The Causality Between Entrepreneurial Activities and Regional Economic Growth: Case of Turkey[1]

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Abstract

Entrepreneurship, by creating employment, fostering competitiveness or affecting employment, somehow contributes to economic development. While entrepreneurship is mostly defined or measured as numbers of self-employed, firm formation, business formation, new firm start-ups, firm births or net entry rates in the empirical studies, regional economic development is defined or measured as, the growth of gross domestic product (GDP), gross value added (GVA) and the change of employment/unemployment rate or productivity. The purpose of this article is to find the causality between entrepreneurship and regional economic development in Turkey at the NUTS1 level. In order to reach this aim, entrepreneurship is measured as firm formation and net entry, while regional economic development is measured by GVA, GDP and employment at two distinctive periods as 1987-2001 and 2004-2011 separately. This study is the first attempt to show such a relation between entrepreneurship and regional economic growth on the basis of the firm formation. The findings show that the causality between (or effect of) entrepreneurship and regional economic growth changes among regions, which clarifies regional similarities of disparities. Therefore, although the trends of entrepreneurship to affect regional growth in Turkey seem corresponding the findings of the current literature, some regions act differently.

1. Introduction

Entrepreneurship, a subject with its many different variations of field of studies, has a past of over a century. While entrepreneurship is a subject for economic development since Schumpeter, its effects are tested empirically only for the last two decades. On the other hand, it is a missing research field in Turkey, despite the various incentives and policies.

While entrepreneurship studies take a non- negligible part in regional studies, the theoretical framework of entrepreneurship in the regional economic development is not clearly defined, except creative destruction. This may be caused by conceptual variety of entrepreneurship or may be it is just a theoretically underestimated part in regional economic development. Entrepreneurship, by creating employment, fostering competitiveness or affecting employment, somehow contributes to economic development.

It can be said that entrepreneurship research is outlined and generally defined by three main traditions; Austrian, Chicago and German traditions. Briefly, while the Chicago tradition makes their point on assuming risk or not, the Austrian tradition points out to the idea of having something to lose or not; and the German tradition focuses on economic development. According to Schumpeter who is one of leaders of the German tradition (1934), economic development is a dynamic process and the entrepreneur is the agent of it. Even though the main traditions give an outline about the definition of entrepreneurship, its role in the economic growth, which was

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provided by different theoretical approaches cause confusion in definitions of entrepreneurship.

The creative destruction, which is introduced and defined as a dynamic process by Schumpeter, is accepted as the main theory that relates entrepreneurship and economic growth. This process simply causes closures or expanding or re-organization of the existing firms. This dynamic process also provides new technologies, adaptation to them and institutional changes and enhances the productivity.

The endogenous growth theory implicates that there is indefinite investment in human capital, which has spillover effects so, it reduces the return of capital accumulation. The endogenous growth theory basically emphases the importance of technology, knowledge and human capital in economic growth so the spatial production of knowledge occurs.

If the behavioral or microeconomic theories of entrepreneurship are excluded, Schumpeter's Creative Destruction is accepted as the first theory of entrepreneurship. With the explanations of innovation and knowledge spillovers, endogenous growth theory is one of the most important theories of economic growth.

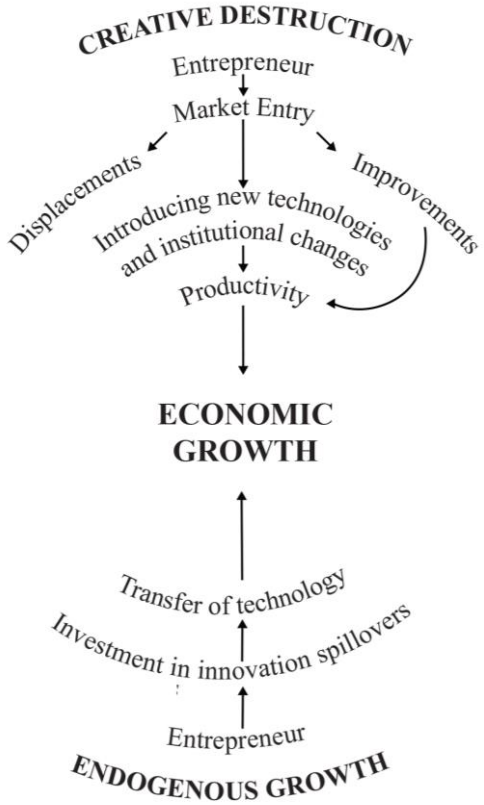

Figure 1: Linking entrepreneurship and regional economic development.

It is possible to say that the entrepreneur is the main actor for economic growth in the theory of Creative Destruction and Endogenous Growth Theory, since it is the entrepreneur who invests or introduces new technologies to the market and causes spillovers and enhances the economic growth (Figure 2).

Despite the fact that there are various definitions of entrepreneurship, the way entrepreneurship held up in the empirical studies is much simpler. According to the empirical studies (between the years 1994 and 2013) which directly investigate the effect of entrepreneurship on regional economic growth, entrepreneurship phrases or in other words the measurement of entrepreneurship in empirical studies vary into 10 definitions:

- Business ownership (Carree, van Stel, Thurik, & Wennekers, 2002, 2007)
- Entrepreneurship (GEM variables) (Valliere & Peterson, 2009; F. G. van Oort & Bosma, 2013; Van Stel, Carree, & Thurik, 2004; P. X. Wong, Y. P. Ho, & E. Autio, 2005)
- Firm birth (Acs & Armington, 2004; Callejon & Segarra, 1999; Reynolds, 1994)
- Net entry (Dejardin, 2011; R. C. Piergiovanni, Martin A. Santarelli, Enrico, 2012)
- New firm/business creation (Valliere & Peterson, 2009; P. K. Wong, Y. P. Ho, & E. Autio, 2005)
- New firm/business formation (Ashcroft & Love, 1996; Fritsch & Mueller, 2006; Mueller, van Stel, & Storey, 2006; R. Piergiovanni, Carree, & Santarelli, 2012; Van Stel & Suddle, 2007)
- New firm start-ups (Audretsch & Fritsch, 2002; D. B. Audretsch & M. Keilbach, 2004; Fritsch, 1997; van Stel & Storey, 2004)
- Firm birth (Callejon & Segarra, 1999)
- Self Employed/Employment (Audretsch, Carree, & Thurik, 2001; Fotopoulos, 2012; Van Stel et al., 2004)
- Turbulence[2] (Bosma & Nieuwenhuijsen, 2000)

Even though these definitions are much simpler than the general conceptual definitions, they are changing according to the authors' affiliation, conceptual and theoretical approaches. Even though the authors express or measure entrepreneurship in different words, except self-employed/employment and turbulence notions, all the expressions represent new firm formation as it is and will be given in this study.

While theories conceptualize the economic development or growth in terms of productivity, technology or knowledge occurred, minimizing the costs or dealing with the increasing returns, the empirical studies, by not classifying them in theories, give more simple outcomes of measurement of economic development or growth. The same way as entrepreneurship measured in empirical studies in 10 simple definitions, the economic growth also defined and measured in 3 themes of variable groups:

- Employment Change, Unemployment Rate or Employment Growth (Acs & Armington, 2004; Ashcroft & Love, 1996; Audretsch et al., 2001; Audretsch & Fritsch, 2002; Fritsch, 1997; Fritsch & Mueller, 2006; Mueller et al., 2006; R. C. Piergiovanni, Martin A. Santarelli, Enrico, 2012; Reynolds, 1994; Van Stel et al., 2004; van Stel & Storey, 2004; Van Stel & Suddle, 2007)
- GVA or GDP growth (Carree et al., 2002, 2007; Dejardin, 2011; Fotopoulos, 2012; R. C. Piergiovanni, Martin A. Santarelli, Enrico, 2012; Valliere & Peterson, 2009; Van Stel et al., 2004; P. K. Wong et al., 2005)

[2] Turbulence is explained as entry and exit of firms in Bosma and Nieuwenhuijsen (2000).

- Productivity Growth, Regional Productivity, Regional Productivity Rate or Labor Productivity (D. B. Audretsch & M. Keilbach, 2004; Bosma & Nieuwenhuijsen, 2000; Callejon & Segarra, 1999; F. G. B. van Oort, Niels S., 2013)

It is important at this stage to state that these measurements of course vary in the light of their studies' theoretical approaches, as were in the entrepreneurship part but they are given here without any theoretical classifications.

The purpose of this paper is to find the causality between entrepreneurship and regional economic development in Turkey at the NUTS1 level. In order to reach this aim, entrepreneurship is measured as firm formation and net entry, while regional economic development is measured by GVA, GDP and employment. One of the well-known techniques to identify the causal relations among the variables, correlation is used to measure the length, direction and the weight of the causal affects/relations between regional economic development and entrepreneurship.

2. Measuring Entrepreneurship's Effect on Regional Development

Entrepreneurship is mostly defined or measured as numbers of self-employed, firm formation, business formation, new firm start-ups, firm births or net entry rates in the empirical studies, regional economic development is defined or measured as, the growth of gross domestic product (GDP), gross value added (GVA) and the change of employment/unemployment rate or productivity (Reynolds, 1994; Audretsch et al., 2001; Audretsch at al., 2004; Valliere et al., 2009).

As Bosma et al. (2011) stated, many studies on competitiveness which tend to equate entrepreneurship with new firm formation and disregard the firm exit mechanism, are inspired by Schumpeter's (1934; 1942, 2010) work on the mechanisms of economic development, especially the role of entrepreneurship.

Referring to Porter (1990), Bosma et al. (2011) stress the importance of firm exit: firm exit reflects the selection mechanism that is a crucial outcome of the competition process and one of the causes of territorial competitiveness. The exits are important because resources are released that can be reallocated to more productive activities (Bosma et al., 2011). While Bosma et al. stresses the importance of firm exit they also point an important aspect related to firm exits which is the revolving door regime. Audretsch and Fritsch (2002) explain this issue on the basis of waste of resources in the case of new entrants would less efficient then the incumbents. In this type of scenario there would be no contribution to development, growth or productivity. This revolving door regime reflects a situation with high entry rates, but with no subsequent improvement of either employment levels or productivity (Bosma et al., 2011).

Schubert (2013) defines creative destructions as an evolutionary change. Evolutionary change is an inherently turbulent, restless affair, generating unpredictable and potentially large redistributions of well-being. He explains these definitions in two steps, the fundamental impact of the competition and motivational basis of economic behavior. He further explains that giving reference to Haberler (1950) and Metcalfe (2001) that; the kind of 'development' Schumpeter is interested in does not reflect the impact of ordinary price competition, but 'competition from the new commodity' (Schumpeter, 1942), of what the impact is much more fundamental.

Aghion and Howitt (1992) introduce an endogenous growth model which take into consideration Schumpeter's 'creative destruction'. As they explain this model

assumes that individual innovations are sufficiently important to affect the entire economy. In this model define a period, which is between two successive innovations. They further explain that this period has two effects, first of them is the Schumpeterian creative destruction which firms are motivated by the prospect of (temporary) monopoly rents after a successful innovation is patented, a next innovation will again destroy these rents as the existing good is being made obsolete by the Schumpeterian entrepreneur (Carree & Thurik, 2010). The other effect is the general equilibrium effect, which is working through the wage of skilled labor. Aghion and Howitt (1992) state that higher wages in this period, will reduce the monopoly rents that can be gained by exclusive knowledge of how to produce the best product.

In their later work Aghion and Howitt (1998) extend their model to show that a more competitive market structure may contribute to the economic growth. As Carree and Thurik (2010) explains, Aghion and Howitt (1998) add capital to their model of creative destruction. In order to show that capital accumulation and innovation are complementary processes and equal partners in the growth process. This have contributed to the endogenous growth literature by connecting purposive, profit-seeking investment in knowledge to the persons performing this task: entrepreneurs (Carree & Thurik, 2010).

Wennekers and Thurik (1999) explain the relationship between entrepreneurs and the endogenous growth theory by referring to Baumol (1993) and they also point out the long run rate of economic expansion, and claim that Baumol describes both the contribution of endogenous growth theory and the dilemma this theory is confronted with. They add that the suggestion of Baumol, where he explains the critical components (endogenous variables like capital investment and education) of a feedback process that affect productivity growth, but productivity growth, in turn, itself influences the value of these variables, after some lag which can be told about the exercise of entrepreneurship, investment in innovation, and the magnitude of activity directed to the transfer of technology that are influenced by past productivity growth achievements and they also, in their turn, influence future growth (Baumol, 1993).

Wennekers and Thurik (1999) criticize the endogenous growth theory about focusing explicit attention on the intermediate variables (human) capital formation and innovation but remaining entrepreneurship largely implicit and not shedding light on the underlying conditions of the entrepreneurial activity needed for (human) capital formation and innovation. Another, more general, critic is given by Carree and Thurik (2010) about the disappearing role of entrepreneurship, as it disappeared from economic theory is that it played no role in the neoclassical growth model developed by Solow, 1970. They criticize this model the technological improvements being exogenous and therefore being independent of economic incentives. Economic growth in the traditional growth models is achieved by capital accumulation and exogenous technological progress, both of which leave little room for any entrepreneurial role whatsoever (Carree & Thurik, 2010). Carre and Thurik (2010) also state that it is not common for endogenous growth models to explicitly address the issue of entrepreneurship as driving force of technological and economic development.

In his empirical findings, Fritsch (1997), states that for the case of West Germany, during the period of analysis, new firms obviously have been far less important for regional employment than is commonly assumed.

Audretsch et al. (2001), in a different way try to link self employment rates to unemployment rates. They explain that the literature uses micro level data and shows that small firms grow faster than large firms.

This suggests that, at the macro or country level, a larger presence of small firms contributes positively to economic performance as well. Self-employment rates represent a specific measure of the presence of small and very small firms in an economy. However, it is not clear that higher self-employment rates automatically lead to improved economic performance.

While conceptualizing effects in two ways as 'refugee' effect (a (positive) effect of unemployment on self-employment) and 'entrepreneurial effect (a (negative) effect of self-employment on unemployment), Audretsch et al. (2001) finds empirical evidence on the 'refugee' effect.

In another study, Audretsch and Fritsch (2002) gets two different findings as for the first period (1980s) the impact of new firm formations has no significant impact on employment change and for the second period (1990s) the regions with a higher start-up rate exhibit higher growth rates. They explain this difference relies on two different growth regimes.

On the other hand, Acs and Armington (2004), in the context of an endogenous growth model with a particular emphasis on knowledge spillovers, empirically prove by counting economic growth as employment growth that higher rates of entrepreneurial activity were strongly associated with faster growth of local economies.

van Stel and Storey (2004), similarly to Audretsch and Fritsch (2002) find no evidence that changes in new firm formation rates in the 1980-83 period explained changes in employment 1984–91. Contrary, they find evidence that only later in the decade that increased rates of new firm formation nationally appear to lead to job creation. They also explain this conflict is caused by the national public policy, which focused on raising new firm formation as a key strategy for creating jobs and lowering unemployment.

Another study of van Stel and Suddle (2007) which investigates the relation between new firm formation and regional employment in industry level and by using Almon lag, has findings of the maximum effect of new businesses on regional development is reached after about 6 years. As van Stels' previous study, this study has also taken time lags into consideration. Similarly to Van Stel and Suddle (2007), Fritsch and Mueller (2006) also uses Almon lags and in addition they define regions according to their labor productivity as low, medium and high. They have evidence of the effect of new business formation on employment growth tends to be considerably more pronounced in regions with a high density of economic activity and also evidence of a clear difference in the effects according to the level of regional labor productivity as the higher the regional productivity level is, the larger the positive-employment effects are.

Mueller et al. (2006) in their empirical study introduces 'wrong type of entrepreneurship' and states that countries with higher rates of new firm formation

has also higher rates of employment growth and lower rates of new firm formation has lower rates or zero impact on employment growth.

Summarizing the empirical studies, it is possible to say that there is certain pattern in findings of the studies, which published after 2000. They all have evidence on both positive impacts, negative impacts or no effects of entrepreneurial activities on employment growth. Two of them explain these conflicts in Germany and Great Britain cases (Audretsch & Fritsch, 2002; van Stel & Storey, 2004) as it is caused by different growth regimes or policies. One other Germany case study (Fritsch & Mueller, 2006) explains these conflicts in terms of productivity levels of labor force and determines best time lag for the subject of matter using Almon lags as Van Stel and Suddle (2007) explained the Netherlands case. Mueller et al. (2006) explains the conflicts in Great Britain, according to the rates of new firm formations. In the same way, Acs and Armington (2004) explains their findings on rates of entrepreneurial activities.

Coming back to measurements of economic development or growth, Carree et al. (2002) by hypothesizing an 'equilibrium', find evidence for the relationship between the rate of business ownership and per capita income that is U-shaped. They explain the U-shaped pattern has the property that there is a level of economic development with a "minimum" business ownership rate. They find the rate of business ownership in OECD countries, influence economic growth through deviations from the equilibrium rate. In their later, 'revisited' study, Carree et.al. (2007) state that for the business ownership being below its 'equilibrium' rate, there appears to be a significant negative effect on economic growth.

Van Stel et al. (2004) investigate the impact of the Total Entrepreneurial Activity (TEA) rate on economic growth and find that there is an impact but not a simple linear one of the TEA rate on GDP-growth. In addition they find a significant non-linear effect: the TEA rate has a negative effect for the relatively poor countries, while it has a positive effect for the relatively rich countries.

P. K. Wong et al. (2005) investigate firm formation and technological innovation as separate determinants of growth by using four TEA rates (high growth potential TEA, necessity TEA, opportunity TEA and overall TEA). They have findings of insignificance of overall TEA, suggesting that the existence of entrepreneurial activities that do not contribute to growth. They claim that this is consistent with previous findings of Audretsch et al. (2001) by meaning the 'refugee' effect. They also state that these findings may be interpreted as supporting the proposition by Carree et al. (2002) that it is the deviation of entrepreneurship levels from the equilibrium rate that influences economic growth, and not just the existence of entrepreneurial activities. In their findings of the four types of entrepreneurship, only high growth potential entrepreneurship found to have a significant impact on economic growth.

In a similar way and by extending the model of Wong et al. (2005) and using same variables and sample size, Valliere and Peterson (2009) find that in developed countries, a significant portion of economic growth rates can be attributed to high-expectation entrepreneurs exploiting national investments in knowledge creation and regulatory freedom. However, in emerging countries this effect is absent.

Dejardin (2011) proves the positive impact of entrepreneurship on economic performance at the firm level by industries. He states that the emerging picture is

different at the regional and national levels and, more specifically, when economic performance measured through the capacity of the aggregated economy to create new value. He further explains that the results for manufacturing suggest negative relationships between firm net entry and economic growth or, more probably, autoregressive relationships in the growth process. As for services, statistical significance appears to support the conclusion that net entry may have positive lagged effects on regional economic growth and the results for GDP growth in the services industry, although rather weak, are by and large consistent with previous findings, that there is a positive impact of net entry on economic growth.

Fotopoulos (2012) has findings on non-parametric regression of self-employment rates on GDP per capita effect is positive. In additionally he states that, self-employment rates in excess of what the level of economic development would have predicted have positive effects on regional economic growth and thereby, no evidence for penalty of having too much of self-employment has been produced.

For the last measurement of growth, productivity related variables are considered in the light of the empirical studies by Bosma and Nieuwenhuijsen (2000), D. B. Audretsch and M. Keilbach (2004) and F. G. van Oort and Bosma (2013).

Callejon and Segarra (1999) investigate the significant part of new firms contribute to improve total factor productivity by adopting modern technology that is embodied in the last vintage equipment they use. They found evidence has been found that exits, as well as entries, impact positively on total factor productivity and this positive effect of exit on the productive efficiency is compatible with the dynamic approaches that associate business mobility with the process of innovation, and with asymmetries in information among agents.

Similarly, Bosma and Nieuwenhuijsen (2000) take entry and exit rates into account as they define it as 'Turbulance' and investigates whether turbulence contributes to the growth of the total factor productivity (TFP) in regions. They find evidence at macro level that turbulence contributes to the growth of the TFP. They explain further details for distinction of industries. In the service sector, they found that turbulence affects the TFP growth in a region but this effect of turbulence does not occur immediately. In contrary, they find no TFP effect of turbulence was found for manufacturing but they explain as the model provides estimates of the direct effect of turbulence on TFP so the possibility of a long-term effect cannot be ruled out.

D. Audretsch and M. Keilbach (2004) state that economic knowledge emerges from a selection process across the generally available body of knowledge, actively driven by economic agents. They suggest that entrepreneurship is an important mechanism in driving that selection process hence in creating diversity of knowledge, which in turn serves as a mechanism facilitating the spillover of knowledge. In their empirical findings, they prove that entrepreneurship enhances growth through regions with higher levels of entrepreneurship exhibit stronger growth in labor productivity. They furthermore explain this finding as the start-up of a new firm contributes to diversity by attempting to commercialize knowledge and a greater amount of entrepreneurship expected to be associated with more diversity and therefore higher growth.

F. G. van Oort and Bosma (2013) provide empirical findings in the basis of agglomeration economies as they find confirmation for the importance of both types of early-stage entrepreneurship and patenting activity in explaining regional variation in labor productivity. In addition, they find that the impact of growth-oriented

entrepreneurship and patenting activity is complementary to an important part of the urbanization economies effects and in contrary they find no evidence for the effect of innovation-oriented entrepreneurship or entrepreneurs who do not expect to grow. They state that an interesting finding was also that regions with high levels of low-growth-oriented entrepreneurship (that is, early-stage entrepreneurs expecting to generate at most one job apart from their own over the next 5 years) were also associated with higher levels of labor productivity.

3. Causality

With the beginning of planned era, after 1963, with several different policies given in the five year development plans, Turkeys' policies about entrepreneurship has constantly evolved according to the economic and political situations of the country. While there were only policies about firm sizes at the beginning, Turkey's entrepreneurship policies are changed into more complex and detailed policies including the legal regulations and various institutions. With the introduction of different types of incentives, many crises affected firm formation and firm closure rates. Regional disparities were always a matter of subject since early years of the establishment of the Republic of Turkey. In the first two 5 Year Development Plans, region notion was not clearly discussed. Even in the third plan, regional disparities issue was not discussed, but the usage of local sources for the industrialization process was giving signs about regional policies were induced in the following plans.

After 1980s, with the effect of political and economic tension and adopted neoliberal policies, regional policies were re-defined. Instead of central government based development, the development process became local based, where local institutions and actors were important. The institutions and definitions are changed through the planned era as can be seen in the figure below, where as the conceptual issues of entrepreneurship in the literature, the definitions about entrepreneurs in the development plans are mixed with the firm and SME notions (Figure 2).

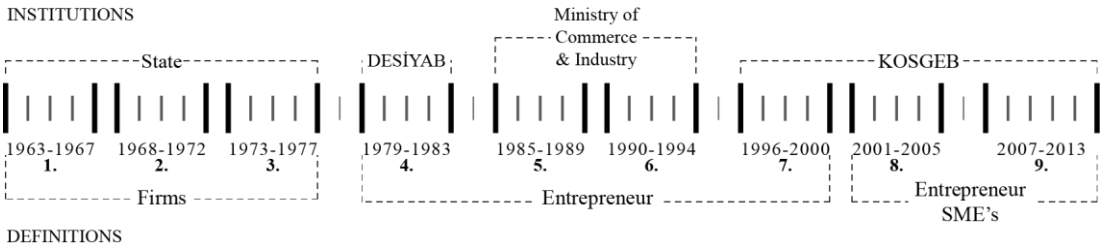

Figure 2: The institutions and definitions among 5 year development plans.

While there is no special institution for entrepreneurs (but the state) in the first three development plan, since the fourth plan there were different institutions, but always with the state initiative (Figure 1). With the politicy changes at the 80s, the institution for entrepreneurs was DESIYAB (State Industry and Labour Investment Bank). After 1985, until 1995 there was not special insitution was in charge for entrepreneurs but the Ministry of Commerce and Indusrty. After 1996 KOSGEB (Small and Medium Enterprises Development Organzation) started to support the entrepreneurs.

At the end of 90s' while the notion of SMEs and entrepreneurs are almost mixed in policies in Turkey, the effect of them in the economy has became obvious. In the year 1999, 99,9% of industrial firms was SMEs. 55,9% of the employment was covered by SMEs and 24,2% of the added value was produced by SMEs (DPT, 1995). Even though SMEs had such important place in the Turkish economy, the rate of the loans

given to SMEs was only 5%. The eighth development plan was a solution for the capital problems for SMEs. New policies for increasing the competitiveness of SMEs are presented: financial supports, supports of employment, loan, energy and tax reductions (DPT, 1995).

The 2001 crisis' effects were taken into consideration in ninth development plan (2007-2013). While the eighth plan (2001-2005) suggested the development of high added value sectors, the ninth suggested developing R&D and innovation. New policies about the collaboration of universities and industrial firms suggested and new sector based organized industrial areas were introduced for local development (DPT, 2000). In this term, entrepreneurship became a tool for local development and new collaboration projects between state, private investors, universities and NGOs started to develop entrepreneurship (DPT, 2000).

With the year 2012 SMEs were covering the 99,9% of total new entries. 76% of employment, 54% of added value, 56% of investments, 56% of production and 60% of exports were covered by SMEs (DPT, 2013). Unlikely to the 1999 data, by the year 2012, 25% of the loans were used by SMEs (DPT, 2013). While SMEs, or we can say entrepreneurs, becoming more important in the economy, innovativeness, productivity and employment creation issues of entrepreneurs started to be discussed.

3.1. Prefatory Remarks

The purpose of this study is to explore empirically whether entrepreneurship affects regional economic development or not. In other words, in this study, the causality between entrepreneurship and regional economic growth in Turkey is investigated. The time series data used in this study is gathered from Turkish Statistical Instute (TSI) at NUTS1 level.

While examined empirical studies accepted entrepreneurship in 10 different ways, in this study it is accepted as firm formation. Including the firm closure and net entry (firm formation-firm closure) it is aimed to find the actual entrepreneurship.

For the purpose of this study, correlation analysis for data covering NUTS1 regions in Turkey in two periods as between 1987 and 2001 and between 2004 and 2011 has been applied.

The economic growth is usually explained as GDP, GVA or employment growth. In this study, we are covering the two of them (GVA or GDP and Employment) as the dependent variables, which are used for explaining economic development, are:

- Gross Domestic Product (GDP (per capita)) is the value of total output produced in an economy which is given in the 1987-2001 time period for this thesis.
- Gross Value Added (GVA (per capita)) is the value of goods or services produced in an economy which is given in the 2004-2011 time period for this study. Generally GVA plus the taxes on products, minus the subsidies on products gives the GDP. But in this study neither the taxes nor the subsidies is taken into consideration.
- Employment (EMP) is the labour force employed which is given in the 2004-2011 time period for this study.
- Unemployment (UNEMP) is the labour force unemployed (but looking for a job) which is given in the 2004-2011 time period for this study.

The reason for using both GDP and GVA to explain the standarts of living, is the available data issue in Turkey. Unfortunately between the years of 1987 and 2001 the available data was GDP and between the years 2004 and 2011 the available data was GVA. This issue determined the two periods of this empirical study.

Table 1: Available data.

Data	Available Data	1965 - 1979	1980	1981 - 1984	1985	1986	1987-1989	1990	1991-1994	1995	1996-1999	2000	2001	2002-2003	2004-2006	2007-2009	2010 - 2011	2012	2013
FF	1965-2009																		
FC	1965-2010																		
GDP	1987-2001																		
GVA	2004-2011																		
EMP	2004-2012																		
UNEMP	2004-2012																		

The independent variables are Firm Formation (FF) and Firm Closure (FC), which was available between the years 1965 and 2013 in NUTS3 level. Net Entry, the third and last independent variable is Net Entry (NE) which is calculated as following:

$$Net\ Entry = Firm\ Formation - Firm\ Closure$$

Unfortunately it was not possible to include sectoral stuctures in this empirical study. It is believed that including sectoral structures of regions might have helped to explain more about the effect of entrepreneurship on regional economic development.

As mentioned, during the literature survey, 23 empirical studies (which directly investigate the effect of entrepreneurship on regional economic development) were examined about the way that they define entrepreneurship, about how they measure regional economic development (or growth), the models or statistical methods conducted, the variables they took into consideration and the scale of the empirical study. While their methodologies vary into different methods, it is possible to say that correlation method grounds most of them. Therefore this analysis is mainly based on correlation.

Correlation is a common method to measure and describe the relation between two variables including the dependency, where the value of ‘1’ is total positive correlation, the value of ‘0’ is no correlation, and the value of ‘-1’ is total negative correlation. In this study the Pearson Correlation Coefficients method is used. The correlated variables are given in the following table (Table 2). IBM SPSS Statistics 20 is used both for calculating growth rates and correltaions.

Table 2: Dependent and independent variables and combinations for correlation tests.

	GDP	GVA	EMP	UNEMP	GDP Growth Rate	GVA Growth Rate	EMP Growth Rate	UNEMP Growth Rate
FF	+	+	+	+	+	+	+	+
FC				+				+
NE	+	+	+	+	+	+	+	+
FF Growth Rate					+	+	+	+
FC Growth Rate								+
NE Growth Rate					+	+	+	+

The data gathering problems, the legal regulations of administrative borders and the changes in provinces (in 1989 Aksaray, Bayburt, Karaman and Kırıkkale; in 1990 Batman and Şırnak; in 1991 Bartın; in 1992 Ardahan and Iğdır; in 1995 Yalova, Karabük and Kilis; in 1996 Osmaniye and in 1999 Düzce become a province) and the final statistical regulation in 2002 (as 3 digits NUTS) has limited this study in order to work at a different scale. The problem was that the data were in provincial level before 2002 and after 2002 it was in NUTS2 levels. Using the NUTS2 level data was leading this study in a statistical confusion, since before 2002 there were 6 times of provincial changes and gathering some neighbour disticts together to generate provinces and the data was not defined suitable for these changes. These issues led this study to empirically test the effect of entrepreneurship on regional economic development in NUTS1 levels, since NUTS1 levels are covering a wide range of provinces, without leading the study to some statistical misunderstandings or underestimations.

3.2. Empirical Findings

While the empirical findings of region specific correlation tests give clues about regional similarities, some combinations such as ‘FF&GDP’, ‘NE_GR&GDP_GR’, ‘NE&GVA_GR’ and ‘FC_GR&EMP_GR’ did not give any significant results. Above all, the combinations that include the variable ‘NE_GR’ did not give much significant results as other variables (Table 3).

Table 3: Region specific correlation test results: significant results.

	TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8	TR9	TRA	TRB	TRC
FF&EMP	+						+		-		+	+
FF&EMP_GR	+						+		-		+	
FF_GR&EMP_GR	+					+			-			
FF&GDP												
FF&GDP_GR	+	+	+	+	+	+	+	+	+			
FF_GR&GDP_GR				+		+	+			+		+
FF&GVA	+						+				+	+
FF&GVA_GR			+	+	+	+						
FF_GR&GVA_GR	+		+									
NE&EMP		-	-			-					-	
NE&EMP_GR			-						-			
NE_GR&EMP_GR				+								
NE&GDP												
NE&GDP_GR	+	+	+	+	+	+		+	+			
NE_GR&GDP_GR												
NE&GVA		-	-			-			-		-	
NE&GVA_GR												
NE_GR&GVA_GR								+	-			
FC&UNEMP					-							+
FC&UNEMP_GR						-				-		
FC_GR&UNEMP_GR										-		

The significant correlation tests results are given above, as seen, tests resulted significant both positive and negative correlations.

3.2.1. Firm formation and firm formation growth effects on regional economic growth

The combinations of GDP which is the only representative for the years between 1987-2001 did not give any significant results for the combination of 'FF&GDP'. While most of the regions except TRA, TRB and TRC resulted significantly positive for the combination of 'FF&GDP_GR', the combination of 'FF_GR&GDP_GR' resulted significantly positive only in the TR4, TR6, TR7, TRA and TRC. These results can be explained by the effect of firm formation rates in some regions might not be enough to effect gross domestic product growth directly but the growth of firm formation is promising at the level of effecting GDP growth.

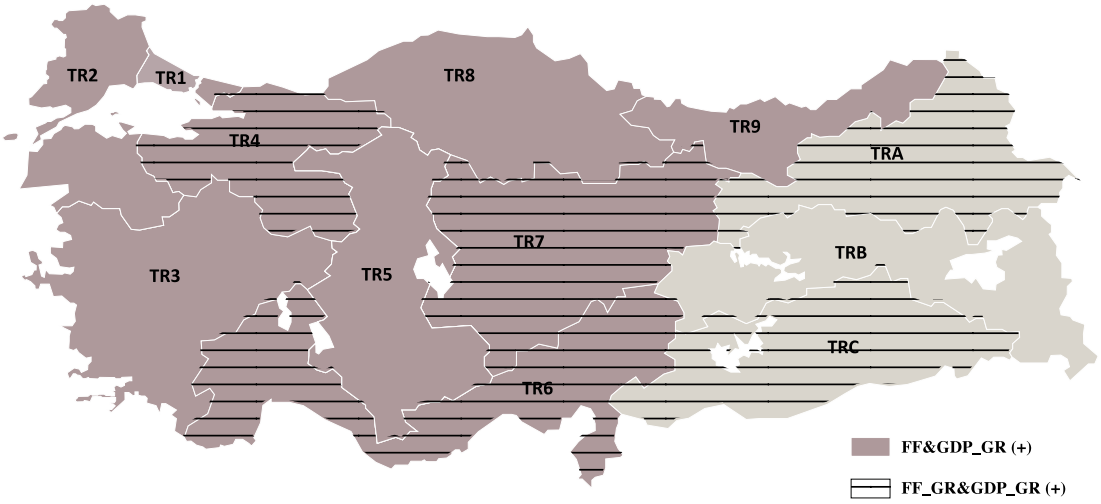

Figure 3: Firm formation effects on gross domestic product

The significant results of firm formation and employment resulted negative only in TR9 region in the combination of 'FF&EMP_GR'. While TR1, TR7, TRA and TRB regions resulted significantly positive for the combination of 'FF&EMP', the same regions except TRC resulted also significantly positive for the combination of 'FF&EMP_GR'. The last combination at employment issue was 'FF_GR&EMP_GR' resulted significantly positive at TR1 and surprisingly at TR6 regions.

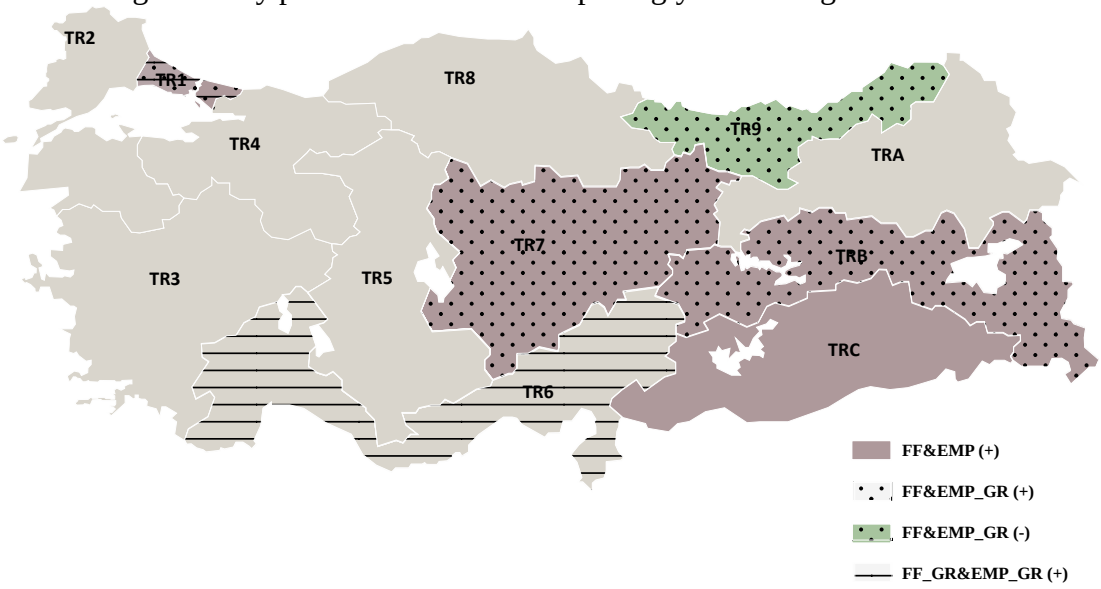

Figure 4: Firm formation effects on employment

The significant results of firm formation and gross value added resulted relatively similar to the FF&EMP results in the regions TR1, TR7, TRB and TRC, they both resulted significantly positive for the combination of 'FF&GVA'. While western regions (TR3, TR4, TR5 and TR6) resulted significantly positive for the correlaton 'FF&GVA_GR', only two of the regions, TR1 and TR3 resulted significantly positive for the correlation of 'FF_GR&GVA_GR'.

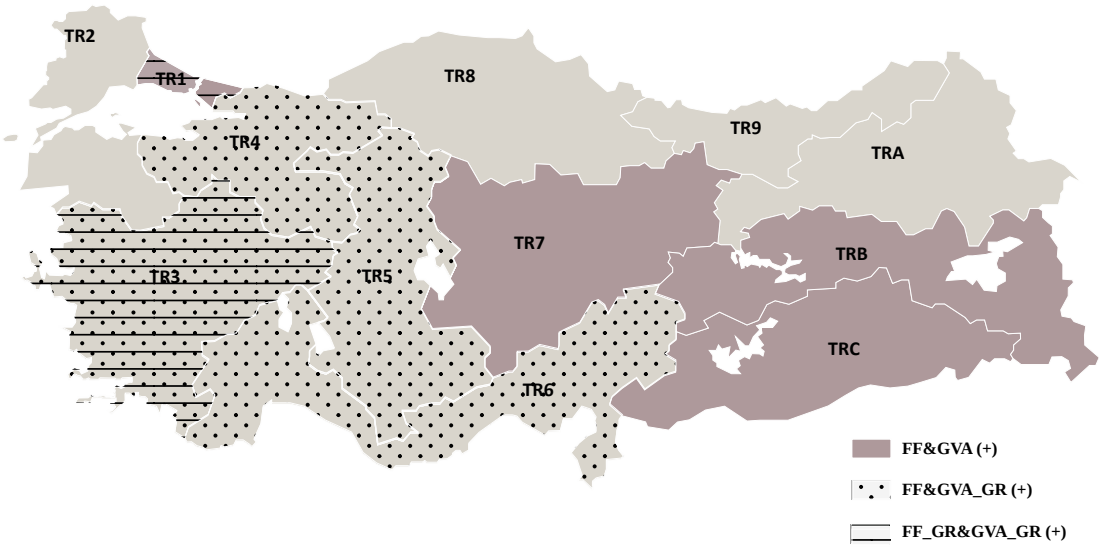

Figure 5: Firm formation effects on gross value added

3.2.2. Net entry and net entry growth effects on regional economic growth

The combinations of NE&GVA did not give any significant results in TR7, TRA and TRC. The correlation tests on net entry and gross value added resulted slightly confusing. While most of the regions resulted significantly positive for the combination of 'NE&GDP_GR', the combination of 'NE&GVA' resulted significantly negative with the same or more regions.The regions TR2, TR3, TR6 and TR9 resulted both positive and negative with different variations. This may explained as net entry does not diretly effects the GVA in this particular regions, but have an impact on the GVA growth.

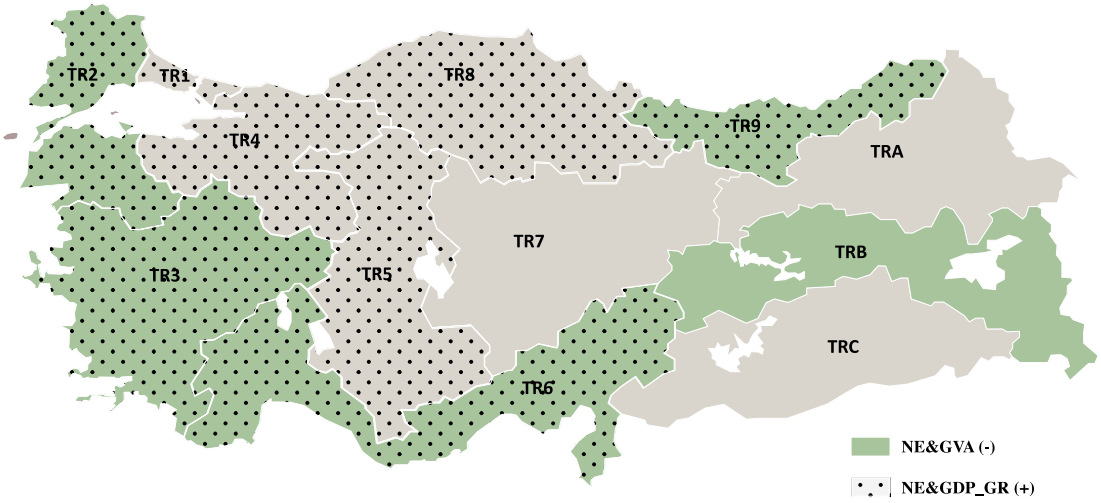

Figure 6: Net entry effects on gross domestic product and gross value added

While the combinations of NE&EMP did not give any significant results in most of the regions, there are no significantly positive results either. Relatively similar to the GVA; TR2, TR3, TR6, TR9 and TRB regions responded significantly negative to employment.

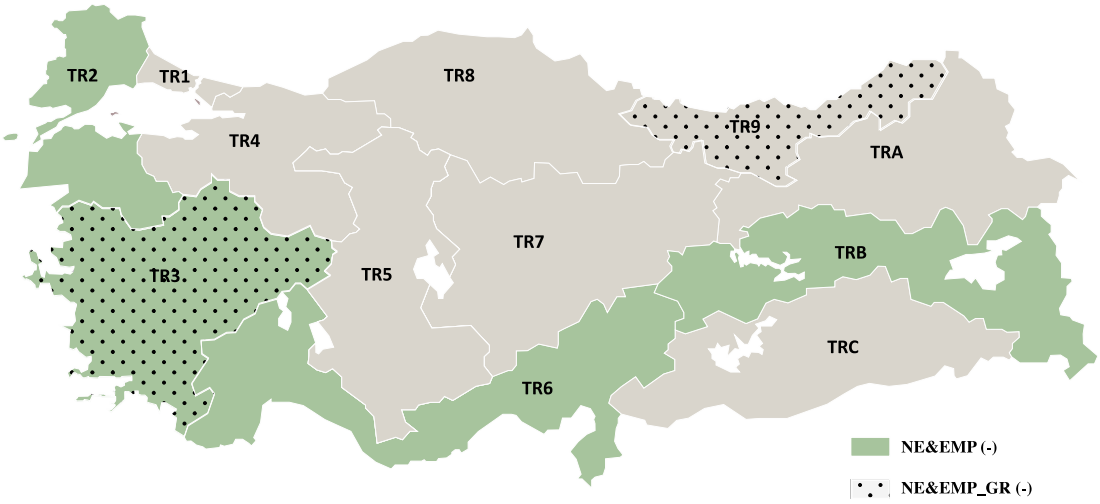

Figure 7: Net entry effects on employment

3.2.3. Firm closure and firm closure growth effects on regional economic growth

For brifly stating, we expect that the regions who responded significantly positive to FF and NE combinations, would result significantly negative for the combinations of firm closure and unemployment. This expected result only gathered from TRC region. While most of the regions did not give any significant results, TR5, TR6 and TRA regions responded significantly negative to firm closure and unemployment correlations.

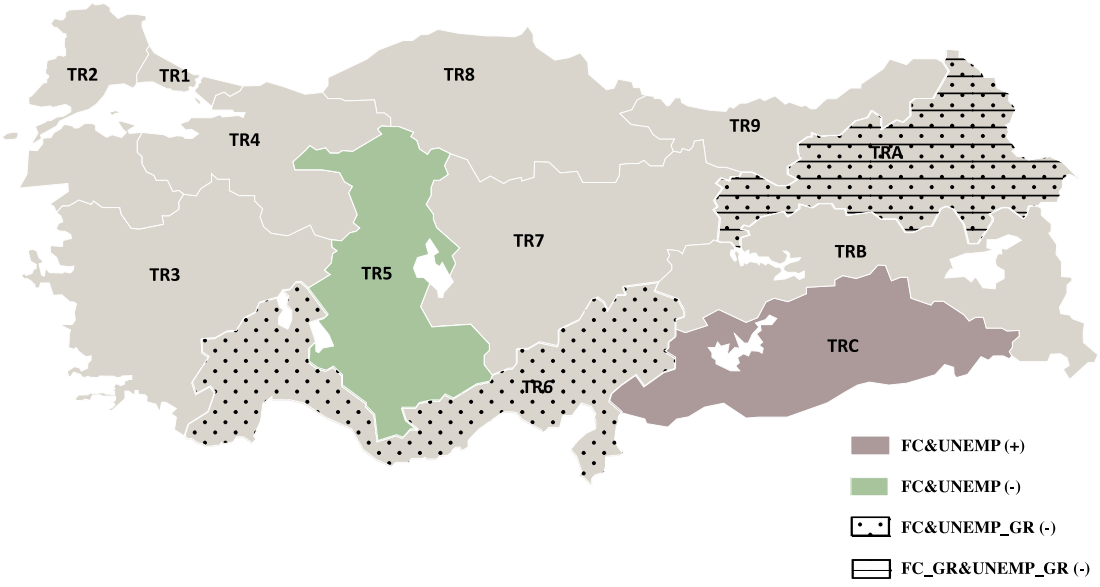

Figure 8: Firm closure effects on unemployment

3.3. Discussion

At the beginning of this chapter, it is mentioned that entrepreneurship has different empirical measurement criteria. In this paper, it is accepted as firm formation and to measure the effects on regional growth more clearly, net entry is added to the correlation tests.

The outcomes of the region specific correltaion tests gave impressions about regions' response for firm formation and net entry. While defining the regional disparities as we may say similarities, first we group the combinations as one type, second we took into consideration same responses from regions and last, regions have same responses which do not have conflict responses.

Table 4:Grouping the combinations as one type

	FF&EMP	FF&GDP	FF&GVA	NE&EMP	NE&GDP	NE&GVA	FC&UNEMP
TR1	+	+	+		+		
TR2		+		-	+	-	
TR3		+		-	+	-	
TR4		+		+	+		
TR5		+			+		-
TR6		+		-	+	-	-
TR7	+	+	+				
TR8		+			+	+	
TR9		+		-	+	-	-
TRA		+					
TRB	+		+	-		-	
TRC	+	+	+				+

As it can also be seen in the table 3,4 and figure 5, while TR1, TR7 and TRC (group 1) has similarities at the point of their responses to the combinations of 'FF&GDP', 'FF&GVA' and 'FF&EMP'. TR4 and TR8 (group 2) has also similar responses as group 1, while the difference is that group 2 responded significantly only to the 'FF&GDP' correlations and also to some variations of 'NE&GDP' combinations. We can say that TR1 is in the middle of group 1 and 2 as it responded both positive to FF combinatios and NE combinations. Group 1 and 2 has no negative significant results to any of the combinations.

TR2, TR3, TR6 and TR9 (group 3) has all significant positive responses to any kind of 'FF&GDP' and 'NE&GDP' correlations and significant negative responses to 'NE&EMP' and 'NE&GVA' correlations. The difference between TR2&TR3 and TR6&TR9 was that TR6 and TR9 responded significantly negative to 'FC&UNEMP' in addition. At this point we may say that TR5 is similar to TR6 and TR9. Also TRB acted similarly to TR2 and TR3 with a slight difference: its' response to the 'NE&GDP' correlations. Above all of the regions, TRA has no similarities with any other regions except its' significant positive response to 'FF&GDP' correlation.

We can say that group 1 and group 2 almost perfectly refletcs the general findings in the literature. If we sum up these findings as higher rates of entrepreneurship causes economic growth (Audretsch and Fritsch (2002), van Stel and Storey (2004), van Stel et al. (2004), Wong et al. (2005), Valliere and Peterson (2009)), the findings of this study overlaps with the general findings of the literature.

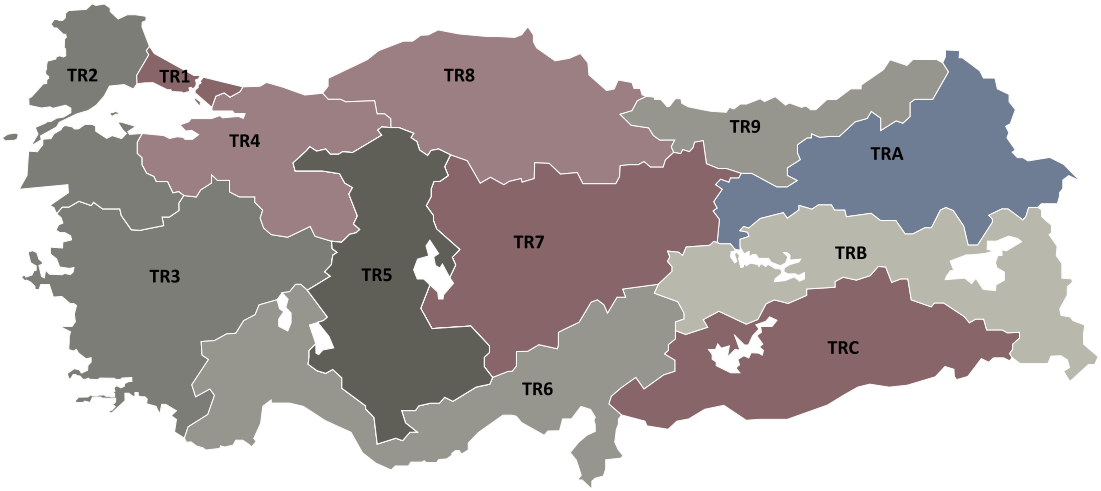

Figure 9: Regional disparities according to region specific correlation tests.

4. Conclusion

With the purpose of finding the effect of entrepreneurship on regional economic development in the case of Turkeys' NUTS1 regions, this study had some challenges. Entrepreneurship has several meanings conceptually, as well as it also has different measurement issues empirically. The wide research area of entrepreneurship causes confusion at the point of empirical studies. One may ask whether is it correct to measure entrepreneurship only as firm formation? This paper does not give distinctions about definitions of different disciplines, but certainly clarifies about how regional science defines and measures it. Only the last two decades' studies had attampts to link entrepreneurship to regional science empirically.

The region specific tests gave both positive and negative significant results. This may mean that entrepreneurship (firm formation) helps regions to preserve their performances but not enough to develop further, which led us to understand the similarities in regional characteristics. These results are also consistent with the findings in the literature. First; growth regimes over time in Turkey in our first part data (1987-2001) and second part data (2004-2011) are different. After 2001 entrepreneurship policies in Turkey become more like 'SME' policies. Various incentives for SMEs has been introduced since then and this may caused by 'wrong type of entrepreneurship' as Mueller at el. (2006) explains. Also gathering positive significant results for FF&GDP correlations and significant negative results for NE&GVA or NE&EMP correlations can be explained by different growth regimes (as Audretsch and Fritsch (2002) and van Stel and Storey (2004) explains), since we measure the economic growth as GDP for first part data, and GVA and EMP for second part data.

Regional disparities among the regions of Turkey has been an agenda and minimalization of these disparities has been one of the most important economic growth policies in Turkey since 1960s'. While the regions that has higher rates of entrepreneurship has higher rates of economic growth (as Audretsch and Fritsch (2002), van Stel and Storey (2004), van Stel et al. (2004), Wong et al. (2005), Valliere and Peterson (2009) empirically proves) in Turkey, there was only one region that seems to be not fitting in this situation (TR7) as corresponding the tests as developed regions like TR1.

The essential issue about this paper was this case had been never tested in the case of Turkey. At this point this study contributes literature in the way of attampting to

explain the entrepreneurships' effect on regional economic growth in the case of Turkey. The data gathering issues in Turkey obviously limited this study, we think that it was essential to include the sectoral data to this study, in order to attribute meaning to the regional diversification of regions' responces to entrepreneurship.

For further researches, it is essential to test this issue with more sophisticated methodologies and more detailed data (as given above) and considering sectoral structures, wages and the investments.

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