

THE EFFECTIVENESS OF GOVERNMENTAL GRANT MECHANISMS IN TURKEY: LINKING WITH ENTREPRENEURSHIP

Mehmet Onur PARTAL¹ Feride GÖNEL²

Gönderim tarihi: 04.11.2019 Kabul tarihi: 28.11.2020

Abstract

Small businesses play a significant role in economic development and growth in Turkey. This paper explores a rather different puzzle, which can be named as the questioning of the existence or non-existence effect of government grants on entrepreneurship. In order to boost regional development, the government allocates grants to current or prospective entrepreneurs in order to increase the number of new firms, jobs, and economic activities. However, the grant programs are now controversial since they are criticized of their effectiveness. In this paper, the effectiveness of major governmental grant mechanisms has been assessed through econometric analysis. Contrary to the expectations, the outcomes of the analysis showed that the grants provided by public institutions have insignificant effects on the stimulation of entrepreneurship, in the context of new firm establishment and new firm birth rate. Therefore, this result led to further need to search the outcomes of types and amounts of governmental grant mechanism.

Keywords: Government Grants, Entrepreneurship, Regional Development, Turkey

JEL Classification: M13, O18, R10

TÜRKİYE'DE KAMU HİBE MEKANİZMALARININ ETKİNLİĞİ: GİRİŞİMCİLİK İLE KURULAN BAĞLANTI

Öz

Küçük işletmeler, Türkiye'nin ekonomik kalkınması ve büyümesinde önemli rol oynamaktadır. Bu çalışma ile kamunun sağladığı hibe mekanizmalarının girişimcilik üzerinde var olan veya olmayan etkileri sorgulanmaktadır. Bölgesel kalkınmayı tetiklemek için girişimcilere kamu fonları aktarılmaktadır. Bu vesile ile yeni firma sayılarının, istihdamın ve ekonomik hareketliliğin artırılması hedeflenmektedir. Fakat günümüzde kamunun sağladığı hibeler verimlilik çerçevesinden bakıldığında sorgulanmaktadır. Bu makalede, ekonometrik analizler aracılığıyla Türkiye'nin öne çıkan hibe programlarının verimliliği incelenmektedir. Beklentilerin aksine, çıkan sonuçlar göstermektedir ki, dağıtılan hibelerin kurulan yeni firma sayısı ve yeni firma doğum oranına anlamlı bir etkisi bulunmamaktadır. Bu araştırma neticesinde, hibe mekanizmaların türlerine ve miktarlarına göre yeni çalışmaların yapılmasına ihtiyaç duyulduğu ortaya çıkmaktadır.

Anahtar Kelimeler: Devlet Destekleri, Girişimcilik, Bölgesel Kalkınma, Türkiye

JEL Sınıflandırması: M13, O18, R10

¹ Expert, Istanbul Development Agency, e-mail: onurpartal@hotmail.com,
ORCID ID: 0000-0003-4037-0201

² Professor, Department of Economics, Yıldız Technical University, e-mail: gonel@yildiz.edu.tr,
ORCID ID: 0000-0001-7946-9298

1. Introduction

In the last few decades, the linkage between regional development and entrepreneurship has been becoming a more important topic since public demands and services become more custom-designed. Policymakers both in the national and regional administrative levels see entrepreneurship as one of the main drivers for economic development. This positive perspective leads policymakers to help finance the projects of entrepreneurs through different ways. In the light of all these, this relationship becomes more attractive for social scientists and enriches the current literature. This paper's objective, parallel to this trend, is to discover if there is any significant relationship between entrepreneurial activities in small business for the case of Turkey and major public support mechanisms guided by public institutions on regional level.

1.1. Financing Entrepreneurship in the Context of Regional Development Efforts by Governments

The concept of regional development and/or regional economic issues has been attracting much interest in recent years. This attraction may stem from the rising popularity of decentralization policies due to regional disparities.

According to OECD³ regional development is a broad term but can be seen as a general effort to reduce regional disparities by supporting (employment and wealth-generating) economic activities in regions. From the perspective of the European Union⁴, "regions and local development" is one of the 15 major topics covered in the agenda. Under this major topic, there is a subtopic called "regional policy", which targets EU regions and cities, boosting economic growth and improving quality of life through strategic investment. The EU has also formed a committee on regional development under the European Parliament and founded the European Investment Fund to support entrepreneurship and innovation in Europe.

In order to help regions economically develop and improve living standards, entrepreneurship is mentioned as one of the major game changers not only by international institutions but also researchers. Schumpeter (1911) points out that economic processes are organic; and mechanisms of change come from within the economic system. Entrepreneurship is, therefore, one of the key elements of economic advancement; moreover, changes in the economic system are driven by innovation, which is created by entrepreneurs.

³ <http://www.oecd.org/cfe/regional-policy/regionaldevelopment.htm> (access on Jan 15th, 2019).

⁴ https://europa.eu/european-union/topics/regional-policy_en (access on Jan 15th, 2019).

According to the Cambridge Dictionary, the term “innovative” means “using new methods/ideas⁵”. Therefore, innovative projects are meant to embrace new methods and/or ideas. Obviously, there is a necessity for entrepreneurs to access to finance in order to implement their innovative projects. There are various ways for an entrepreneur to find financial resources. These may be personal acquaintances, banks, investors, government funds or other resources. Attracting investors to meet the financial needs of entrepreneurs is a difficult task, and it can sometimes be more expensive since investors may demand high percentages of shares and privileges from the established business.

Almost all countries worldwide involving the Turkey allocate grants to a large portfolio of schemes which is accessible by entrepreneurs. Government grants are public subsidies offered to a recipient for business or personal purposes. The subsidy is not expected to be reimbursed, and may be used for research, business development, education or other endeavors that are anticipated to support a common cause. The grant offering typically includes conditions that must be met, such as reporting performance or results⁶.

From an entrepreneurial standpoint, government grants are zero cost financing opportunities despite the tough competitiveness of application processes. However, it must be emphasized that the situation may differ from the perspective of governments. Although governments assume that the supports are efficient due to the cost savings and better utilization of resources, the empirical findings may vary. In this study, the concept used as entrepreneurship mainly concentrates on small business activities with a business model.

1.2. Turkey's Regional Development Efforts after 2000s

According to the National Dialogue on Entrepreneurship in USA, “an entrepreneur is an individual engaged in the process of starting and growing one’s own business”. Moving on from this point, entrepreneurship involves doing as well as knowing, taking personal and financial risk, utilizing innovation in technology or processes, marketing, and commitment to grow a business as fast as the market place allows. According to the European Union, “entrepreneurship is the mindset and process by which an individual or group identifies and successfully exploits a new idea or opportunity”.

OECD (2005) defines entrepreneurship as a job creation engine that has a positive impact on local, regional and national economies. New economic trends suggest that a prevalence of SMEs that provide a constant tide of new ideas and experimentation is a source that invigorates the health of the economy as a whole.

⁵ <https://dictionary.cambridge.org/tr/s%C3%B6z%C3%BCk/ingilizce/innovative> (access on Jan 15th, 2019).

⁶ Read more: <http://www.businessdictionary.com/definition/government-grant.html>

Regional development efforts and the encouragement of entrepreneurship have a long history in Turkey. Parallel to the OECD report released in 2005, Turkey's EU full membership process, which has been kicked off by the European Commission in 2004, led to the acceleration and facilitation of adopting decentralization policies. In this scope, regional policies have been employed to boost the local socioeconomic development. Establishment of regional development agencies has been a milestone for targeting regional policies. Rather than sticking with the 5-year National Development Plans, which is a one-size-fits-all concept, regions have started to have their own regional development plans, which comprises of their own regional priorities, sectors and goals.

In order to put regional development plans into practice, the Turkish government has been using financial instruments, aka projects grants. The grants are allocated to innovative projects of both for-profit (businesses/entrepreneurs) and not-for-profit organizations (i.e. NGOs, Public Institutions, Universities). Projects of such not-for-profit organizations even aim at founding a sustainable ecosystem for entrepreneurs. Thus, supporting entrepreneurial efforts on regionally specified areas and priorities has been a key element of the government since there is a concrete relationship between regional development and entrepreneurship. The percentage of SMEs comprises of 99.8% of all business in Turkey, according to the Ministry of Industry and Technology (2015). This ratio proves the importance of SMEs in the economy, especially in job creation, innovation and regional development.

Governmental bodies, not only in Turkey but around the world, are paying more attention to the financing of the innovative projects of entrepreneurs. They provide funding opportunities, which are aimed at assisting entrepreneurs to complete their projects and set up their businesses. After the establishment of development agencies in 2006, the Turkish government has put more emphasis on regional policies. While pointing out the government's response to such regional policies, the Ministry of Economy redesigned the concepts for incentives in 2012 (Cabinet Decision No. 2012/3305). While NUTS-II regions have their own regional policies, provinces (NUTS-III) have their own regionally supported sectors. Therefore, entrepreneurs have been designated to submit their innovative projects in the regionally supported sectors in order to benefit from incentives.

The major grant programs with the purpose of assisting entrepreneurial activities in Turkey involves development agency financial support programs, The Scientific and Technological Research Council of Turkey's (TUBITAK) Technology and Innovation Support Program (TEYDEB) and SME Development Organization of Turkey's (KOSGEB) entrepreneurship program. These financial support programs conducted by different institutions have different visions and focuses. TUBITAK grants are mainly designed for

R&D projects regardless of regions, whereas Development Agency programs attempt to cover regional priorities from an innovative perspective, especially in the commercialization process. KOSGEB, on the other hand, supports traditional industries.

Consequently, entrepreneurs with innovative ideas in Turkey have several options to finance their shortcomings of budgetary needs. Even though there is a sizable literature on the nexus of the effectiveness of government grants, many studies focus only on some region, rather than employing all the regions or cities. The case of Turkey, specifically, has studies based on either only one government grant mechanism or only one region. There are several studies on Turkey's incentive/grant programs: however, these studies neglect the analysis of the effectiveness and impact on regional development.

This paper is designed to fill the gap for employing each region and major entrepreneurial grant mechanisms aimed at stimulating entrepreneurship in the short and medium run, but also regional development in the long run. Furthermore, the impact of government grants on entrepreneurship will be explored; whether they generate economic development by encouraging entrepreneurial activities or not. After the introduction part, this study reviews related literature on the relationship between governmental grants and entrepreneurial activities (or new firm establishments). The third part lays out the theoretical framework, which runs through two major theories: Firm Theory and Microcredit Theory. The fourth part consists of the description of data, methodology and empirical results. The last part includes discussion and conclusion.

2. Literature Review on the Relationship between Governmental Grants and Entrepreneurship

In this section, studies with either similar methodological setups or focusing on regional data have been analyzed. The literature review comprises of several studies on various dependent and independent variables, where government grants, entrepreneurial activities, firm establishments, new firm birth rates and/or other indicators are included.

Compared to the vast number of papers investigating regional economic development, there is only a few studies analyzing the impact of government grants or incentives on entrepreneurship across regions. In this regard, this study intends to contribute to the regional development literature analyzing the impact of governmental grants on some economic indicators across regions/subregions.

Specifically, there are controversial outcomes when current literature is reviewed since some economists claim there are positive direct or side effects of government grant pro-

grams, but some claim the opposite. For instance, Yavan (2011) lists the studies with conflicting outcomes. Bartik (1992), Loh (1995), Goss and Phillips (1999), Schalk and Untiedt (2000) and Bondonio and Greenbaum (2007) have reached to positive results; whereas Ingram and Pearson (1981), Borello (1995), Fisher and Peters (1998) and Ayele (2006) assume that the grants have either no or incremental effect on economic growth.

Murray and Ullrich (2005) focused on finding a relationship between grants and economic growth at the county-level (50 counties) in Tennessee, USA in 1997-2002 time period, using a number of different measures of economic development. The conducted analysis finds little evidence about this relationship. There is some evidence that greater grants per capita are associated with increases in the growth rate of county jobs. However, greater grants per capita in the current year are associated with reduced per capita income growth in the subsequent year.

Blattman et al. (2014) studied a government program in Uganda designed to help the poor and unemployed become self-employed artisans, increase incomes, and thus promote social stability. Young adults in Uganda's conflict-affected north were invited to form groups and submit grant proposals for vocational training and business start-up. Relative to the control group, the program increases business assets by 57%, work hours by 17% and earnings by 38%. People benefitting from the program also formalize their enterprises and hire labor.

Another paper examining the relationship in question belongs to Yavan (2011). This paper's objective is to analyze the impacts of investment incentives on regional economic growth in Turkey. The model covers 81 provinces of Turkey for the year 2000. Empirical evidence from the model shows that as incentive-based investments of private sector increase in a province, both GDP and GDP per capita at regional level increase. Yavan (2012) extended his 2011 study and investigated the determinants of investment incentives at the regional level in Turkey during the period 2001-2008. These results suggest that incentives at regional level are determined not only by economic factors, but also by political and institutional factors.

More recently, Duran (2018) conducts a similar but narrowed study in Turkey's two different governmental support mechanisms. His study investigated the correlation between new firm birth rate, which is the ratio of newly established firms to the cumulative firm number in a region, and some exogenous variables including TUBITAK – TEYDEB grants and KOSGEB entrepreneurship grants. The empirical findings show that while TUBITAK TEYDEB incentives and the increase of per capita amount of bank deposit rate affect the entrepreneurship ecosystem positively, the increase of employment rate has a negative ef-

fect on the entrepreneurship performance as decreasing the number of new born companies. However, the data excludes development agency grants, which are one of the major governmental support mechanisms across Turkey's regions.

3. Theoretical Framework

Economic theory indicates that the decision of firms' entry and exit in a perfectly competitive market depends on their positive long-run profits which simply based on the difference between total revenue and total cost as large as possible. However, the positive relationship between firms' entries and profits is usually obstructed by limited funds and different forms of competitive structures. Particularly market conditions can change and many markets display imperfect competition conditions, which are a blend of monopoly and competition simultaneously. Firms become more interdependent the smaller the number of firms in the industry, the easier entry, and the closer the substitute goods available to consumers. When firms perceive their interdependence, they have an incentive to take account of their rivals' actions and to formulate their own plans strategically⁷.

As described by Jehle and Reny (2011) the above explanation on *firm theory* depends on profit maximization and it includes two rationales. The first one assumes that entrepreneur is both owner and manager of the firm and he/she tries to maximize firm's income without considering the market structure. If the entrepreneur does not find a positive relationship between his/her effort and profit then entrepreneur can try to find an optimal trade-off between effort and profit. That means they may not attain profit maximization but to maximize entrepreneurial utility.

Second rationale considers the competitive structure of market and profit maximization becomes a must for firms. In order to survive against its rivals in the market, profit maximization is a necessity. In other words, competition becomes important for firms' attitudes.

In order to maintain the current firms in the market and attract new firms into the market, governments apply incentive mechanism including grants, low-cost loans, and tax holidays and so on. In the last few decades many national and/or regional governments have paid increasing attention to use such mechanism to facilitate regional development.

When it comes to the theories of regional development, *the actor-network theory* (Sza-jnowska-Wysocka, 2009) explains a social world presented as a diverse network of relations and influences between different subjects – actors (entrepreneurs, local government)

⁷ Advanced Microeconomic Theory, Geoffrey A. Jehle and Philip J. Reny (2011), Pearson.

and objects (enterprises, communes, towns, economic regions). Based on this theory, major actors are the government and the entrepreneurs. Government either employs its institutions (e.g. TUBITAK, Development Agencies, KOSGEB) to allocate grants has macro targets in order to provide safe haven for current and potential entrepreneurs, such as increasing GDP per capita, creating jobs, lowering unemployment rate. Entrepreneurs are people; and the entrepreneurship level depends on both the demographic structure and the overall level of skills of the population.

Regarding entrepreneurship theories, Simpeh (2011) classifies them into six categories as economic, psychological, sociological, anthropological, opportunity-based and resource-based entrepreneurship theories. The *resource-based theory* (RBT) of entrepreneurship argues that access to resources by founders is an important predictor of opportunity based entrepreneurship and new venture growth (Alvarez & Busenitz, 2001). This theory stresses the importance of financial, social and human resources (Aldrich, 1999). Thus, access to resources enhances the individual's ability to detect and act upon discovered opportunities (Davidson & Honing, 2003). For the financial side, governments aim to close this gap by allocating grants. For the social environment, geographical or statistical regions play significant role since they involve larger or narrower network structure. For the human capital, the demographic specifications, education level, and even female labor participation rate may play a role.

On the other hand, there is a significant relationship between research-based entrepreneurship theories and the microcredit theory, which targets micro or small businesses to contribute to local economic development. In the proceeding part, the linkage between these two theories will be explored.

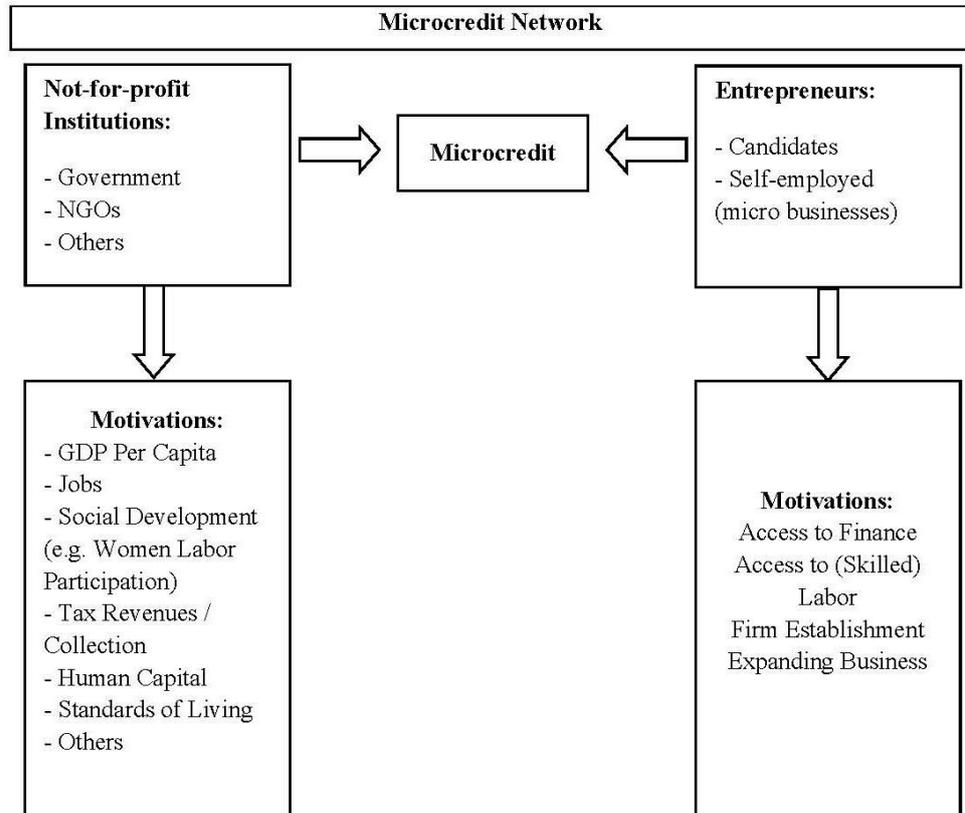
3.1. Linking Resource-Based Entrepreneurship Theories with Microcredit Theory

Microcredit theory has links with resource based entrepreneurship theories. Starting with the definition of microcredit theory is that it -broadly speaking, the provision of small loans (typically USD100 to USD500) to very small businesses, typically self-run enterprises with few if any employees - is an increasingly common weapon in the fight to reduce poverty and promote economic growth. The motivation for the continued expansion of microcredit, or at least for the continued flow of subsidies to both not-for-profit and for-profit lenders, is the presumption that expanding credit access is a relatively efficient way to fight poverty and promote growth (Karlan and Zinman, 2011). Such interventions may reflect positive effect of microcredit mechanisms on creating new jobs, reducing poverty through self-

employment and fostering entrepreneurship, which means more firms start operating in the market.

As stated above, these two major theories have intersecting areas. Alam (2013) states that microcredit programs, announced by not-for-profit institutions – mainly governmental - can affect profit via physical capital. Lack of collateral and high transaction costs of small loans often preclude the poor from normal sources of banking. When there is little access to credit, self-employment may never be undertaken or be held at a suboptimal level. Microcredit can provide credit with which households can purchase additional capital assets, thereby raising the level of capital. This enables households to undertake a new or expand an existing self-employment activity. To see more clearly, Alam considers the credit market and self-employment decisions before and after a microcredit intervention. Prior to the intervention, he assumes that households are in equilibrium. Some households engage in self-employment while others work in the wage labor market. Then a microcredit program locates in the village, offering credit to those lacking resources and lowering the price for credit. Given this situation, some households who were not operating self-employment now find it optimal to invest in a self-employment activity. Yet, others in self-employment may find it optimal to expand their business.

Table 1. Microcredit Network and Motivations of Actors



Source: Impact Analysis Survey, Istanbul Development Agency, 2020.

Table 1 shows a sample tabling of microcredit environment, where actors, tools and motivations are exhibited. Not-for-profit institutions' motivations for supplying microcredit mechanisms can be summarized as increasing GDP per capita, creating jobs, boosting social development, collecting more tax revenues, having a populations ornamented with higher human capital level, better standard of living and so on. The other side have two branches; potential and active entrepreneurs. Potential entrepreneurs reach out to microcredit tools to set up their businesses; whereas active entrepreneurs seek to expand their businesses. They both apply for these mechanisms to access to finance and labor.

In addition to the effect through physical capital, microcredit may also affect profit through human capital. Most programs bundle social development programs with the provi-

sion of credits. These provide human capital in areas such as literacy, empowerment, legal and political awareness, investment strategies, civil responsibilities, and vocational trainings. These can directly increase stock of human capital (Alam, 2013).

Consequently, the analyses in this paper will dominantly be related the microcredit theory. Moreover, other theories such as the actor-network-theory under regional development theories and resource based entrepreneurship theories under the broad topic of entrepreneurship theories will be benefited from. Therefore, the goal of this paper is to find variables that will capture the context of these theories.

4. Data, Methodology and Empirical Results

After laying out the theoretical background and selecting microcredit theory as its base, this study continues with the empirical analysis with a consideration of the data collected from various sources. The discussion is anticipated to conclude with the actual estimating equations and a presentation of other findings from regression analysis.

4.1. Research Hypothesis

According to Hulme (1997), "behind all microfinance programs is the assumption that intervention will change human behaviors and practices in ways that lead to the achievement (or raise the probability of achievement) of desired outcomes". In this research, hypotheses were used to test whether or not governmental grant programs designed to stimulate entrepreneurial activities lead to more firms and higher new firm birth rates. The objective of this study is to measure the impact of such financial programs on 26 NUTS-II regions of Turkey. In support of the research objective, the following specific hypotheses are investigated:

Null Hypothesis (H_0): Government grants allocated to boost entrepreneurial activities have significant effect on the establishment of new firms and new firm birth rate.

Alternative Hypothesis (H_A): Government grants allocated to boost entrepreneurial activities have significant effect on the establishment of new firms and new firm birth rate.

4.2. Data

A NUTS-II level database from 2010 to 2014 for Turkey was created using multiple data sources including, but not limited to, Turkish Statistical Institute, Banks Association of Turkey, Ministry of Finance, Development Agencies and Ministry of Development (Minis-

try of Industry and Technology since 2018). Table 2 introduces the major grant programs of the Turkish government supporting entrepreneurial activities.

Table 2. Major Grant Programs Designed to Stimulate Entrepreneurship

Grant Name	Responsible Organization	Description	Program Variation
Financial Support Programs	Development Agencies*	The program focuses in funding innovative projects of enterprises in order to foster regional economic development	Regional and Periodical
TEYDEB	TUBITAK	The program aims at funding Science, Technology and Innovation research of all private sector enterprises regardless of size and sector	Nationwide and Periodical
Entrepreneurship	KOSGEB	This is a two-step program. First step includes applied entrepreneurship training, and the second includes the application process. The program targets individuals to set up their own companies	Nationwide and Whole Year

Source: Istanbul Development Agency, KOSGEB, TUBITAK, 2018.

Recalling the grants programs; financial support programs of the development agencies focuses in funding innovative projects of enterprises in order to foster regional economic development. Entrepreneurs are free to apply only during the call for project proposal periods in the addressed sectors or themes. TUBITAK TEYDEB program aims at funding science, technology and innovation research of all private sector enterprises regardless of size and sector. KOSGEB’s entrepreneurship support is a two-step program. First step includes applied entrepreneurship training, and the second includes the application process. The program targets individuals to set up their own companies.

Data have been collected through different resources. The abbreviations of variables are shown in the following table⁸.

⁸ The description and sources of variables are shown in the Appendix.

Table 3. Variables*

Variables			
LNGPC	UNEMPRAT	FEMLBRPARTRT	LNSAVINGPC
LNNEWFRMNO	LNJOBS	LNELECCONS	LNTAXPC
NEWFRMBIRTHRT	EMPAGR	HGHSCHGRADRT	LNPRVTINV
LNGDPPC	EMPMAN	LESSDEV	LNFRGNINV
LNPOP	EMPSRV	LNGOVCAPINV	

*All numbers are adjusted through consumer price index (Base year: 2010); descriptions and sources of the abbreviated variables are shown in Appendix.

The grant programs shown in table 2 have been aggregated to single grant variable in our analysis since the magnitude of some of the individual grants is quite modest relative to the size of the regions' economies. Additionally, the data showed us that some regions did not benefit from some grant programs in some years. The cumulative numbers are assumed to display more meaningful reflection.

For the development agency financial support programs for enterprises, we have taken into consideration the year that the contracts were signed by the beneficiaries, rather than the announcement year. This mindset applies for TUBITAK TEYDEB and KOSGEB entrepreneurship supports, as well. For 8 observations out of 130, due to lack of real data, we have inserted announced or committed amounts by development agencies rather than the contractual amounts. Data of all grants have been directly provided by related governmental institution. The missing data have been completed through Annual Reports of Development Agencies and the Ministry of Development.

The collected data include the exogenous variables, which are grants per capita, gdp per capita, population, unemployment rate, employment numbers (jobs), employment share of agriculture, employment share of manufacturing, employment share of services, female labor participation rate, electricity consumption per capita, high school graduate rate, dummy variable representing less developed regions⁹, government capital expenditures per

⁹ According to the study of "Socioeconomic development rankings of provinces and regions SEGE-2011", State Planning Organization has classified provinces and regions into six categories; first category with the most developed, sixth category with the least developed.

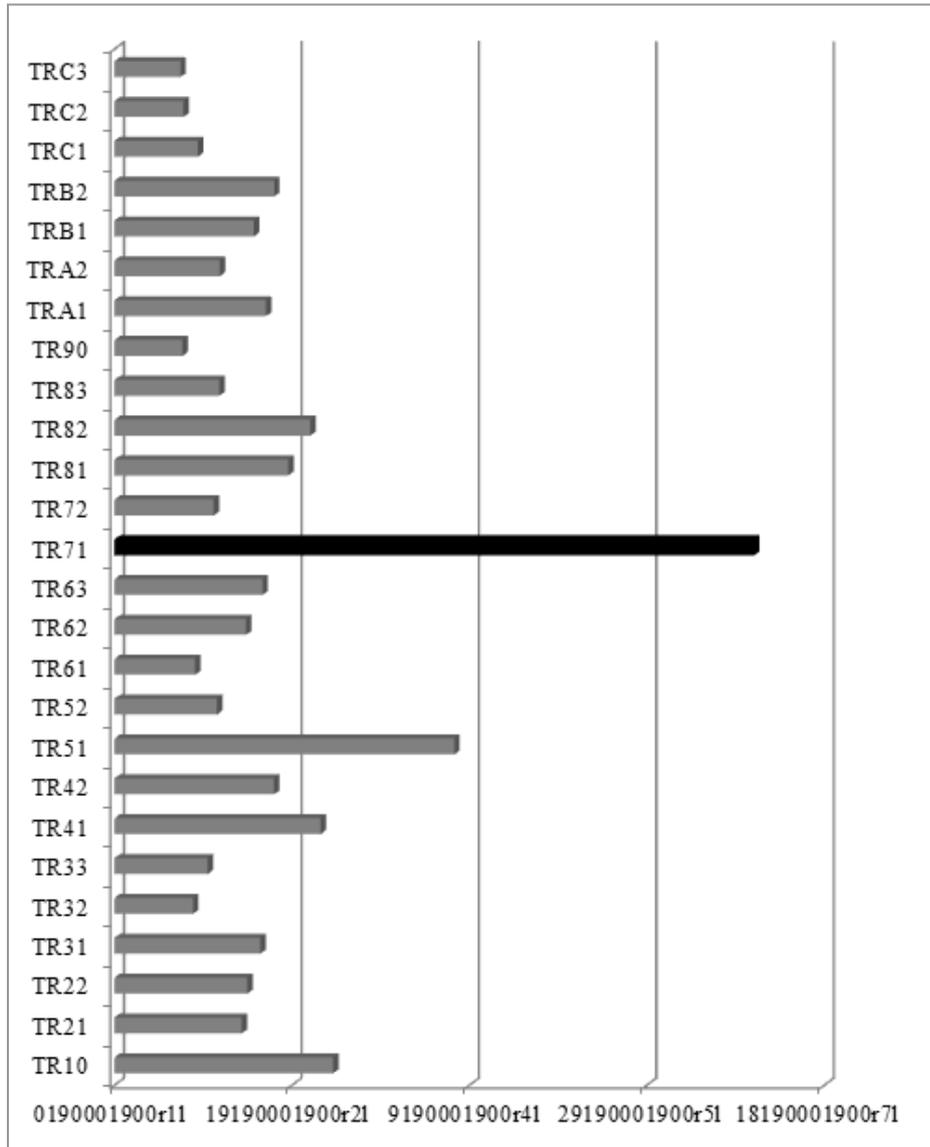
capita, gross tax revenues of government per capita and bank deposit (savings account) per capita. Regarding the dependent variables, the data involve percentage change in income per capita, percentage change in unemployment rate, percentage change in employment, number of newly established firms and new firm birth rate. All variables are adjusted with consumer price index, taking 2010 as the base year.

In this paper, we will be using panel data, which provide information on individual behavior, both across individuals and over time – they have both cross-sectional and time-series dimensions.

4.3. Descriptive Statistics

Going through data, the average grant received by NUTS-II regions between 2010 and 2014 was TRY26.7 million and ranged from a low of TRY19,762 in TR82 region (Kastamonu, Cankiri and Sinop) in 2010 to a high of TRY175.3 million in TR10 region (Istanbul) in 2011. Grant per capita, on the other hand, varies from a low of TRY0.0265975 in TR82 (Kastamonu, Cankiri and Sinop) region in 2010 to a maximum of TRY45.64799 in TR71(Kırıkkale, Aksaray, Niğde, Nevşehir, and Kırşehir) region in 2013. Regarding new firm establishments, the lowest figure again comes from TR82 (Kastamonu, Cankiri and Sinop) region in 2011 with 424 new firms, whereas there were 49,945 firms established in TR10 (Istanbul) in 2014. The capital Ankara has the highest new firm birth rate in 2010 (0.063055). TR82 (Kastamonu, Cankiri and Sinop) region is again having the lowest observation of 0.013388 in 2011.

TRC2 (Sanliurfa and Diyarbakir) and TRC3 (Mardin, Batman, Sirnak, and Siirt) regions have the lowest female labor participation rate with the means of 0.1098 and 0.0984, respectively. Regarding the top female participation rate, TR90 (Trabzon, Ordu, Giresun, Rize, Artvin, and Gümüşhane) has a 5-year mean of 0.4146. Please see Table 7 in Appendix for the full list of NUTS-II regions in Turkey.

Figure 1. Grants Per Capita Per Region in TRY (Cumulative for 2010-2014)

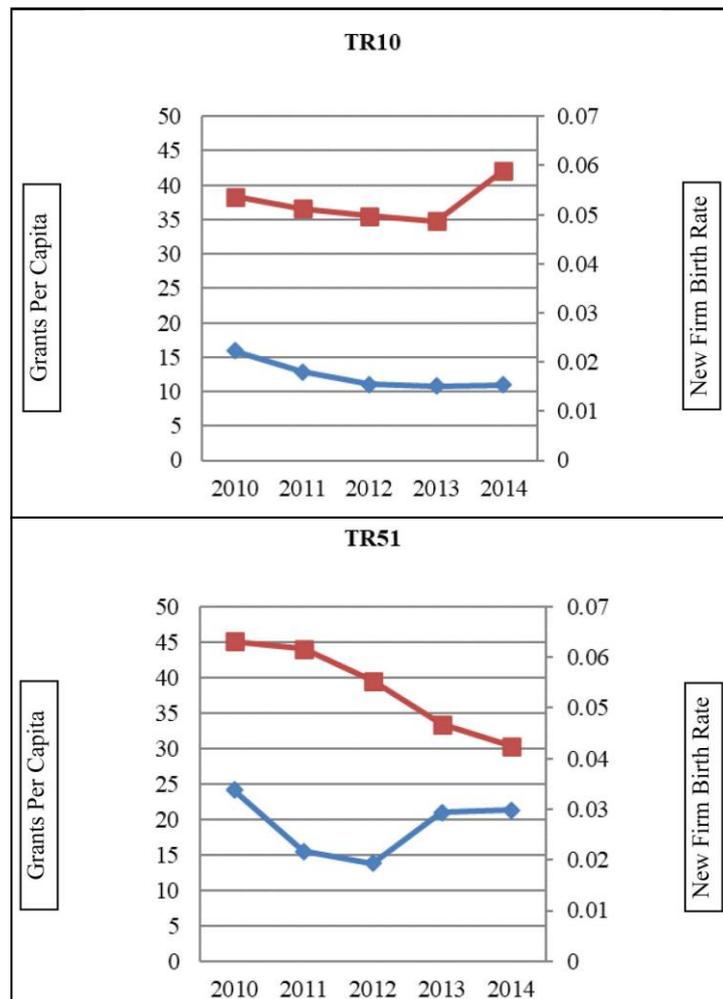
Source: KOSGEB, TUBITAK, Development Agencies (2010-2014)

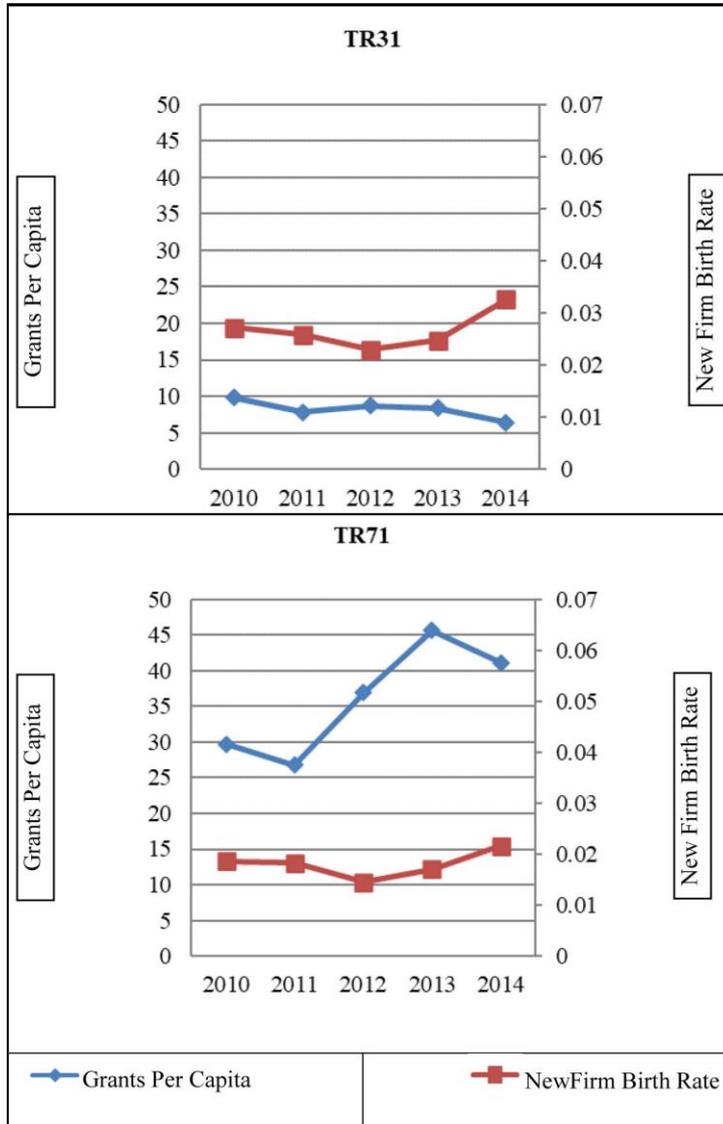
Figure 1 summarizes the cumulative grants per capita in TRY allocated across regions. TR71 region, which includes Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir provinces, have by far the highest grants per capita allocation, TRY 180.24, but only 0.018 of annual average new firm birth rate, among 26 NUTS-II regions in Turkey. TR51, Ankara, comes second with TRY 95.75 per capita grant in total but the highest annual average new firm birth

rate of 0.054. This means that there are other factors affecting the new firm birth rate other than the entrepreneurship grants allocated by various institutions.

Figure 2 exhibits the annual allocation of grants per capita versus new firm birth rate for selected NUTS-II regions in Turkey. It can be interpreted from the figure that less injection of entrepreneurship grants in Istanbul is followed by new firm birth rate ranging from 0.049 to 0.059. As emphasized in the previous paragraph, TR71 has the highest level of grants per capita but one of the lowest levels of new firm birth rate ranging from 0.015 to 0.022. This may lead researchers to question the effectiveness of grant mechanisms from an entrepreneurship perspective.

Figure 2. Grants Per Capita (TRY) vs New Firm Birth Rate (2010-2014) for Some Selected NUTS-II Regions in Turkey*





Source: TUBITAK, KOSGEB, Development Agencies, 2010-2014.

* TR10: Istanbul, TR31: Izmir, TR51: Ankara, TR71: Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir

4.4 Methodology

In this study, besides regular panel data models, backward stepwise regression will also be used. Backward stepwise regression is a stepwise regression approach that begins with a full (saturated) model and at each step gradually eliminates variables from the regression model to find a reduced model that best explains the data; which is also known as backward

elimination regression. The stepwise approach is useful because it reduces the number of predictors, reducing the multicollinearity problem and it is one of the ways to resolve the over-fitting.

The econometric model this paper uses include dependent and/or independent variables that consist of financial, social and human capital aspects, in line with the resource-based development theory. The model is also in line with the scope of microcredit theory, whose actors in its network and motivations are covered.

Consequently, the null hypothesis is that grant per capita has positive and significant effect on new firm establishment and new firm birth rate.

a. Fixed Effect Panel Model

The following stylized model of economic growth is being used:

$$Y_{it} = \alpha_i + \beta_1 LNGPC_{it} + \beta_2 X_{2it} + \dots + \beta_k X_{kit} + v_t + \delta_i + u_{it} \quad (01)$$

where Y_{it} is the dependent variable represents the number of new firms in the first regression and new firms birth rate in the second regression. The term X_{it} captures all time varying explanatory variables and $LNGPC_{it}$ is the natural logarithm of grants per capita ($LNGPC$) variable.

The constant term varies across regions through time ($t=1, 2, \dots, T$).

$$\alpha_{it} = \alpha_i$$

The coefficients for all units ($i:1, 2, \dots, N$) and time ($t=1, 2, \dots, T$) are constant.

$$\beta_{kit} = \beta_k \quad (k=2, 3, \dots, K) \quad (02)$$

Since every region has its own constant term, we may define the equation as follows.

$$Y_{it} = (\alpha_1 D_{1t} + \alpha_2 D_{2t} + \dots + \alpha_n D_{nt}) + \beta_1 LNGPC_{it} + \beta_2 X_{2it} + \dots + \beta_k X_{kit} + u_{it} \quad (03)$$

$i: 1, 2, \dots, 130$: Observations

$j: 1, 2, \dots, 10$: Independent Variables

$k: 1, 2, \dots, 26$: Regions

This study is explicitly interested in the effectiveness of government grants and also some other explanatory variables. In the model, some factors (v) are time dependent but don't vary across regions; and some variables (δ) are region dependent but don't vary over time. u_{it} is the idiosyncratic error term.

Putting grant per capita aside, the model captures a number of independent variables which may explain the regional economic activities including population, the share of jobs

in services sector, electricity consumption per capita, government capital expenditures per capita, tax collection per capita, and unemployment rate. Moreover, the analysis consist of social variables, which may be listed as female labor participation rate, high school graduate rate and the dummy of less developed regions.

There are the two dependent variables regressed through independent variables and the goal is to find any significant relationship between the dependent variables and the independent variables.

b. Stepwise Backward (Step-Down) Selection

In most cases, theory and experience may provide just the general framework and direction about which pool of candidate variables should be involved in a regression model. The actual set of predictor variables used in the final regression model must be determined by analysis of the data. Determining this subset is called the variable selection problem. The stepwise backward selection model starts with all candidate variables in the model. At each step, the variable that is the least significant is removed. This process continues until no nonsignificant variables remain. The user sets the significance level at which variables can be removed from the model¹⁰.

In this model, the independent variable “natural logarithm of grant per capita (LNGPC)” is locked in the each step, even it is not significant, since the objective is to compute the relationship between the grants allocated to entrepreneurs and new firm numbers or new firm birth rate.

If p value < 0.05 “keep variable”, if not “drop (the highest variable with the highest p -value first)”;

$$\text{Initial: } Y_{it} = \alpha_i + \beta_1 \text{LNGPC}_{it} + \dots + \beta_k X_{kit} + v_t + \delta_i + u_{it} \quad (04)$$

$$\text{Step 1: } Y_{it} = \alpha_i + \beta_1 \text{LNGPC}_{it} + \dots + \beta_{k-1} X_{kit} + v_t + \delta_i + u_{it} \quad (05)$$

$$\text{Step 2: } Y_{it} = \alpha_i + \beta_1 \text{LNGPC}_{it} + \dots + \beta_{k-2} X_{kit} + v_t + \delta_i + u_{it} \quad (06)$$

$$\text{Step n: } Y_{it} = \alpha_i + \beta_1 \text{LNGPC}_{it} + \dots + \beta_{k-n} X_{kit} + v_t + \delta_i + u_{it} \quad (07)$$

Our final forms after backward elimination:

$$\text{LNNEWFRMNO} = \alpha_i + \beta_1 \text{LNGPC}_{it} + \beta_2 \text{LNFRGNINV}_{it} + \beta_3 \text{EMPSRV}_{it} + \beta_4 \text{EMPMAN}_{it} + \beta_5 \text{LNSAVPC}_{it} + \beta_6 \text{LNJOBS}_{it} + v_t + \delta_i + u_{it} \quad (08)$$

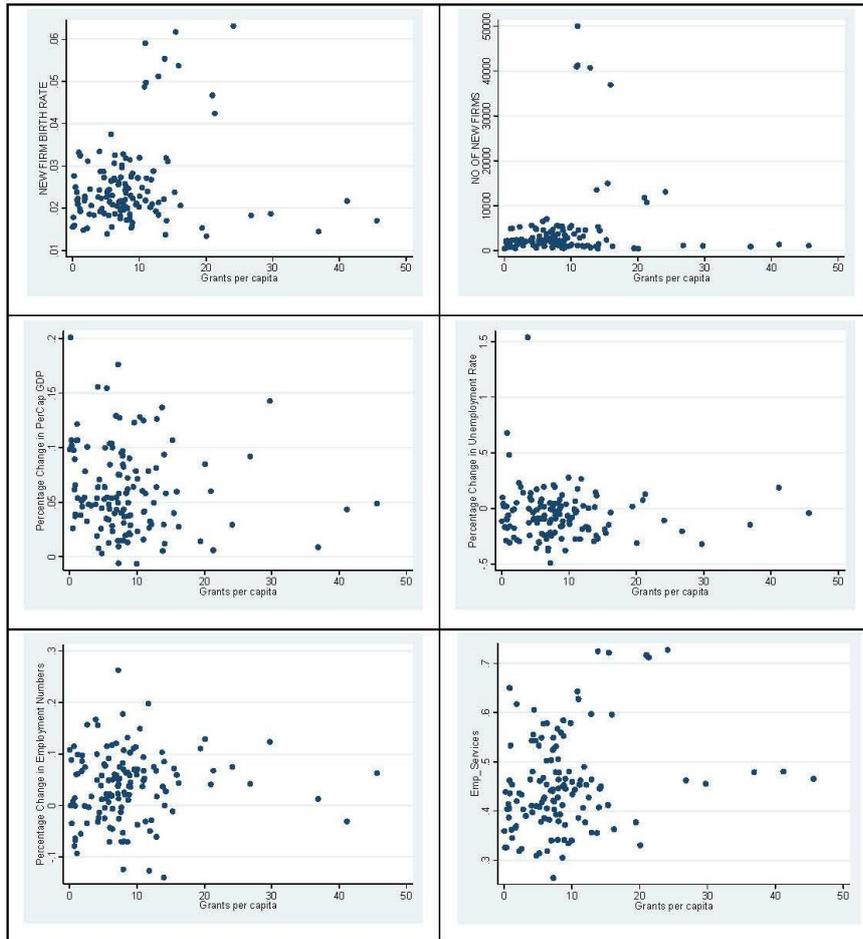
$$\text{NEWFRMBIRTHRT} = \alpha_i + \beta_1 \text{LNGPC}_{it} + \beta_2 \text{EMPSRV}_{it} + \beta_3 \text{HGHSCHGRADRT}_{it} + \beta_4 \text{LNSAVPC}_{it} + \beta_6 \text{LNJOBS}_{it} + v_t + \delta_i + u_{it} \quad (09)$$

¹⁰ https://ncss-wpengine.netdna-ssl.com/wp-content/themes/ncss/pdf/Procedures/NCSS/Stepwise_Regression.pdf (access on Dec 04, 2018)

4.5. Estimating Equations and Empirical Results

In this study, Stata Statistical Package 12.0 has been used for the regression analyses to link government grant programs to regional economic growth. Panel data models (Fixed-Effects Estimator, and Backward Elimination Process) will be used to observe the outcome. For the purpose of this paper we have assumed that grants are exogenous. It should be kept in mind that political factors may also play a role in the scope of grant programs. However, it is recognized that there may be endogeneity of grants, which may affect our findings.

The correlation coefficient is a measure of the strength of the relationship between two variables for the specific equation of best fit. For instance, if the equation of best fit is linear, a correlation coefficient close to 1 or -1 suggests that these two variables have a strong linear relationship. When checking on our data, grants per capita has slight positive relationship with new firms establishments, new firm birth rate, gdp per capita, employment share of services sector, high school graduate rates, deposits in saving accounts in banks and tax collection, whereas it has slight negative relationship with unemployment rates, less developed regions, and change in per capita income.

Figure 3. Scatterplots: Grants per capita vs. Some Variables

As seen in figure 3, grants per capita has weak uphill (positive) linear relationship with new firm birth rate, change in gdp per capita, change in unemployment rate and change in employment numbers. It can be interpreted from the scatterplot of new firm birth rate vs grants per capita that there is no exact or weak relationship. Regarding the share of employment in services sector vs grants per capita, there is again a positive relationship seen.

We should notice that our dummy variable capturing the less developed regions is omitted in the fixed effects model since it doesn't vary over time. That rho is the percent of the variation that is explained by individual specific effects. Higher rho value means that most variation is explained.

If the individual specific effects are fixed, then random effects estimator and fixed effects estimator of the coefficients will converge to different values. In this case fixed effects estimator will be used. However, if the individual specific effects are random, then the random effects estimator and fixed effects estimator of the coefficients will converge to the same value. This means that random effects estimator is more efficient. We run Hausman tests to decide on the model, and also to see the differences between the coefficients of different regression models. Higher p-values would lead us to random effects model, while lower p-values would lead us to fixed effects model.

Table 4 shows the results obtained from the regressions using each of the 2 dependent variables in Stata. In these specifications the grants per capita is significant in none of the two cases. The results indicate that any increase in the volume of per capita grants in the region would reflect no significant effect on the economy.

In the light of the results, the grants variable is shown to be insignificant in each of the two cases. Checking on the backward selection models where the variable grants per capita is forced to be involved in each scenario, fixed investments of firms with foreign capital through incentive certificates have a negative impact on the number of new company establishments. 1% increase in foreign investments can be interpreted as 0.016% decrease in new firm establishments. On the other hand, a 1% increase in the share of services sector employment, share of manufacturing sector employment, saving deposit per capita (in banks) and total employment are associated with 1.126%, 1.659%, 0.610% and 0.513% increase in new firm establishments, respectively.

Table 4. Regression Results

	<i>DEPENDENT VARIABLES</i>			
	LN NO OF NEW FIRMS		NEW FIRM BIRTH RATE	
	Fixed Effects	Backward Selection (LNGPC locked)	Fixed Effects	Backward Selection (LNGPC locked)
	b/t	b/t	b/t	b/t
LNGPC	-0.007 (-0.55)	-0.004 (-0.41)	-0/000 (-0.92)	-0.000 (-1.52)
LNFRGNINV	-0.013 (-1.73)	-0.016* (-2.27)	-0.000 (-1.38)	
LN GOVCAPINV	0.003 (0.05)		0.001 (0.58)	
EMPSRV	0.573 (1.18)	1.126** (3.08)	0.021 (1.44)	0.021* (2.26)
EMPMAN		1.659** (2.66)		
HGHSCHGRADRT	1.384 (0.34)		0.195 (1.59)	0.183* (2.08)
UNEMPRT	0.258 (0.38)		0.014 (0.71)	
LNSAVPC		0.610** (3.10)		0.015** (3.20)
LN ELECCONS	0.382 (1.75)		0.001 (0.14)	
FEMLBRPARTRT	0.016 (0.03)		-0.001 (-0.06)	
LN POP	1.883** (2.92)		-0.006 (-0.30)	
LNJOBS		0.513** (2.90)		
_cons	-23.402* (-2.58)	-4.776 (-1.92)	0.049 (0.18)	-0.141** (-3.18)
R-sqr	0.284	0.362	0.124	0.159
dfres	83	86	83	100
BIC	-180.1	-208	-1009.2	-1156.9

* p<0.05, ** p<0.01, *** p<0.001

B: coefficient T: t-stat

Regarding the new firm birth rate, which is the second dependent variable evaluated under the entrepreneurship concept, the share of employment in services sector, high school graduate rate, and saving deposit per capita (in banks) all have positive effects reflecting 0.021%, 0.183% and 0.015% increase on new firm birth rate, respectively, in response to a 1% rise for each variable.

In each model, governmental grants allocated to stimulate entrepreneurial activities have almost zero effect on both the number of new firm establishments and new firm birth rate; furthermore, they all have insignificant results.

Checking on multicollinearity, we will be using variance inflation factor (vif). If the vif value is higher than 5, this may lead us to multicollinearity with other variables (especially for the fixed and random effect models). Therefore, those variables should be dropped from the regression. The correlation matrix also helps us to get the essence of how to approach to multicollinearity. Table 5 shows us the variance inflation factor outcomes.

Table 5. Variance Inflation Factor

Variable	VIF	1/VIF
EMPSRV	3	0.332814
HGHSCHGRADRT	2.92	0.341925
LNPOP	2.16	0.463293
FEMLBPARTRT	2.09	0.478833
LNELECCONS	1.89	0.529945
UNEMPRT	1.85	0.541168
LNGOVCAPINV	1.64	0.611113
LNFRGNINV	1.59	0.628761
LNGPC	1.28	0.783089
Mean VIF	2.05	

5. Conclusion

For regional development, there has always been a need for entrepreneurs since they are the major players contributing to the economy in several dimensions including innovation, production and employment generation. In order to foster entrepreneurship, governments intervene to the economy directly or indirectly. Therefore, governments use mechanisms that positively affect the drivers of entrepreneurship.

Social scientists have been questioning how to handle the usage of governments' grant mechanisms. The direct injection of money into the hands of entrepreneurs with no reimbursement has recently been a concern in several countries including Turkey. In this paper, the effectiveness of governmental grant mechanism aimed at entrepreneurship has been analyzed across 26 NUTS-II regions between 2010 and 2014.

The analysis presented here finds no evidence that such grants are effective in promoting neither new firm establishment nor new firm birth rate, using a number of different measures of economic development. The insignificant results in this empirical analysis are surprising because the transfer of new resources into the economy is expected to create improved economic outcomes.

The insignificance results may stem from the wide spectrum of firms. TUBITAK and Development Agency support mechanism target innovative firms whereas KOSGEB is indifferent in the innovative capacity of firms. The results may promote researchers to check the significance in firm-level, rather than taking an overview snapshot.

As an interpretation of the empirical results, this study also intends to find what best explains the ineffectiveness of government grants to stimulate the level of entrepreneurship? There are surely several reasons. One explanation may be the grant itself. Since there is no requirement for reimbursement, entrepreneurs may see grants as free money. They opt to just use the incentive, acquire the machinery and equipment, but do not sustain their innovative status. Since the owners of firms are the sole decision makers, they select to stay as an SME, not to scale up or globalize. When just money is invested without the investors putting in any of their know-how or time, it is called "dumb money"¹¹. It is a mostly regarded that Turkish entrepreneurs see government grants as dumb money.

Grant mechanisms are one of the foremost tools of governments in the context of entrepreneurship and regional development. As for future study, the model in this paper could be

¹¹ Market Business News, <https://marketbusinessnews.com/financial-glossary/smart-money/>, access on May 04, 2018.

expanded to analyze “how to make firms/entrepreneurs more effective?” Venture capital is a similar financial mechanism for entrepreneurs with one exception. Here, investors do not only inject money, but also intervene in the decision-making process. Partal (2015) introduces a scheme, which consists of development agencies, international financial institutions, commercial banks and venture capital funds. Being involved in an ecosystem with a “fund of funds” role with key sectors and ratios to be invested, Partal proposes that development agencies may play a key role since they know the regional dynamics and featured sectors.

Saving rate is a key factor that positively affects entrepreneurship. As the bank deposits in saving account rises, this creates a positive scenario for the candidate-entrepreneurs. Banks would possess sufficient amount of deposits, and supply low cost loans to new entrepreneurs to enter the market or SMEs to grow their businesses.

Share of employment in services sector has a positive effect on the entrepreneurial activities. Firms in services sector are usually SMEs when compared to the manufacturing firms that are mostly in medium or large size. The ease of starting a services sector company stimulates the number of new firm birth rate. Education plays a significant role for entrepreneurs. People with solid educational background and knowledge about project management may be interpreted as the ones with more entrepreneurial capabilities.

Similar to the results of Martinez-Fierro et al. (2016), authorities targeting innovation-driven economic development design policies to ease access to physical infrastructure, R&D transfer and government support programs for innovation and SME activities. Increasing the number of small businesses that concentrate on innovation in the pre-determined regional sectors and priorities is expected to make a positive impact on regional development. As stated by Gonzalez et al. (2010), such government programs encourage innovative behavior in entrepreneurs and help a country or a region to move up from efficiency-driven economy to innovation driven economy in the long run.

References

- ACS, Z. J. and SZERB, L. (2007), "Entrepreneurship, Economic Growth and Public Policy", *Small Business Economics*, Vol. 28, No. 2/3 (Mar.), pp. 109-122.
- ALAM, S. (2013), "The Impact of Credit and Non-Credit Aspects on Self-Employment Profit: A Comparison of Microcredit Programs and Commercial Lenders in Rural Bangladesh", *The Journal of Developing Areas*, Vol. 47 (1) (Spring), pp. 23-45.
- ALDRICH, H. E. (1999), *Organisations Evolving*, Sage Publications.
- ALVAREZ, S. and BUSENITZ, L. (2001), "The Entrepreneurship of Resource Based Theory", *Journal of Management*, Vol. 27, pp. 755-775.
- AYELE, S. (2006), "The Industry and Location Impacts of Investment Incentives on SME's Start-up in Ethiopia", *Journal of International Development*, Vol. 18, pp. 1-13.
- BARTIK, T. J. (1992), "The Effects of State and Local Taxes on Economic Development: A Review of Recent Research", *Economic Development Quarterly*, Vol.6 (1), pp. 102-110.
- BLATTMAN, C., FIALA, N., and MARTINEZ S. (2014), "Generating Skilled Self-Employment in Developing Countries: Experimental Evidence from Uganda", *The Quarterly Journal of Economics*, pp. 697-752.
- BONDONIO, D. and GREENBAUM, R. T. (2007), "Do Local Tax Incentives Affect Economic Growth? What Mean Impacts Miss in the Analysis of Enterprise Zone Policies", *Regional Science and Urban Economics*, Vol. 37, pp. 121-136.
- BORELLO J. A. (1995), "Regional Development and Industrial Promotion in Argentina: A Review of Events and Writings", *International Journal of Urban and Regional Research*, Vol. 19 (4), pp. 576-592.
- BOURLÈS, R. and COZARENCO, A. (2014), "State Intervention and the Microcredit Market: The Role of Business Development Services", *Small Business Economics*, Vol. 43 (4), Special Issue: Firm Growth and Innovation (Dec.), pp. 931-944.
- DAVIDSON, P. and HONING, B. (2003), "The Role of Social and Human Capital among Nascent Entrepreneurs", *Journal of Business Venturing*, Vol. 20, p. 121.
- CARD, J. (2015), "Free Money? How to Access Government Grants", *The Guardian*, <https://www.theguardian.com/small-business-network/2015/apr/16/free-money-access-government-grants-business> (access on Jan 15th, 2019).
- CHEN, C. C. (2014), "Entrepreneurship, Economic Growth, and Employment: A Case Study of Taiwan", *Hitotsubashi Journal of Economics*, Vol. 55 (1) (June), pp. 71-88.
- DOGAN, C. (2011), "II. Mahmut Dönemi Osmanli Merkezilesme Politikasinin Dogu

- Vilayetlerinde Uygulanması”, *Turkish Studies - International Periodical For the Languages, Literature and History of Turkish or Turkic*, Vol. 6/4 (Fall), pp. 505-521.
- DUCH, N., MONTOLIO, D., and MEDIAVILLA, M. (2007), “Evaluating the Impact of Public Subsidies on a Firm’s Performance: A Quasi-Experimental Approach”, *Institut d’Economia de Barcelona*, Document de Treball, Vol.3, pp.1-29.
- DURAN, H. (2018), “Türkiye’de Devletin Girişimcilik Destekleri ve Seçilmiş Bazı Değişkenlerin Yeni Firma Doğum Oranı Üzerine Etkisi”, *Journal of Research in Economics, Politics & Finance*, Vol. 3(1), pp. 68-85.
- European Investment Fund, <http://www.eif.org/> (access on Jan 15th, 2019).
- European Union, “Regional Policy”, https://europa.eu/european-union/topics/regional-policy_en (access on Jan 15th, 2019).
- FAINI, R. and SCHIANTARELLI, F. (1987), “Incentives and Investment Decisions: The Effectiveness of Regional Policy”, *Oxford Economic Papers*, New Series, Vol. 39, No. 3 (Sep., 1987), pp. 516-533.
- FERNHOLZ, T. (2015), “The World Bank Says Giving Money to Entrepreneurs Might Be The Best Jobs Program”, *Quartz*, <https://qz.com/516040/the-world-bank-says-giving-money-to-entrepreneurs-might-be-the-best-jobs-program/> (access on Jan 15th, 2019).
- FISHER, P. S. and PETERS, A. H. (1998), “Industrial Incentives: Competition Among American States and Cities”, *W. E. Upjohn Institute for Employment Research*, Kalamazoo.
- FRUG, G. E. (2002), “Beyond Regional Government”, *Harvard Law Review*, Vol. 115, No. 7 (May), pp. 1763-1836.
- GONZALEZ, J. L., JUNG, A., GONZALEZ, J. L., PENA, I., and ANYADIKE DANES, M. (2010), “Innovation-oriented start-ups in Latin American economies”, *Fourth Global Entrepreneurship Monitor Research Conference*, Sep. 30 – Oct. 2, London, UK.
- GOSS, E.P. and PHILLIPS, J. M. (1999), “Do Business Tax Incentives Contribute to a Divergence in Economic Growth”, *Economic Development Quarterly*, Vol. 13 (3), pp. 217-228.
- GU, Q., KAROLY, L. A., and ZISSIMOPOULOS, J. (2008), “An Analysis of What They Are, How Well They Perform, and How We Can Learn More about Them”, *Small Business Assistance Programs in the United States*, Kauffman-RAND Institute for Entrepreneurship Public Policy.
- HULME, D. (1997), "Impact Assessment Methodologies for Microfinance: A Review", *Paper prepared for CGAP’s Working Group on Impact Assessment*, Washington, D. C.
- INGRAM, W. and PEARSON, S. (1981), “The Impact of Investment Concessions on the

Profitability of Selected Firms in Ghana”, *Economic Development and Cultural Change*, Vol. 29 (4), pp. 831-839.

Istanbul Development Agency (2020), Impact Analysis Survey, Istanbul.

JEHLE, G. and RENY, P. J. (2011), *Advanced Microeconomic Theory*, Pearson.

KANNEBLEY Jr., S., SEKKEL, J. V., and ARAÚJO, B. C. (2010), “Economic performance of Brazilian manufacturing firms: a counterfactual analysis of innovation impacts”, *Small Business Economics*, Vol. 34, No. 3, pp. 339-353.

KARLAN, D. and ZINMAN, J. (2011), “Microcredit in Theory and Practice: Using Randomized Credit Scoring for Impact Evaluation”, *American Association for the Advancement of Science - New Series*, Vol. 332 (6035) (June 10th), pp. 1278-1284.

KOBI AS (2011), “*Girisim Sermayesi – Presentation*”, Bolgesel Gelismenin Finansmaninda Girisim Sermayesinin Rolu Sempozyumu, Ankara Development Agency, Ankara.

KOCH, Meinrad (2015), “Crossing the Valley of Death: Exploring Commercialization of Food Startups in Switzerland”, *Master Thesis*, Zurich University.

LISTER, K. (2011), “The Myth of Government Grants”, *Entrepreneur*, <https://www.entrepreneur.com/article/218135> (access on Jan 15th, 2019).

LOH, E. S. (1995), “The Effects of Jobs-Targeted Development Incentive Programs”, *Growth and Change*, Vol.24, pp. 365-383.

MADEN, S. I. (2012), “KOSGEB General Support Programme on Firms’ Performance: Case of Lake District”, *PhD Thesis*, Suleyman Demirel University.

MARTINEZ-FIERRO S., BIEDMA-FERRER, J. M., and RUIZ-NAVARRO, J. (2016), “Entrepreneurship and Strategies for Economic Development”, *Small Business Economics*, Vol. 47, No.4, pp. 835-851.

MCKENZIE, D. (2015), “Identifying and Spurring High-Growth Entrepreneurship Experimental Evidence from a Business Plan Competition”, *Policy Research Working Paper 7391*, World Bank.

Ministry of Industry and Technology of Turkey (2015), “SME Strategy and Action Plan 2015-2018”, Ankara.

National Dialogue on Entrepreneurship, USA, News 12/11/2004.

NCSS Statistical Software, “Stepwise Regression”, *Chapter 311*, pp. 01-09.

Organisation for Economic Co-operation and Development (OECD) (2005), “A Framework for the Development and Financing of Dynamic Small and Medium Sized Enterprises in Turkey”, <https://www.oecd.org/turkey/35645635.pdf> (access on Jan 26th, 2019).

- Organisation for Economic Co-operation and Development (OECD), “Development”, <http://www.oecd.org/development/> (access on Jan 15th, 2019).
- Organisation for Economic Co-operation and Development (OECD), “Regional Development Policy”, <http://www.oecd.org/cfe/regional-policy/regionaldevelopment.htm> (access on Jan 15th, 2019).
- Organisation for Economic Co-operation and Development (OECD), “SMEs and Entrepreneurship”, <http://www.oecd.org/industry/smes/> (access on Jan 15th, 2019).
- PARTAL, M. O. (2015), “Entrepreneurship and Venture Capital in Turkey: Government’s Role and an Intuitive Model”, *3rd International Regional Development Conference*, Conference Proceedings, pp. 269-286.
- PATEL, P. (2014), “Effectiveness of Entrepreneurship Development Interventions for Women Entrepreneurs: An ILO-WED Issue Brief”, *Women’s Entrepreneurship Development Program*, Small and Medium Enterprises Unit (SME) Enterprises Department, International Labor Organization.
- PLESS, J. (2017), “Is Government Funding for Innovation Effective, and How Can We Spend It Wisely?”, *News Opinion*, Oxford Martin School, <https://www.oxfordmartin.ox.ac.uk/opinion/view/362> (access on Jan 15th, 2019).
- ROCHA, H. O. (2004), “Entrepreneurship and Development: The Role of Clusters”, *Small Business Economics*, Vol. 23, No. 5 (Dec.), pp. 363-400.
- SCHALK, H. J. and UNTIEDT, G. (2000), “Regional Investment Incentives in Germany: Impacts on Factor and Growth”, *Annals of Regional Science*, Vol. 34, pp. 173-195.
- SCHUMPETER, J. A. (1911 & 1934), “The Theory of Economic Development”, *Harvard University Press*, Cambridge, MA.
- SCHUMPETER, J. A., Becker, M. C., and Knudsen, T. (2005), “Development”, *Journal of Economic Literature*, Vol. 43, No. 1 (Mar., 2005), pp. 108-120.
- Scientific and Technological Research Council of Turkey (TUBITAK) (2007), http://www.tubitak.gov.tr/tubitak_content_files/english/TUBITAKcatalogue.pdf (access on Jan 15th, 2019).
- SIMPEH, K. N. (2011), “Entrepreneurship theories and Empirical research: A Summary Review of the Literature”, *European Journal of Business and Management*, Vol. 3 (6), pp. 01-08.
- SME Development Organization of Turkey (KOSGEB), <http://en.kosgeb.gov.tr/site> (access on Jan 15th, 2019).
- State Planning Organization (DPT) (2013), “İllerin ve Bölgelerin Sosyo-Ekonomik Gelişmişlik Sıralaması Araştırması”, *Bölgesel Gelişme ve Yapısal Uyum Genel Müdürlüğü*, Ankara.

- SZAJNOWSKA-WYSOCKA, A. (2009), “Theories of Regional and Local Development – Abridged Review”, *Bulletin of Geography Socioeconomic Series*, No. 12, pp. 75-90.
- TOKTAS, Y., SEVINC H., and BOZKURT, E. (2013), “The Evolution of Regional Development Agencies: Turkey Case”, *Annales Universitatis Apulensis Series Oeconomica*, Vol. 15 (2), pp.670-681.
- TOSUN, M. S. and YILMAZ, S. (2010), “Decentralization, Economic Development, and Growth in Turkish Provinces”, *Emerging Markets Finance & Trade*, Vol. 46, No. 4 (July-August), pp. 71-91.
- TUOMI, K. (2012), “Best Practice in Attracting Investment”, *Review of Investment Incentives*, International Growth Center, Ref. No. F-41003-ZMB-1.
- World Bank (2018), “Regional Private Sector Development Strategies”, <http://www1.worldbank.org/publicsector/decentralization/topic6.htm> (access on Dec 08th, 2018).
- WREN, C. (2005), “Regional Grants: Are They Worth It?”, *Fiscal Studies*, Vol. 26, No. 2 (June), pp. 245-275.
- YAVAN, N. (2011), “Teşviklerin Bölgesel Ekonomik Büyüme Üzerindeki Etkisi: Ampirik Bir Analiz”, *Ekonomik Yaklaşım*, Vol. 22 (81), pp. 65-104.
- YAVAN, N. (2012), “Türkiye’de Yatırım Teşviklerinin Bölgesel Belirleyicileri: Mekânsal ve İstatistiksel Bir Analiz”, *Cografî Bilimler Dergisi*, Vol.10 (1), pp. 09-37
- YESİLADA, B. A. (2002), “Turkey's Candidacy for EU Membership”, *Middle East Journal*, Vol. 56, No. 1 (Winter), pp. 94-111.
- Law No. 4274 the Village Schools and Institutions Organization Law
- Law No. 5449 Law on the Establishment and Duties of Development Agencies.

Appendix

Table A1. Description and Sources of Data*

Variable	Description	Source
LNGPC	Natural Logarithm of the total contracted amount of government grants specifically aimed at entrepreneurial activities and allocated to the projects of for-profit companies and/or individuals (per capita in TRY)	Ministry of Industry and Technology (formerly known as the Ministry of Development), Development Agencies, TUBITAK, KOSGEB
LNNEWFRMNO	Natural Logarithm of Number of New Firms Established	Union of Chambers and Commodity Exchanges of Turkey
NEWFRMBIRTHRT	The ratio of new firms to total firms in that specific year	Union of Chambers and Commodity Exchanges of Turkey
LNGDPPC	Natural Logarithm of Per Capita Gross Domestic Product in TRY	Turkstat
LNPOP	Natural Logarithm of address based census population	Turkstat
UNEMPRATE	Labor force status by non-institutional population [15 years+] : Unemployment rate (%)	Turkstat
LNJOBS	Natural Logarithm of Total Employment by age group (15 years+) (thousand)	Turkstat
EMPAGR	Employment by economic activity (NACE Rev. 2) [15 years+] : Agriculture (%)	Turkstat
EMPMAN	Employment by economic activity (NACE Rev. 2) [15 years+] : Industry (%)	Turkstat
EMPSRV	Employment by economic activity (NACE Rev. 2) [15 years+] : Service (%)	Turkstat
FEMLBRPARTRT	Female Labor Participation Rate (age group 15 years+)	Turkstat
LNELECCONS	Natural Logarithm of per capita electricity consumption across regions (kWh)	Turkstat
HGHSCHGRADRT	Proportion of high school or vocational school graduates to Total	Turkstat

Variable	Description	Source
LESSDEV	If the region is coded as TRA1, TRA2, TRB1, TRB2, TRC1, TRC2, TRC3 by Turkstat, then labeled as less developed (1=Yes)	Turkstat
LNGOVCAPINV	Natural Logarithm of the distribution of public investments (thousand TRY) - Per Capita	Ministry of Industry and Technology (formerly known as the Ministry of Development)
LNSAVINGPC	Natural Logarithm of Per Capita Saving Deposits in TRY	The Banks Association of Turkey
LNTAXPC	Natural Logarithm of Per Capita Tax Revenues in TRY levied within General Budget	Directorate General of Public Accounts
LNPRVTINV	Natural Logarithm of Gross Fixed Investment (e.g. Physical Equipment and Accessories) by Private Sector in thousand TRY.	Turkstat
LNFRGNINV	Natural Logarithm of the Total Amount of Fixed Investments in million TRY thru incentive certificates obtained by firms with foreign capital	Ministry of Industry and Technology (formerly known as the Ministry of Development)

*All numbers are adjusted through consumer price index (Base year: 2010)

Table A2. Nomenclature of Territorial Units for Statistics in Turkey*

NUTS-1	NUTS-2	NUTS-3
Istanbul Region (TR1)	Istanbul Subregion (TR10)	Istanbul Province (TR100)
West Marmara Region (TR2)	Tekirdağ Subregion (TR21)	Tekirdağ Province (TR211)
		Edirne Province (TR212)
		Kırklareli Province (TR213)
	Balıkesir Subregion (TR22)	Balıkesir Province (TR221)
		Çanakkale Province (TR222)
Aegean Region (TR3)	Izmir Subregion (TR31)	İzmir Province (TR310)
	Aydın Subregion (TR32)	Aydın Province (TR321)
		Denizli Province (TR322)
		Muğla Province (TR323)
	Manisa Subregion (TR33)	Manisa Province (TR331)
		Afyonkarahisar Province (TR332)
		Kütahya Province (TR333)
		Uşak Province (TR334)
	East Marmara Region (TR4)	Bursa Subregion (TR41)
Eskişehir Province (TR412)		
Bilecik Province (TR413)		
Kocaeli Subregion (TR42)		Kocaeli Province (TR421)
		Sakarya Province (TR422)
		Düzce Province (TR423)
		Bolu Province (TR424)
		Yalova Province (TR425)

NUTS-1	NUTS-2	NUTS-3
West Anatolia Region (TR5)	Ankara Subregion (TR51)	Ankara Province (TR510)
	Konya Subregion (TR52)	Konya Province (TR521)
		Karaman Province (TR522)
Mediterranean Region (TR6)	Antalya Subregion (TR61)	Antalya Province (TR611)
		Isparta Province (TR612)
		Burdur Province (TR613)
	Adana Subregion (TR62)	Adana Province (TR621)
		Mersin Province (TR622)
	Hatay Subregion (TR63)	Hatay Province (TR631)
		Kahramanmaraş Province (TR632)
		Osmaniye Province (TR633)
	Central Anatolia Region (TR7)	Kırıkkale Subregion (TR71)
Aksaray Province (TR712)		
Niğde Province (TR713)		
Nevşehir Province (TR714)		
Kırşehir Province (TR715)		
Kayseri Subregion (TR72)		Kayseri Province (TR721)
		Sivas Province (TR722)
		Yozgat Province (TR723)

NUTS-1	NUTS-2	NUTS-3	
West Black Sea Region (TR8)	Zonguldak Subregion (TR81)	Zonguldak Province (TR811)	
		Karabük Province (TR812)	
		Bartın Province (TR813)	
	Kastamonu Subregion (TR82)	Kastamonu Province (TR821)	
		Çankırı Province (TR822)	
		Sinop Province (TR823)	
	Samsun Subregion (TR83)	Samsun Province (TR831)	
		Tokat Province (TR832)	
		Çorum Province (TR833)	
		Amasya Province (TR834)	
	East Black Sea Region (TR9)	Trabzon Subregion (TR90)	Trabzon Province (TR901)
			Ordu Province (TR902)
Giresun Province (TR903)			
Rize Province (TR904)			
Artvin Province (TR905)			
Gümüşhane Province (TR906)			
Northeast Anatolia Region (TRA)	Erzurum Subregion (TRA1)	Erzurum Province (TRA11)	
		Erzincan Province (TRA12)	
		Bayburt Province (TRA13)	
	Ağrı Subregion (TRA2)	Ağrı Province (TRA21)	
		Kars Province (TRA22)	
		Iğdır Province (TRA23)	
		Ardahan Province (TRA24)	

NUTS-1	NUTS-2	NUTS-3
Central East Anatolia Region (TRB)	Malatya Subregion (TRB1)	Malatya Province (TRB11)
		Elazığ Province (TRB12)
		Bingöl Province (TRB13)
		Tunceli Province (TRB14)
	Van Subregion (TRB2)	Van Province (TRB21)
		Muş Province (TRB22)
		Bitlis Province (TRB23)
		Hakkâri Province (TRB24)
Southeast Anatolia Region (TRC)	Gaziantep Subregion (TRC1)	Gaziantep Province (TRC11)
		Adıyaman Province (TRC12)
		Kilis Province (TRC13)
	Şanlıurfa Subregion (TRC2)	Şanlıurfa Province (TRC21)
		Diyarbakır Province (TRC22)
	Mardin Subregion (TRC3)	Mardin Province (TRC31)
		Batman Province (TRC32)
		Şırnak Province (TRC33)
		Siirt Province (TRC34)

*Defined in 2002 in agreement between Eurostat and the Turkish counterparts, Turkey's NUTS classifications are called statistical regions.