+	+	
UNI_GRDTS	-	-	
HGHSCH_GRDTS	+		+
NET_MIGRATION			+
POPDEN	+		+
CHUNEMPL	+		
UNEMPL		+	-
PATENTpc		+	+
FRTRDZONE			
TECHPARK			-
CRIME			+
BNKDEPSTpc		+	

The level of economic growth (measured by growth in GDP value) and entrepreneurship variables

The results of economic growth (as measured growth in GDP value) equations are consistent with thesis hypothesis indicating that entrepreneurship is positively associated with regional economic growth rate. As demonstrated in Table 7.26, the relationship between new firm formation and economic growth rate is positive and significant. Similarly, growth rate in firm birth rate has positive impact on GDP value growth rate. It is also observed that firm death rate both has positive and negative associations with economic growth rate. These results are consistent with Schumpeter creative-destruction theory indicating that as new firms create new combinations in the market existing technologies and products become obsolete that increases firm death rate, and therefore,

regions with higher turbulence (birth and death of firms) have higher economic growth rate.

The establishment size and share of SMEs are positively related to GDP value growth rate. The results imply that regions with higher numbers of large firms and higher share of SMEs have higher levels of economic growth. In addition, the positive and significant impact of labour force on GDP value growth rate is consistent with neoclassical growth models and implying that regions with higher labour force have higher economic growth rate. Among human capital variables only university graduate rate has statistically significant effect on regional economic growth rate. However, as indicated in table, it has positive relationship with economic growth for the period of 1987-1990, while has negative relation for the period of 1990-2000. In addition, although it does not have significant effect for the period of 2000-2011, university graduate rate has negative effect on GDP value growth rate. These results are not consistent with human capital theory and imply that although the rate of university graduate has increased in many regions in Turkey, due to the inadequate and inappropriate job opportunities many university graduates are being unemployed in recent years. Therefore, regions with higher university graduate rates have lower economic growth rate. On the other hand, the other human capital variable, high-school graduate rate does not have significant effect on GDP value growth rate. Net migration generally has positive and negative effect on economic growth rate. However, the negative and significant relationship between agglomerations as measured population density and GDP value growth rate is not consistent with clusters and new industrial district theories indicating that regions with higher agglomeration rate are expected to have higher economic growth rate. In addition, the results show that growth in employment rate have positive and significant impact on GDP value growth rate. This suggests that regions with increasing employment experience increasing economic growth. Contrary to expectation, innovation, as measured patent per capita and growth in the number of innovation applications, has negatively associated with economic growth rate. These results are not consistent with recent growth theories namely innovative milieu, regional innovation system, and national innovation system and imply that regions with higher innovative activities have lower economic growth rate. Moreover, the influence of financial capital,

as represented by bank deposit per capita, on economic growth rate is negative. Especially, the results of economic growth equation for the period of 1990-2000 do not support previous growth theories. The reason behind these results can be that less developed regions have experienced higher economic growth (GDP value growth rate) during this period, and therefore, the results are not consistent with previous empirical studies.

Table 7.26: The level of economic growth (measured by growth in GDP value) and entrepreneurship variables

Using GDP Value Growth Rate in Models With Full Data			
Variables	1987-1990	1990-2000	2000-2011
BIRTH_TF			
BIRTH_LF		+	+
CHBIRTH	+		
DEATH_LF		-	+
SLFEMP_LF			
ESTBSIZE			+
SMEs_TF			+
AGE_14_64		+	
UNI_GRDTS	+	-	
HGHSCH_GRDTS			
NET_MIGRATION	+	-	+
POPDEN		-	
CHEMPL	+	+	
CHUNEMPL			
UNEMPL			
PATENTpc		-	
CHINNVpc			-
BNKDEPSTpc		-	

The level of economic growth (measured by growth in GDP per capita) and entrepreneurship variables

The results of second economic growth equation, which used GDP per capita growth rate as a measure of economic growth, indicate that entrepreneurship variables have positive and significant relationships with economic growth (Table 7.27). This results support the main hypothesis of the thesis. In terms of entrepreneurship variables firm birth per labour force and growth in firm birth rate are found to have positive influences

in determining increases in regions economy. However, firm birth rate per total firms has negative effect on regional economic development. As mentioned above, using Ecological Approach, which use total firm numbers as denominator, for the normalization of firm birth rate has been criticized by many researchers (Garofoli, 1994; Audretsch and Fritsch, 1994) indicating that ecological approach results in measurement biases by overstating firm birth rates in regions which have larger number of small firms and by underestimating the firm birth rates in regions where large firms are dominated (Gaygısız and Köksal, 2003). Therefore, the effect of firm birth per labour force (Labour Market Approach) on economic growth and development can be different from firm birth per total firm. The results also indicate that establishment size and share of SMEs in total firm has positive effect on regional economic growth rate. This result was also observed in the other economic growth equation. Initial condition as measured initial GDP per capita is negatively related to economic growth rate (GDP per capita growth rate). This is consistent with convergence hypothesis (Barro and Sala-i-Martin, 1991, 1999; Tansel and Güngör, 1998). Similar to previous models labour force rate has positive association with economic growth rate. This is consistent with previous empirical studies indicating that labour force has positively affects regional economic growth. As observed above, university graduate rate is negatively related to economic growth rate. On the other hand, the other human capital variable as represented high-school graduate rate both has positive and negative relationship with GDP per capita growth. These results demonstrate that human capital variables do not have significant impact in determining the increase in regional economic growth, contrary to expectation and human capital theory. Similarly, population density has positive relationship for the period of 1987-1990, but it has negative relation for the period of 1990-2000. In addition, the relationship between net migration and GDP per capita growth rate is positive. This suggests that regions with higher economic growth rate have higher net migration rate. The negative coefficient of agglomeration variable is not consistent with argument in cluster and industrial district theory. Furthermore, an increasing unemployment rate has negative effect on GDP per capita growth rate. This is consistent with expectation and implies that regions with higher unemployment growth rate have lower estimated economic growth rate. Moreover, growth in innovation, the numbers of

free trade zone and bank deposit per capita have positively associated with economic growth rate. Contrary to the previous economic growth equation, which used GDP value growth rate as measure of economic growth, innovative activities and financial capital have positive effects on GDP per capita growth rate in these models. This implies that regions have higher economic growth in terms of GDP value growth rate are different from those regions with higher GDP per capita growth rate.

Table 7.27: The level of economic growth (measured by growth in GDP per Capita) and entrepreneurship variables

Using GDP per Capita Growth Rate in Models With Full Data			
Variables	1987-1990	1990-2000	2000-2011
BIRTH_TF		-	
BIRTH_LF		+	+
CHBIRTH			-
DEATH_LF			
SLFEMP_LF	+	+	
ESTBSIZE		+	
SMEs_TF			+
lnGDPpc			-
AGE_14_64		+	
UNI_GRDTS	-		
HGHSCH_GRDTS	+	-	
NET_MIGRATION			+
POPDEN	+	-	
CHEMPL			
CHUNEMPL		-	
CHINNVpc		+	-
FRTRDZONE		+	
BNKDEPSTpc		+	

7.1.2. The Relationship between Entrepreneurship and Economic Development Stages of NUTS II Regions

The thesis investigates the relationship between the levels of entrepreneurship and economic development stages of NUTS II regions for the years 1990, 2000, and 2011. Two measures of entrepreneurship, firm birth rate and self-employment rate, are used in one-way ANOVA analyses for three different periods. The results show that a U-shaped relationship between the levels entrepreneurial activities and economic development levels of regions is determined while using firm birth rate as measure of entrepreneurship. This result is consistent with thesis hypothesis and entrepreneurial literature as indicated above. On the other hand, contrary to expectation, the study found an inverse U-shaped relationship between economic development level and self-employment rate. This result is not consistent with entrepreneurship literature expecting that due to increasing real wages and the opportunity costs of starting new businesses, the returns of wage-workers will be higher than self-employment in regions at the middle stage of economic development, and therefore, many individuals would trying to move from self-employment to wage employment. The reason behind this result can be that contrary to developed countries, in Turkey as a developing country, regions at the middle stage of economic development have higher levels of economic activities in agricultural sector and thus higher rate of self-employment.

The results show that using firm birth rate as measure of entrepreneurial activity provides more consistent results with entrepreneurship literature and main expectations of the thesis.

7.1.3. The Effects of Certain Regional Characteristics on Regional Entrepreneurial Activity

The third and last aim of the thesis is to explore the impacts of demographic and socio-economic factors of regions on entrepreneurial activity. Similar to above models, firm birth rate and self-employment rate are used as the proxies of entrepreneurship. The study used multiple linear regression analysis for the NUTS II regions of Turkey for the periods of 1990, 2000, and 2011. The general conclusion of the models is that regional

characteristics have significant effects on entrepreneurship variables and the results are generally consistent with hypothesis and entrepreneurship literature.

Firstly, firm birth rate was estimated as a function of demographic and socio-economic variables. The results show that labour force is negatively associated with firm birth rate. The result is not consistent with entrepreneurship literature which indicates that regions with higher pooled labour market attract individuals having entrepreneurial intentions to start new businesses. In terms of human capital variables university graduate rate has positive and significant relationship with new business formation. This suggest that regions with higher human capital are predicted to have higher new business formation rate. The results are consistent with the studies (Maskell and Malmberg, 1999; Davidsson and Honig, 2003; Renko et al., 2012; Keen and Etemad, 2012; Urbano and Turró, 2013) indicating that through generating new knowledge and innovations which generate new business opportunities, university graduates has positive impact on entrepreneurial activity. However, high-school graduate rate is negatively and significantly associated with firm birth rate. This is not consistent with entrepreneurship literature indicating that regions with a pooled skilled labour force are more attractive for entrepreneurial activity. The negative and significant relationship between the share of female population and firm birth rate implies that since women have lower accessibility to resources, work experience, and tendency to launch new businesses, regions with higher share of female population have lower estimated entrepreneurial activity. Share of people between 20-40 years is positively related to firm birth rate. This result is also consistent with hypothesis and literature. Empirical studies (Storey, 1994; Welter and Rosenblatt, 1999; Reynolds et al. 2003; Bergmann, 2011) show that the entrepreneurial tendency rise with age and roughly between ages of 20-40 reaches its peak. The positive and significant relationship between firm birth rate and net migration implies that regions with higher share of immigrant population which have higher tendency to start new businesses are predicted to have higher firm birth rate. On the other hand, the establishment size has negative relation with firm birth rate that supports the main argument in entrepreneurship literature which indicates that regions dominated by larger firms have lower entrepreneurial activity. As expected, increasing in demand level, represented by growth in GDP per capita, and urbanization

rate have positive associations with firm birth rate. As higher wealth and income level leads to greater demand for new goods and services, more capacity of spending, and greater supply of inputs, regions with higher income levels (or demand) have higher new firm formation rates (Shane, 1993; Reynolds, Storey, and Westhead, 1994; Bergmann, 2005). Similarly, due to supplying more convenient incubation conditions than rural areas, regions with higher urbanization rate have higher firm formation rate (Nijkamp, 2009; Fritsch and Schroeter, 2011, Kibler, 2013). The results also indicate that, share of manufacturing sector has negative relation with firm formation rate, as expected. As indicated earlier, due to requiring more financial capital and other resources, manufacturing sector has negative effect on regional entrepreneurial activity. Moreover, unemployment rate (UNEMPL) has both positive and negative association with firm birth rate. This is consistent with hypothesis and literature, referring that because unemployed people do not have enough wage-employment options they have to start new businesses and therefore there is positive relationship between firm birth rate and unemployment rate. On the other hand, an increase in unemployment leads to a decrease in demand for new goods and services, and that result in a decline in the rate of new firm formation. The results also demonstrate that financial capital measured as bank deposit per capita have positive and significant effect on new businesses formation as expected.

Secondly, self-employment rate is regressed against demographic and socio-economic variables. The results show that labour force is positively and significantly associated with self-employment rate. This means that regions with higher rates of labour force are predicted to have higher self-employment rate. Similar to above, share of female population is negatively related to self-employment rate. In addition, the impact of establishment size on self-employment rate is negative, as expected. Contrary to expectation, high-school graduate rate and share of population between 20-40 years are negatively correlated with self-employment rate. Demand as represented GDP per capita has positive effect on self-employment rate. This support the thesis hypothesis and entrepreneurship literature. However, agglomeration as measured population density has positively associated with self-employment rate. This implies that due to advanced business infrastructure, market proximity, a pooled labour market, and higher innovative

activities regions with high population density can support the growth of entrepreneurial activity. As expected, share of service sector have positive influences on self-employment rate, but share of agriculture and industrial sectors have both positive and negative effects. Although share of SMEs in total firms which represent entrepreneurial culture have highly emphasized in entrepreneurial literature, it does not have statistically significant effect on firm birth rate and self-employment rate. Similarly, financial capital as measured bank deposit per capita also does not have statistically significant influence on self-employment rate. However, both variables have positive coefficients.

Table 7.28: The effects of certain regional characteristics on entrepreneurship in terms of firm birth rate and self-employment rate

Variables	Using Firm Birth Rate in Models			Using Self-employment Rate in Models		
	1990	2000	2011	1990	2000	2011
AGE_14_64	-	-	-	+	+	+
UNI_GRDTS	+	+	+			
HGHSCH_GRDTS	-				-	
FEMALE_TPOP	-		-	-	-	
NET_MIGRATION	+	+	+			
AGE_20_40			+	-	-	-
ESTBSIZE	-		-			-
SMEs_TF		-				
GDPpc						+
GDPpcGrthRt			+			
URBAN	+		+			
POPDEN	+					+
EMP_AGRC				+	-	
EMP_SRVC				+	+	
EMP_INDSTRY	-		-	-	+	-
EMPL_SMEs						-
UNEMPL		+	-	-	-	
CHUNEMPL		+				
FRTRDZONE						
BNKDEPSTpc		+				

CHAPTER 8

CONCLUSION

8.1. Conclusion

Entrepreneurship as a source of technological changes, innovations, new knowledge, employment generation, and eventually economic growth and development, has attracted attention of sheer number of researchers and policy makers since the 1970s crisis. However, before the 1970s, due to economies of scale and comparative advantages, the size of production units was a matter of great importance, and thus, large firms were recognized and used as the main investment vehicles. Large firms began to become dominant in the innovative and production activities and the share of them had increased almost in all industries and economies. On the other hand, the emphasis put into the entrepreneurial activities was at the lowest level during this period. Carlsson et al. (2013) indicated that a large part of the 20th century can be defined as a period of accumulation. Wennekers et al. (2010) point out that the period illustrates the features of the Schumpeter Mark II regime in which large firms outperform smaller firms and being the pioneers of technological developments. Similarly, Audretsch and Thurik (2001) describe this period as the period of the ‘managed economy’ in which economic, social, and political decisions were taken based on the directives of large firms.

After the 1970s crisis times began to change and fundamental developments in economic environment took place, and that led to serious changes in the economic growth discourses and approaches. This crisis has been recognized as a significant breaking point by the researchers and scientists in the context of economic growth theories. In other words, the 1970s crisis led to the questioning of and the recognition of the weaknesses of the Fordist type production that triggered the emergence of a new industrial order and a transition from mass production towards flexible production

system. The emergence of economic collapse especially in regions dominated by large firms created a great disappointment on growth discourses established on economies of scale, state intervention, return to scale, and expansion of market share. Therefore, after the crisis economies of scale lost its importance and large firms were found slow and inflexible to adapt to new market circumstances and they faced with serious economic difficulties. On the other hand, flexible production and specialization have been considered as a way of achieving territorial economic development and competitiveness. Therefore, during this period, share of small and medium enterprises (SMEs) has begun to increase in most of developed countries, and researchers found that small firms outperform larger firms in terms of employment growth, technological progress and economic growth. Within this framework, especially after the 1970s crisis entrepreneurial activities have been recognized as the key drivers of (regional) employment generation and economic development. In this respect, Carree et al. (2002) described this period as a transition from a Schumpeterian Mark II type regime towards a Schumpeterian Mark I type of regime. Similarly, Audretsch and Thurik (2001) asserted that a shift from the type of 'managed economy' towards that of the 'entrepreneurial economy' has been experienced in modern economies between the mid-1970s and the early 1990s.

In particular, after the 1990s, globalization and the revolution in information and communication technologies (ICT) have further increased the importance of small and innovative firms in economic development process. In addition, the empirical studies conducted, after this period, proved that small and medium sized enterprises are important vehicles for creating new jobs and employment generation, and thus the interest in SMEs and entrepreneurship has substantially increased. In that sense, entrepreneurship, as a source of (regional) economic development and creation of new jobs, has been widely accepted as a new solution against unemployment problem in various countries. Therefore, in recent years, many governments have begun to devote a significant amount of their resources and given priority in their policies to enhance entrepreneurial activity in their countries.

As a result, especially towards the end of 1980s, new firm formation and entrepreneurship have been new phenomena in regional science and economic development theory as well as in various different policy documents. Ultimately, the mainstream of the entrepreneurship literature has pointed out that entrepreneurship play a significant role in the process of economic development and growth in terms of employment, innovation, competitiveness, and knowledge spillover.

Within this framework, the main aim of this thesis is to examine the relationship between entrepreneurship and regional economic development and growth in the context of NUTS II regions of Turkey for the periods of 1990, 2000, and 2011. To obtain this objective, the thesis examined the following three research questions.

Firstly, how does entrepreneurship contribute to regional economic development? The thesis firstly aims to find out the contribution of entrepreneurship on regional economic development and economic growth, by using economic growth models and employing multiple linear regression analysis. The thesis constructed three functions to estimate the contribution of entrepreneurship on regional economic development and growth. The regional economic development is measured by GDP per capita, while growths in GDP value and in GDP per capita are used as proxies of regional economic growth, and estimated as a function of entrepreneurship variables and a set of socio-economic variables. The empirical estimations regarding the contribution of entrepreneurship on regional economic development and growth show that entrepreneurship, as measured firm birth rate and self-employment rate, is a significant driver of economic development and economic growth. However, it is noteworthy that new firm formation has more pronounced positive effect on regional economic development and growth than self-employment. This may result from the types of self-employment which are mainly non-innovative, necessity-driven and based on agriculture sector in NUTS II regions of Turkey. In other words, as compared to self-employment which captures only Knightian (taking risk) entrepreneurship, new firm formation are more entrepreneurial (Acs and Armington, 2003; Mueller, 2007; Acs and Mueller, 2007) because it captures Kirznerian (exploiting profitable opportunities), Knightian (taking risk), and Schumpeterian (exploiting innovation) entrepreneurship. Thus, new firm formation has stronger effect on economic development and growth than self-employment in the

context of Turkish regions. In addition, the results provide evidence that labour force, human capital, financial capital, and innovative activities play key roles in the economic development and growth processes. However, as compared the first economic growth equation represented by growth in GDP value, socio-economic variables have more positive and significant effects on economic development (GDP per capita) and on the second economic growth equation as measured growth in GDP per capita. The results are generally consistent with recent endogenous growth theories and models such as new industrial district, innovative milieu, regional innovation system, and human capital theories/models.

Secondly, why do the effects of entrepreneurship on regional economic development differ across regions? The second aim of this thesis is to investigate the reasons behind diverse impacts of entrepreneurship on regional economic development. According to the literature, due to two main reasons, the contribution of entrepreneurship on economic development may differ across regions (Reynolds et al., 1994; Carree et al., 2002; Acs and Armington, 2004; Wennekers et al., 2005; Stam, 2006; Gries and Naudé, 2008; Fritsch and Mueller, 2004, 2008; Acs and Mueller, 2008). Firstly, researchers have indicated that entrepreneurs with different types and characteristics have diverse effects on economic growth (i.e., while innovative, productive, knowledge-based, and/or opportunity driven entrepreneur may have substantially positive effects on regional economic development, non-innovative, unproductive, and necessity-driven entrepreneurs may have insignificant or even negative influences (Baumol, 1990; Acs and Varga, 2005; Gries and Naude', 2010)). Secondly, the economic development stages of regions (factor-driven, efficiency-driven, and innovation-driven stages) are seen the other important factor in the regional differences in the effect of entrepreneurship on economic development (Wennekers et al., 2005; Acs, Desai and Hessels, 2008). The previous empirical studies show that entrepreneurship has positive relationship with economic development in regions at the advanced stage of development, whereas it is negatively related to economic development in regions at the early stage of economic development (van Stel et al., 2005; van Stel, 2009). In other words, it is argued that regions at the early stage of economic development have higher levels of entrepreneurial activities, but they are mainly necessity-driven, non-innovative, unproductive, and

informal. Conversely, regions at the middle stage economic development have higher numbers of large firms, and thus lower levels of entrepreneurial activities. On the other hand, as technological advancements reduce the opportunity costs of starting new businesses and eliminate the advantage of economies of scale, regions at the innovation-driven stage have higher numbers of entrepreneurship which are mainly innovative, knowledge-based, and opportunity-driven. Therefore, a U-shaped relationship between entrepreneurial activity and the economic development levels of regions is expected. Using one-way ANOVA, the study examined the links between the economic development stages of regions and the levels of regional entrepreneurial activity at NUTS II regions of Turkey. In this respect, the study constructed two models for three different periods 1990, 2000, and 2011. In the first model, the thesis used the rate of new firm formation, measured as the number of new firm births per 1000 people in the labour force (BIRTH_LF), as a measure of entrepreneurship to explore the relationship between the economic development stages of regions (NUTS II regions) and level of regional entrepreneurial activity. In the second model, the thesis used self-employment rate per 1000 people in labour force (SLFEMP_LF) as a measure of entrepreneurship. The empirical findings on the relationship between the level of entrepreneurship and the stages of economic development demonstrated that there is a U-shaped relationship between firm birth rate and regional economic development level. This result is consistent with entrepreneurship literature and the thesis hypothesis. However, the findings also show that there is an inverse U-shaped relationship between self-employment rate and the levels of regional economic development. This result does not support the thesis hypothesis.

Lastly, what are the impacts of certain regional characteristics on regional entrepreneurship? The study investigates the influences of regional demographic, economic, cultural and institutional factors on the regional entrepreneurial activity in terms of new firm formation and self-employment, by using multiple linear regression analysis. All these analyses are conducted for three different periods: 1990, 2000; and 2011. The general conclusion of these empirical models is that regional characteristics have crucial effects on regional entrepreneurial activity and the results are generally consistent with entrepreneurship literature and support the thesis hypothesis. In other

words, the results support the arguments that regional characteristics have substantial effects on individuals' decisions to be self-employment and to start new businesses. In Turkish regions context, share of university graduates, share of immigrants, demand rate, rate of urbanization, population density, and financial capital play key roles in determining the levels of regional new firm formations. On the other hand, rate of labour force, demand rate, and share of service sector are the more pronounced determinants of self-employment rate. However, although share of SMEs in total firms which represent entrepreneurial culture have highly emphasized in entrepreneurial literature, it does not have statistically significant effect on firm birth rate and self-employment rate. The results also demonstrate that the factors that have effects on the two entrepreneurship variables are different from each other. This implies that regions with higher firm birth rate have different characteristics from those regions with higher self-employment rate.

To sum up, this thesis provides empirical supports to existing theories of economic growth and development, and entrepreneurship literature. In other words, the study provides empirical evidence from the relation of entrepreneurship and regional economic development in three different aspects. Namely, it firstly provides evidence on the contribution of entrepreneurship on regional economic development and growth, and then it investigates the reasons behind the diverse effects of entrepreneurship, and finally providing evidence on the impacts of entrepreneurship determinants.

8.1.1. Policy Recommendations

Based on the empirical results of the thesis, the following recommendations may help policy makers to achieve economic development and growth and to eliminate the disparities between regions of Turkey.

- The empirical results confirms that entrepreneurship play a vital role in economic development and growth process. New firm formation and self-employment are positively related to regional economic development/growth from 1990 to 2011. Entrepreneurship, as a source of new jobs creation, should be encouraged to struggle more effectively with unemployment problem. Therefore, policy makers should create more convenient conditions to generate an entrepreneurial environment in their regions.

- The findings also show that firm death rate has significant and negative impact on economic growth and development. Policy makers should support the existing entrepreneurial activities and prevent firm deaths. Providing financial support and education programs may help entrepreneurs to learn how to survive in today's competitive market environment and how to enlarge their businesses.
- The positive and significant relationships between regional economic development and human capital, innovative activities, labour force, and financial capital can be a good clue for policy makers and politicians about how to achieve economic development and to reduce regional inequalities. Increasing the quality of labour force and human capital, supporting innovative activities and providing financial capital is expected to facilitate and accelerate economic growth.
- The thesis also provides evidence on the impacts of certain regional characteristics on entrepreneurial activities. The results indicate that policy makers need to create favourable conditions to keep their regions attractive for entrepreneurial activities.
- Positive and significant effects of university graduates and high-school graduates on new venture creation imply that in order to increase the rate of skilled labour force policy makers need to pay great attention to education and educated people.
- The positive impacts that migration has on new business formation suggest that policy makers need to create conditions to attract (especially educated) immigrants to come to their regions and launch new businesses.
- The findings also demonstrate that increasing GDP per capita and decreasing unemployment has positively associated with new firm formation which imply that policy maker should continue support the development policies. In addition, the findings suggest that prior entrepreneurial activity and presence of financial capital have positively related to new firm formation. In that sense, policy makers need to support small and medium enterprises and to establish financial support system entrepreneurs.

To sum up, the thesis provides empirical evidence and significant implications for policy makers to achieve regional economic development and growth, and to create more

convenient incumbent conditions for making their regions more attractive for entrepreneurial activities.

8.1.2. Limitation of the Study

The lack of data on some key indicators has been the most important limitation of this study. To obtain a better understanding on the relationship between entrepreneurship and regional economic development the study needed some important data. However, the lack of data for the analyses periods prevented the study to reach this goal. For instance, to investigate the diverse impact of entrepreneurship on regional economic development the study required data on the diverse types and characteristics of entrepreneurship such as opportunity or necessity driven, innovative or non-innovative, formal or informal, and/or productive and unproductive entrepreneurship. In addition, the lack of time series data limited the study to use other more effective econometric models to investigate this relationship.

The thesis in the third research question aims to investigate the impacts of certain regional characteristics on new venture creation to provide empirical evidence and to draw a new framework for politicians and policy makers to increase entrepreneurial activities in their regions. However, the limitations of data prevent the study from drawing a wider framework. The presence of cultural, institutional, environmental, and political data may increase the power of these analyses.

8.1.3. Recommendations for Future Studies

The limitations of this study can be opportunities and open new avenues for the future studies. The researchers can expand different aspects of this study in many ways. First, researchers can use different type of entrepreneurship to further investigation of the nexus between entrepreneurship and economic growth and development. For example, formal and informal, opportunity or necessity-driven, and innovative and managerial types of entrepreneurship can be used. Second, the researchers can conduct studies at NUTS III regional level and district level. Third, researchers can investigate the impact of entrepreneurship on economic development by using entrepreneurship in different sectors. For example, the entrepreneurship measures represented as firm births, firm

deaths, turbulence, and self-employment in different sectors such as manufacturing, constructions, service, transportation, and agriculture can be used for the future studies.

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