

**REPUBLIC OF TÜRKİYE  
YILDIZ TECHNICAL UNIVERSITY  
GRADUATE SCHOOL OF SOCIAL SCIENCES  
DEPARTMENT OF ECONOMICS  
PhD PROGRAM IN ECONOMICS**

**PhD DISSERTATION**



**THREE ESSAYS ON  
REGIONAL DEVELOPMENT**

**MEHMET ONUR PARTAL  
15729013**

**ADVISOR  
Prof. Dr. FERİDE GÖNEL**

**ISTANBUL  
2022**

**REPUBLIC OF TÜRKİYE  
YILDIZ TECHNICAL UNIVERSITY  
GRADUATE SCHOOL OF SOCIAL SCIENCES  
DEPARTMENT OF ECONOMICS  
PhD PROGRAM IN ECONOMICS**

**PhD DISSERTATION**



**THREE ESSAYS ON  
REGIONAL DEVELOPMENT**

**MEHMET ONUR PARTAL  
15729013  
ORCID NO: 0000-0003-4037-0201**

**ADVISOR  
Prof. Dr. FERİDE GÖNEL**

**ISTANBUL  
2022**

**REPUBLIC OF TÜRKİYE  
YILDIZ TECHNICAL UNIVERSITY  
GRADUATE SCHOOL OF SOCIAL SCIENCES  
DEPARTMENT OF ECONOMICS  
PhD PROGRAM IN ECONOMICS**

**PhD DISSERTATION**

**THREE ESSAYS ON  
REGIONAL DEVELOPMENT**

**MEHMET ONUR PARTAL  
15729013**

**Tezin Savunulduğu Tarih: 06 / 06 / 2022**

**Tez, oybirliği ile kabul edilmiştir.**

**Unvan Ad Soyad**

**Tez Danışmanı : Prof. Dr. Feride GÖNEL**  
**Jüri Üyeleri : Prof. Dr. Hüseyin TAŞTAN**  
**Prof. Dr. Ferda HALICIOĞLU**  
**Prof. Dr. Hüseyin KAYA**  
**Doç. Dr. Tolga AKSOY**

**ISTANBUL  
JUNE, 2022**

## ÖZ

### BÖLGESEL KALKINMA ÜZERİNE ÜÇ MAKALE

Mehmet Onur Partal

Haziran, 2022

Bu tez, üç makaleden oluşmaktadır: “Türkiye’de Kamu Hibe Mekanizmalarının Etkinliği: Girişimcilik ile Kurulan Bağlantı”, “Etki Değerlendirmesi Açısından İmalat Sanayiinde Mali Destekler ve KOBİ Performansı”, ve son olarak “Ekonomik Kalkınma Perspektifinden Startup Performansı: Fon (Yatırım) Safhasının Ardından Etki Değerlendirmesi”.

İlk makalede girişimcilik alanında kamunun verdiği desteklerin olası bölgesel etkileri analiz edilmektedir. 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 sorgulanır hale gelmiştir. Bu makalede, sabit etkiler ve stepwise-backward selection ekonometrik modelleri aracılığıyla TÜBİTAK Teydeb, KOSGEB ve Kalkınma Ajanslarının girişimcilere yönelik 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 mekanizmalarının türlerine ve miktarlarına göre yeni çalışmaların yapılmasına ihtiyaç duyulduğu ortaya çıkmaktadır.

İkinci makale, kamunun verdiği desteklerin KOBİ bazında incelenmesi ve bunun etki değerlendirme perspektifinden sonuçlarının araştırılmasına odaklanmaktadır. Son on yılda, her ne kadar kamu hibe mekanizmalarının sayısı artıyor ve kapsamı genişliyor olsa da bu desteklerin kontrol grup oluşturularak firmalar üzerindeki etki değerlendirmesinin yapılması ve etkisinin araştırılmasına yönelik çalışmalar kısıtlı sayıda kalmıştır. Bu çalışmada, kamudan destek almış deney grubu ile kontrol grubu etki değerlendirme yapılarak analiz edilmektedir. Farkların farkı yöntemi aracılığıyla imalat sanayiinde faaliyet gösteren KOBİ statüsündeki firmaların istihdam, ortalama işgücü maliyeti, kar, katma değer ve ihracat hacimleri karşılaştırılmaktadır. Sonuçlar göstermektedir ki destek alan firmaların performansı aslında ilk başta amaçlanan olumlu etkiye yol açmamaktadır.

Üçüncü makale, startup’ların performansını analiz etmektedir. Startup’lar, doğası itibarıyla geleneksel KOBİ’lerden farklıdır. Startup’lar, büyüme potansiyeli olan, yenilikçi, yaratıcı ve teknoloji odaklı iş modeline sahip KOBİ’ler olarak nitelendirilebilir. Bu çalışmada, ikinci makalede olduğu gibi farkların farkı yöntemi

kullanılmakta olup İstanbul’da mukim, bilişim sektöründe faaliyet gösteren ve yatırım almış startup’lar ile yatırım almamış startup’lar karşılaştırılmaktadır. Deney grubu ve kontrol grup arasındaki karşılaştırmalar istihdam, gelir ve kar değişkenleri üzerinden yapılmaktadır. Yatırım yapıldığı yıldan itibaren yapılan gözlemlerde yatırım alan startup’lar, almayan startup’lardan olumlu anlamda ayrılmaktadır. Bu son makale ile kamunun girişimcilik ekosistemine olumlu katkı sunarak bölgesel kalkınmayı teşvik etmek amacıyla geleneksel KOBİ’lere hibe veren bir mekanizma olmak yerine startup’lara yatırım yapan bir yapıya dönüşmesinin faydalı olabileceği değerlendirilmektedir.

Bu tez, yukarıdaki bahsedilen farklı yaklaşımların sonucunu gösteren bir çalışmadır. Firmalar, geri ödemesi olmayan hibe mekanizmalarını “aptal para” olarak görmektedir. Böylece, kamunun kullandığı bu tarz uygulamaların yenilikçiliğe ve büyümeye yeterli katkıyı sunmadığı değerlendirilmektedir. Birinci makalede, sektörden bağımsız olarak girişimcilik odaklı verilen desteklerin anlamsız sonuçlar doğurduğu görülürken ikinci makalede ise imalat sanayiinde verilen desteklerin olumsuz sonuçlarının olduğu gözlemlenmiştir. Bu sonuçların ardından, üçüncü makalede kamunun farklı gruplar üzerinde farklı bir destek enstrümanı uygulaması önerilmektedir. Başka bir ifadeyle, kamunun startup ekosistemine yatırımcı olarak dahil olması ve startaplara “akıllı para” dağıtarak onların kurumsal kültürünü, teknolojik kapasitelerini ve yenilikçi iş fikri sayılarını artırmaları önerilmektedir.

**Anahtar Kelimeler:** Devlet Destekleri, Girişimcilik, Bölgesel Kalkınma, Etki Değerlendirmesi, Mali Destek, Firma Performansı, KOBİ, Startup, Fonlar.

## **ABSTRACT**

### **THREE ESSAYS ON REGIONAL DEVELOPMENT**

**Mehmet Onur Partal**

**June, 2022**

This thesis comprises of three essays, which are “The Effectiveness of Governmental Grant Mechanisms in Turkey: Linking with Entrepreneurship”, “Financial Support and SME Performance in Manufacturing Industry from the Perspective of Impact Evaluation”, and “Startup Performance from an Economic Development Perspective: Impact Evaluation After Funding Stage”.

The first essay delves into a different puzzle, namely the questioning of the existence or nonexistence of the effect of government grants on entrepreneurship. Governments provide grants to current or prospective entrepreneurs in order to increase the number of new firms, jobs, and economic activities in order to boost regional development. However, the grant programs are now controversial since there is a rising criticism on their effectiveness. In this essay, the effectiveness of Turkey’s major governmental grant mechanisms, TÜBİTAK Teydeb, KOSGEB, and Development Agencies, has been analyzed using econometric models with fixed effects and stepwise-backward selection covering 26 NUT-II regions in Turkey. Contrary to expectations, the findings of this study revealed that grants provided by public institutions have insignificant effects on entrepreneurship stimulation in terms of new firm establishment and new firm birth rate. Thus, the results led to further need to investigate the outcomes of various types and amounts of governmental grant mechanisms.

The second essay examines the effectiveness of government grants (subsidies) from the standpoint of SMEs using impact evaluation. Despite the progress and increasing number of such grant programs over the last decade, only a small number of studies have investigated their effectiveness and impact using evaluation methods that aim to reveal the improvement in firm performance, if any, compared to a control group. In this paper, a counterfactual impact evaluation will be carried out for a treatment group that received subsidy or financial assistance at both national level and various regional levels. The outcomes will be compared to a control group. Using the difference in differences estimation, the comparison will be based on a variety of indicators in the manufacturing industry, such as employment, average labor cost, profits, value added, and export volume. The findings show us that the performance of subsidized firms (the treatment group) does not meet expectations, and even lags behind the control group.

The third essay intends to explore the performance of startups. Startups, which are by nature different than traditional enterprises due to their innovative and technological features, are often defined as SMEs with the potential to grow rapidly. In this paper, counterfactual impact evaluation will be implemented for a treatment group, which is funded by investors in Istanbul, Turkey. The results are being compared to those of a control group. Employing difference in differences estimation, the comparison is

based on a variety of indicators including employment, revenue, and profit generation in ICT sector. Our results show us that the performance of funded startups positively diverges from the unfunded startups after the intervention period. At the end of this study, it has been concluded that governments are recommended to be involved in the entrepreneurship ecosystem as investors rather than grant allocators.

This dissertation is the result of a research covering various aspects. Due to the nature of grants and subsidies, firms see them as “dumb money”. Therefore, using such tools by governments might not be effectively pushing firms to innovate and scale up. The first and second essays exhibit the same outcomes both for entrepreneurship-based grants regardless of sector and for the manufacturing industry, which is the most dominant sector among granted firms. After having insignificant or negative results, the third essay suggests a different instrument to be utilized on a different group of firms. In other words, governments are implicitly encouraged to become actors in the startup ecosystem as angel investors; and inject “smart money”, which leads to increased corporate culture, network, technology, and innovative business models.



**Key Words:** Government Grants, Subsidy, Entrepreneurship, Regional Development, Impact Evaluation, Financial Support, Firm Performance, SMEs, Startup, Funds.

## ACKNOWLEDGEMENTS

Throughout the writing of this dissertation I personally have received a great deal of support and assistance.

First of all, I would like to express my sincere gratitude to my advisor, Professor Feride Gönel, for her dedicated support and guidance during my graduate life. Professor Gönel continuously provided encouragement and was always willing and enthusiastic to assist in any way she could throughout my dissertation. Her insightful feedback pushed me to sharpen my thinking and brought my work to a higher level.

I would also like to thank Professor Hüseyin Taştan and Professor Ferda Halıcioğlu who took the time to reflect on their invaluable comments and inspiring approaches during the completion of this dissertation.

In addition, I would like to thank my mom, Neriman Partal, and dad, Mehmet Partal, for their wise counsel and sympathetic ear. They have always been there for me throughout my education.

Finally, I could not have completed this dissertation without the support of my wife, Duygu Partal, who provided stimulating discussions and sacrificed her time to make this happen. Last, I would like to thank my sons, Metehan and Kerem, for their happy distractions to rest my mind outside of my research.

Istanbul; June, 2022

Mehmet Onur PARTAL

## CONTENTS

<b>ÖZ</b> .....	iii
<b>ABSTRACT</b> .....	v
<b>ACKNOWLEDGEMENTS</b> .....	vii
<b>CONTENTS</b> .....	viii
<b>LIST OF TABLES</b> .....	xi
<b>LIST OF FIGURES</b> .....	xiii
<b>ABBREVIATIONS</b> .....	xiv
<b>1. INTRODUCTION</b> .....	1
<b>2. THE EFFECTIVENESS OF GOVERNMENTAL GRANT MECHANISMS IN TURKEY: LINKING WITH ENTREPRENEURSHIP</b> .....	5
2.1. Introduction .....	5
2.1.1. Financing Entrepreneurship in the Context of Regional Development Efforts by Governments .....	5
2.1.2. Turkey’s Regional Development Efforts after the 2000s .....	7
2.2. Literature Review on the Relationship between Governmental Grants and Entrepreneurship .....	9
2.3. Theoretical Framework .....	19
2.3.1. Entrepreneurship Theories .....	20
2.3.2. Linking Resource-Based Entrepreneurship Theories with Microcredit Theory .....	21
2.4. Data, Methodology and Empirical Results .....	23
2.4.1. Research Hypothesis .....	23
2.4.2. Data .....	24
2.4.3. Descriptive Statistics .....	26
2.4.4. Methodology .....	30
2.4.4.1. Fixed Effect Panel Model.....	30
2.4.4.2. Stepwise Backward (Step-Down) Selection .....	31
2.4.5. Estimating Equations and Empirical Results .....	32
2.5. Conclusion .....	38
References .....	41

Appendix to Chapter 2 .....	46
<b>3. FINANCIAL SUPPORT AND SME PERFORMANCE IN MANUFACTURING INDUSTRY FROM THE PERSPECTIVE OF IMPACT EVALUATION.....</b>	<b>51</b>
3.1. Introduction .....	51
3.2. An Overview of Major Support Programs for Turkish Firms .....	54
3.2.1. KOSGEB (Small and Medium Sized Enterprises Development Organization).....	57
3.2.2. TUBITAK (The Scientific and Technological Research Council of Turkey) .....	57
3.2.3. Regional Development Agencies .....	58
3.3. Literature Review on Financial Support and SME Performance from the Perspective of Impact Evaluation.....	58
3.3.1. Literature for Developed Countries .....	59
3.3.2. Literature for Developing Countries .....	63
3.4. Theoretical Framework .....	69
3.4.1. Theory of Firm Growth.....	70
3.4.2. Theory of Economic Development and the Different Roles of an Entrepreneur.....	70
3.5. Data, Methodology and Empirical Results .....	72
3.5.1. Research Hypothesis .....	72
3.5.2. Data .....	72
3.5.3. Descriptive Statistics.....	74
3.5.4. Methodology .....	75
3.5.4.1. Counterfactual Impact Evaluation: Average Treatment Effect.....	75
3.5.4.2. Difference-in-Differences .....	78
3.5.5. Estimating Equations and Empirical Results .....	80
3.5.6. Regression Outcomes.....	81
3.6. Conclusion .....	87
References .....	90
<b>4. STARTUP PERFORMANCE FROM AN ECONOMIC DEVELOPMENT PERSPECTIVE: IMPACT EVALUATION AFTER FUNDING STAGE .....</b>	<b>94</b>
4.1. Introduction .....	94
4.1.1. What is a startup? .....	95
4.1.2. How do startups diverge from traditional SMEs?.....	95
4.1.3. A Regional Approach: What is a start-up ecosystem?.....	96

4.1.4. Why are startups important? .....	99
4.1.5. Startup Ecosystem in Turkey .....	99
4.1.6. Milestones for Government Support in the Turkish Startup Ecosystem	104
4.1.7. Comparison of Turkey with Other Countries .....	106
4.1.8. Comparison of Istanbul with Other Ecosystems .....	108
4.2. Literature Review .....	111
4.3. Theoretical Framework .....	114
4.3.1. Monopolistic Competition .....	115
4.3.2. Startup Theories: Entrepreneurial Theory.....	116
4.4. Data, Methodology and Empirical Results .....	117
4.4.1. Research Hypothesis .....	118
4.4.2. Data .....	118
4.4.3. Descriptive Statistics .....	120
4.4.4. Methodology .....	122
4.4.4.1. Counterfactual Impact Evaluation: Average Treatment Effect.....	122
4.4.4.2. Difference-in-Differences .....	124
4.4.5. Estimating Equations and Empirical Results .....	126
4.4.6. Regression Outcomes .....	127
4.5. Conclusion .....	133
References .....	135
<b>5. CONCLUSION.....</b>	<b>138</b>

## LIST OF TABLES

Table 2. 1. Summary of Recent Empirical Literature .....	10
Table 2. 2. Microcredit Network and Motivations of Actors.....	22
Table 2. 3. Major Grant Programs Designed to Stimulate Entrepreneurship .....	24
Table 2. 4. Variables* .....	25
Table 2. 5. Regression Models.....	36
Table 2. 6. Variance Inflation Factor .....	37
Table 2. 7. Description and Sources of Data*.....	46
Table 2. 8. Nomenclature of Territorial Units for Statistics in Turkey* .....	48
Table 3. 1. Summary of Recent Empirical Literature for Developed Countries.....	60
Table 3. 2. Summary of Recent Empirical Literature for Developing Countries .....	65
Table 3. 3. Roles of the Entrepreneur in the History of Economic Theory according to Hebert and Link (1988).....	71
Table 3. 4. Data (Firm) Filtering Criteria.....	73
Table 3. 5. Description of Variables .....	74
Table 3. 6. Summary of the Main Covariates in the Final Dataset .....	75
Table 3. 7. Means of control and treatment groups.....	78
Table 3. 8. A Visual Exhibition of Difference in Differences Estimation.....	79
Table 3. 9. Regression Outcomes of Manufacturing Industry SMEs in Turkey.....	81
Table 3. 10. Regression Outcomes of Manufacturing Industry SMEs in Istanbul (TR10).....	83
Table 3. 11. Regression Outcomes of Manufacturing Industry SMEs in Turkey less Istanbul (TR10) .....	84
Table 3. 12. Regression Outcomes of Manufacturing Industry SMEs in Marmara Region (TR10, TR21, TR22, TR41, and TR42) .....	85
Table 3. 13. Regression Outcomes of Manufacturing Industry SMEs in Turkey less Marmara Region (TR10, TR21, TR22, TR41, and TR42).....	86
Table 4. 1. Milestones for Government Support in Turkish Startup Ecosystem .....	104
Table 4. 2. Europe Funding Leagues in 2020 .....	107
Table 4. 3. Top 100 Emerging Ecosystem Rankings, 2021 .....	109
Table 4. 4. Market Structure Characteristics.....	115
Table 4. 5. Data (Startup) Filtering Criteria.....	119

Table 4. 6. Description of Variables .....	120
Table 4. 7. Summary of the Main Covariates in the Final Dataset .....	121
Table 4. 8. Means of Control and Treatment Groups .....	125
Table 4. 9. A Visual Exhibition of Difference in Differences Estimation.....	125
Table 4. 10. Regression Results .....	128



## LIST OF FIGURES

Figure 2. 1. Grant per Capita across Regions in TRY (Cumulative for 2010-2014). 27	27
Figure 2. 2. Grants Per Capita (TRY) vs New Firm Birth Rate (2010-2014) for Some Selected NUTS-II Regions in Turkey* ..... 29	29
Figure 2. 3. Scatterplots: Grants per capita vs. Some Variables ..... 34	34
Figure 3. 1. Number of Granted (Successful) Applications..... 55	55
Figure 3. 2. Amount of Grant Allocated to Firms in Some Major Financial Support Mechanisms (TRY, million)* ..... 56	56
Figure 3. 3. Stylized Quasi-Experimental Design with Treatment ..... 77	77
Figure 3. 4. Time Frame of Treatment Group vs Control Group..... 80	80
Figure 4. 1. Major Players in a Startup Ecosystem ..... 98	98
Figure 4. 2. Number of Startups across Cities in Turkey, as of 2019 end ..... 100	100
Figure 4. 3. Investment Volume on Startups by Stages, 2010-2019 (million USD) 101	101
Figure 4. 4. Idea Stage vs. Seed & Early VC Stage: Number of Granted Startups (by government) & Invested Startups (by angel investors & VCs), 2019 ..... 102	102
Figure 4. 5. Idea Stage vs. Seed & Early VC Stage: Amount of Grant Received by Startups (by government) & Amount of Investment Received by Startups (by angel investors & VCs), million USD, 2019 ..... 103	103
Figure 4. 6. Stylized Quasi-Experimental Design with Treatment ..... 124	124
Figure 4. 7. Time Frame of Treatment Group vs Control Group..... 127	127
Figure 4. 8. Control Group between 2015 and 2019..... 129	129
Figure 4. 9. Treatment Group between 2015 and 2019..... 130	130
Figure 4. 10. Control Group vs. Treatment Group: Labor ..... 130	130
Figure 4. 11. Control Group vs. Treatment Group: Income..... 131	131
Figure 4. 12. Control Group vs. Treatment Group: Profit ..... 132	132

## ABBREVIATIONS

<b>ASVAPP</b>	: Italian Association for the Development of Evaluation and Analysis of Public Policy
<b>BIGG</b>	: Individual Young Enterprise
<b>CIAL</b>	: Colombia Local Agricultural Research Committees
<b>DID</b>	: Difference in Differences
<b>EU</b>	: European Union
<b>GDP</b>	: Gross Domestic Product
<b>ICT</b>	: Information and Communications Technology
<b>KOSGEB</b>	: Small and Medium Sized Enterprises Development Organization of Turkey
<b>NACE</b>	: Nomenclature of Economic Activities
<b>NGF</b>	: National Guarantee Fund
<b>NGO</b>	: Nongovernmental Organization
<b>NUTS</b>	: Nomenclature of Territorial Units for Statistics in Turkey
<b>OECD</b>	: Organization for Economic Cooperation and Development
<b>R&amp;D</b>	: Research and Development
<b>RDI</b>	: Rural Development Index
<b>SAPARD</b>	: Special Accession Program for Agricultural and Rural Development
<b>SBIR</b>	: Small Business Innovation Research
<b>SCP</b>	: Seed Capital Program
<b>SERCOTEC</b>	: Chilean Technical Cooperation Services
<b>SME</b>	: Small and Medium Sized Enterprises
<b>SUTVA</b>	: Stable Unit Treatment Value Assumption
<b>TEYDEB</b>	: Technology and Innovation Support Program
<b>TIIP</b>	: Tennessee Infrastructure for Industry Program
<b>TRY</b>	: Turkish Lira
<b>TSKB</b>	: Turkish Industrial Development Bank
<b>TUBITAK</b>	: The Scientific and Technological Research Council of Turkey
<b>TURKSTAT</b>	: Turkish Statistical Institute
<b>UNIDO</b>	: United Nations Industrial Development Organization

**US** : United States  
**USD** : United States Dollar  
**VC** : Venture Capital  
**WWW** : World Wide Web



## **1. INTRODUCTION**

In recent years, the concept of regional development or regional economic development has been one of the key topics of scientific studies. These studies mostly focus on the outcomes of governmental policies prioritizing regional development efforts. This appeal could be related to the growing popularity of decentralization initiatives as a result of regional inequalities. Entrepreneurs have always been an important determinant for regional development since they are key contributors to the economy in a variety of ways, including innovation, production, and job creation.

Entrepreneurs have an initial idea, which triggers customers to buy it. The motivation lies behind the innovative aspect of this idea. With customers willing to buy the products endowed with innovative ideas, entrepreneurs install production lines. At the end of the day, more production is considered to employ more skilled and/or unskilled labor. OECD (2005) defines entrepreneurship as a job creation engine that has a positive impact on local, regional and national economies.

Due to the reasons laid above, entrepreneurship is considered as one of the primary game changers, not only by international organizations but also by researchers, in order to help regions economically develop and enhance living standards. Moreover, entrepreneurship is seen as one of the key drivers of economic development by policymakers at both the national and regional levels. 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.

These prominent policies have resulted in a worldwide rise of government programs targeted at boosting entrepreneurship and aiding the survival and growth of businesses, particularly SMEs. Countries such as Italy, Turkey, Portugal and Finland have implemented programs in order to support entrepreneurship and contribute to regional development. Italy's program based on Law 488, which is partly funded by the EU,

and Turkey's Support Programs for Businesses through 26 Development Agencies may be classified as examples on regional development.

Through these support programs, governments recognize SMEs as important contributors to economic growth and development. Therefore, SMEs are perceived to be supported in order to preserve their market presence and spur the formation of new businesses. A stronger economic environment is created by the establishment of new businesses, the scaling up of startups, and the assistance of existing businesses in maintaining their market position.

It is often assumed that those companies lag behind others owing to a lack of capital and/or skilled labor, poor management, low productivity, inability to adapt to new technologies, and so on. As a result, governments have been implementing a variety of initiatives and grant programs aimed at facilitating access to finance, promoting the recruitment of skilled labor, increasing productivity, and encouraging the export of goods and services.

The influence of subsidies and grants on SME performance has been studied extensively in recent years, particularly in the new millennium. This results in the questioning of how these grant programs and/or subsidies impact economy in the overall. For instance, Karhunen and Huovari (2015) investigate the effect of subsidies in Finland from the perspectives of labor productivity and employment; on the other hand, Bondonio et al. (2016) examine the effect of EU funds on employment and added value.

The World Bank's Impact Evaluation Guidebook (2016) states that development programs and policies are typically designed to change outcomes such as raising incomes, improving learning or reducing illness. The outcomes may not be reflecting the anticipated results; however, the question "Why?" is rarely asked when these policies do not work in practice. In addition to this, program managers and policy makers are interested in reporting only the inputs and outputs of a program. These inputs and outputs can be listed as the amount spent during the program, the number of textbooks, brochures and other printed materials distributed, the number of people benefitted from the program and so on. In contrary, it is more important to focus on assessing the designated goals introduced at the very beginning of a program.

The governmental institutions currently focus on the outcomes, desire to measure the impact, and compare with the scenario of its absence. In other words, governments, which can be called as funders, now conduct studies on the effectiveness of these support/grant programs. This approach leads to the term called impact evaluation, which is defined as an assessment of how the intervention (grants/subsidies) being evaluated affects outcomes, whether these effects are intended or unintended (OECD, 2019). Michalek (2012) attempts to evaluate the impact of SAPARD for the treatment regions compared to the control regions. Soares et al. (2010) review the performance of Brazil's Bolsa Familia - one of the largest conditional cash transfer programs in the world, benefiting roughly 11 million families - and its impact on inequality, poverty, consumption, education, health care, and labor force participation, comparing the outcomes of its existence to its absence.

As seen in the studies shown in the previous paragraph, governments focus mainly on SMEs and financing of SMEs. However, it should be noted that SMEs can be categorized into two, which are traditional SMEs and startups. SMEs and startups may sound similar terms in a sense that both aim to earn profit, realize positive growth rate and survive in the market. Startups are often defined as SMEs with a potential to grow rapidly. Steve Blank<sup>1</sup>, a Silicon Valley entrepreneur and adjunct professor of entrepreneurship at Stanford University, defines a startup as an organization formed to search for a repeatable and scalable business model. The idea behind a startup is the determination to grow quickly in a competitive industry using all of the innovation they can muster. Being unique and different, standing out against other businesses is the key idea behind a startup. They typically build on experience as they grow – adapting and changing with the way the market goes (Harris, 2016).

How a startup differs from a standard SME is that it aims to solve universal problems with innovative solutions. Startups have problem-solving mindsets in their business models. Furthermore, startups produce innovative products (goods or services) that give them monopolistic power in the market. Startups are undeniably crucial for economy and a country's economic success. The debate revolves around value-added, employment, wealth, higher living standards, and economic growth.

---

<sup>1</sup> <https://steveblank.com/2010/01/25/whats-a-startup-first-principles/> (access on March 15, 2020)

Our study is intended to find out alternative solutions to contribute to regional development and national economic growth. In this respect, this dissertation comprises three major sections, which are “The Effectiveness of Governmental Grant Mechanisms in Turkey: Linking with Entrepreneurship”, “Financial Support and SME Performance in Manufacturing Industry from the Perspective of Impact Evaluation”, and “Startup Performance from an Economic Development Perspective: Impact Evaluation After Funding Stage”. Since regional development is a broad topic, there may be different approaches or dimensions to be analyzed and sought. Due to the lack of data, this study failed to cover all government support mechanisms in Istanbul and/or Turkey. Furthermore, startups only in ICT sector were analyzed since there is insufficient data in the startup ecosystem.

The first study focuses on the effectiveness of major governmental grant mechanisms from a regional perspective through econometric analyses. This section questions the significance of government grants designed to boost entrepreneurial activities in terms of the establishment of new firms and new firm birth rate.

The second study focuses on the effectiveness of government grants (subsidies) from an SME perspective through impact evaluation. This section questions the significance of financial support or subsidies allocated to firms in terms of employment, average labor cost, value added per labor, profit per labor, and export per labor.

The third study seeks for alternative mechanisms to boost regional development. This section questions the significance of funds allocated to ICT startups in terms of employment, profit and income. Rather than allocating grants to traditional SMEs, this section implicitly suggests that governments might be allocating grants to businesses producing higher value added goods and services.

The conclusion part makes an overall assessment of these three essays and the results of regressions. It has been aimed to find common aspects of all these three essays and connect outcomes through a regional development prespective. By the end of this section, policy recommendations, especially for governments, are laid down; and governments are suggested utilize new tools to contribute to regional development.

## **2. THE EFFECTIVENESS OF GOVERNMENTAL GRANT MECHANISMS IN TURKEY: LINKING WITH ENTREPRENEURSHIP**

### **2.1. 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.

#### **2.1.1. 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 OECD<sup>2</sup> 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 Union<sup>3</sup>, "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

---

<sup>2</sup> <http://www.oecd.org/cfe/regional-policy/regionaldevelopment.htm> (access on Jan 15th, 2019).

<sup>3</sup> [https://europa.eu/european-union/topics/regional-policy\\_en](https://europa.eu/european-union/topics/regional-policy_en) (access on Jan 15th, 2019).

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 by 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.

According to the Cambridge Dictionary, the term “innovative” means “using new methods/ideas<sup>4</sup>”. Therefore, innovative projects are meant to embrace new methods and/or ideas. Obviously, there is a necessity for entrepreneurs to access financial resources 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 Turkey allocate grants to a large portfolio of schemes that 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 results<sup>5</sup>.

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

---

<sup>4</sup> <https://dictionary.cambridge.org/tr/s%C3%B6zl%C3%BCk/ingilizce/innovative> (access on Jan 15th, 2019).

<sup>5</sup> Read more: <http://www.businessdictionary.com/definition/government-grant.html>

concept used as entrepreneurship mainly concentrates on small business activities with a business model.

### **2.1.2. Turkey's Regional Development Efforts after the 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.

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 governmental 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.

## **2.2. 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 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 are 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 by 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 programs, 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 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.

**Table 2. 1. Summary of Recent Empirical Literature**

Study		Dependent Variables	Independent Variables	Empirical Findings
Rasool et al. (2012)	<b>Covered Regions/ Countries</b>	8 Asian countries	Total Entrepreneurial Activity; Necessity Driven Entrepreneurship Activity; Improvement Driven Entrepreneurship Activity; Growth Oriented Entrepreneurship Activity; change in income per capita; change in employment;	R&D expenditure (% of GDP) of the government plays significant role on entrepreneurship.
	<b>Period</b>	2005-2011	Population growth, government stability, R&D expenditure (% of GDP), socio-economic conditions, government consumption expenditures. Secondary education pupil, investment profile	
	<b>Model</b>	Stepwise Least Square with Forward Selection Method and Pooled Least Square without random and fixed effects		

Study		Dependent Variables	Independent Variables	Empirical Findings
Murray and Ullrich (2005)	<b>Covered Regions/Countries</b>	50 counties of Tennessee, USA	Grants per capita, rate of manufacturing industry labor, rate of services sector labor, rate of retail sector labor, non-whites, poverty rate, high-school drop out rate, rate of the population between ages 5-17, rate of the population over age 65, dummy representing an Appalachian. Dummy representing interstate access within the county (yes=1), dummy representing whether is a part of MSA (yes=1)	The analysis finds little evidence that grants are effective in promoting economic growth at the county level. 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.
	<b>Period</b>	1997-2002		
	<b>Model</b>	Fixed Effects Panel Data Model		

Study		Dependent Variables	Independent Variables	Empirical Findings	
Wren (2005)	<b>Covered Regions/Countries</b>	United Kingdom	N/A	N/A	It is argued that the recent criticisms of the the Regional Selective Assistance scheme grants are largely misplaced and the grants are cost-effective in employment terms.
	<b>Period</b>	1960 - 2000			
	<b>Model</b>	N/A			
McKenzie (2015)	<b>Covered Regions/Countries</b>	Nigeria	Firm ownership, employment, innovation, sales, profits	Survey questionnaire	Nigeria's "YouWiN!" business plan competition has had large impacts on the rate of business start-up, survival of existing firms, employment, profits, and sales of winning firms. It has succeeded in generating more firms with 10 or more employees, and provides the first experimental evidence of how direct policy action can spur the growth of such firms.
	<b>Period</b>	2011-2015			
	<b>Model</b>	Survey - Multiple Linear Regression (cross-sectional)			

Study		Dependent Variables	Independent Variables	Empirical Findings	
Duran (2018)	<b>Covered Regions/ Countries</b>	NUT-II Regions of Turkey	Firm Birth Rate	Per capita tax paid, Per capita bank saving, Unemployment rate, employment rate, KOSGEB grants, TUBITAK grants, Firm ownership rate	The findings show that only TUBITAK's scientific grants and per capita saving rate have positive effect on new firm birth rate.
	<b>Period</b>	2010-2014			
	<b>Model</b>	Stepwise least squares dummy variables-LSDV			

Study		Dependent Variables	Independent Variables	Empirical Findings
Yavan (2011)	<b>Covered Regions/ Countries</b>	81 provinces of Turkey	GDP, per capita GDP	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. Provinces with a larger population, greater number of industrial enterprise, higher number of patent numbers and better credit availability have grown faster than all other provinces of Turkey. On the other hand, the empirical findings also indicate that while public investment has no significant effect on the regional economic growth, human capital has only limited impacts on the growth at the regional level.
	<b>Period</b>	2000		
	<b>Model</b>	Cross Sectional (OLS)		

Study		Dependent Variables	Independent Variables	Empirical Findings	
Yavan (2012)	<b>Covered Regions/ Countries</b>	81 provinces of Turkey	No of Incentive Certificates, Per capita no of incentive certificates, TRY amount of investment with incentive certificates, per capita TRY amount of investment with incentive certificates, additional employment through incentive certificates	GDP per capita, unemployment rate, capital injection on firms with 10+ employees, ratio of total trade volume to GDP, ratio of foreign capital to GDP, vote share of the political party in power, total (parliament) representative number, Village (Yes=1)	The empirical results, on the one hand, indicate that the spatial distribution/ allocation of regional incentive are explained by the level of income, the presence of private industry investment, trade openness, political/electoral power, the ideological tendency of the government, and regional policy. On the other hand, unemployment and openness to foreign investment are not significant determinants of incentive at regional level. These results suggest that incentives at regional level are determined not only by economic factors, but also by political and institutional factors.
	<b>Period</b>	2001-2008			
	<b>Model</b>	Least squares dummy variables-LSDV			

Study		Dependent Variables	Independent Variables	Empirical Findings	
Maden (2012)	<b>Covered Regions/ Countries</b>	Ispart and Burdur Provinces of Turkey	Employment growth, Product variety growth, production volume growth, sales growth, customer no growth, increase in product quality (increased=1)	Nationwide Exhibition Participant Support, Promotion Support, Skilled Labor Support, Test-Analysis-Calibration Support, Worldwide Exhibition Participant Support, Documentation Support	For the 294 SMEs in total, effects of the KOSGEB supports on the performances of the firms have been proved positive and meaningful.
	<b>Period</b>	2008-2011			
	<b>Model</b>	Logit and Tobit (Survey)			

Study		Dependent Variables	Independent Variables	Empirical Findings	
Blattman et al. (2014)	<b>Covered Regions/ Countries</b>	Uganda	Working capital, human capital, patience, engagement in a skilled trade, business assets, earnings	Assigned to Treatment, Gender, No of unpaid workers, total hours of unpaid workers	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. There is no effect seen, however, on social cohesion, antisocial behavior, or protest. Effects are similar by gender but are qualitatively different for women because they begin poorer in Uganda.
	<b>Period</b>	2007-2011			
	<b>Model</b>	Weighted Least Squares (intent-to-treat (ITT) estimate)			

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 of 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 effect 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.

### **2.3. 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 strategically<sup>6</sup>.

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

---

<sup>6</sup> Advanced Microeconomic Theory, Geoffrey A. Jehle and Philip J. Reny (2011), Pearson.

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 (Szajnowska-Wysocka, 2009) explains a social world presented as a diverse network of relations and influences between different subjects – actors (entrepreneurs, local government) 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.

### **2.3.1. Entrepreneurship Theories**

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 a significant role since they involve larger or narrower network structures. For the human capital, the demographic specifications, education level, and even female labor participation rate may play a role.

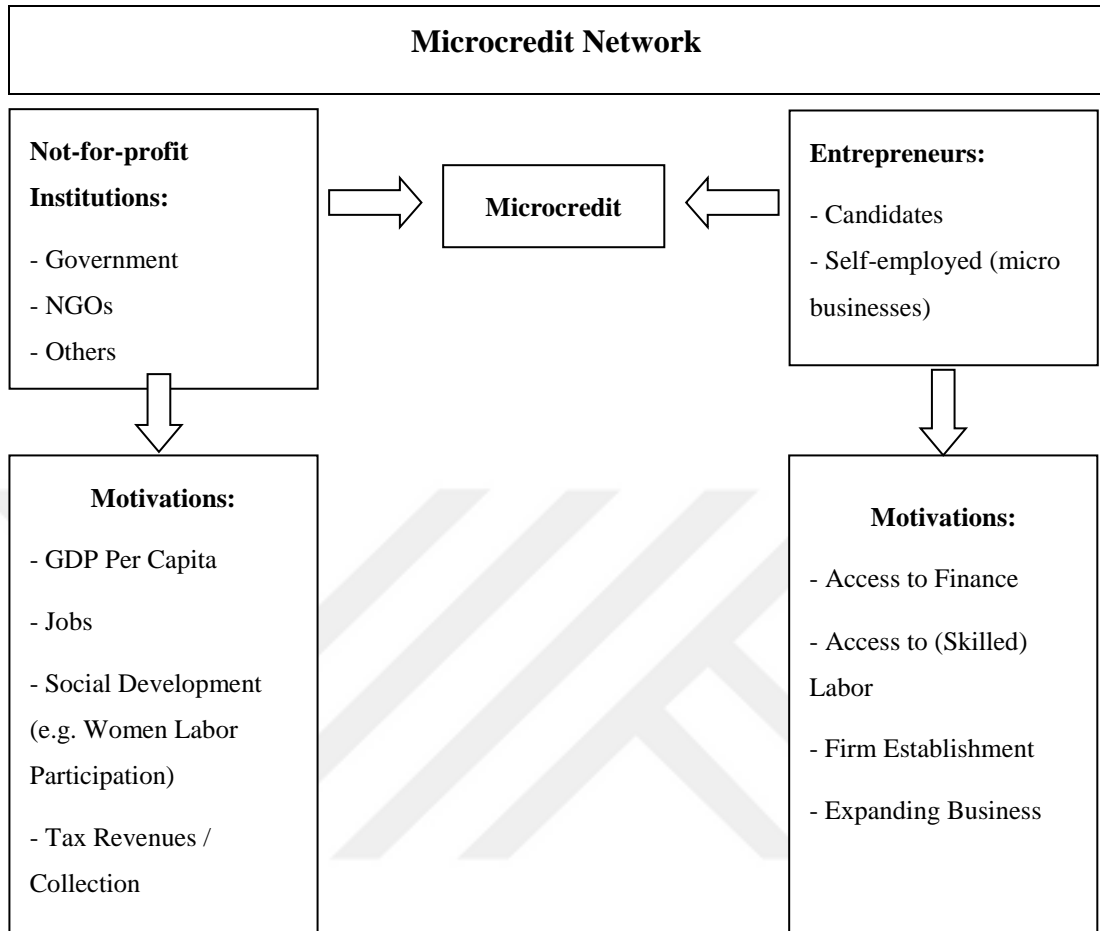
On the other hand, there is a significant relationship between resource-based entrepreneurship theories and the microcredit theory, which targets micro or small businesses to contribute to local economic development. In the proceeding part, the linkage between these two theories will be explored.

### **2.3.2. 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 2. 2. Microcredit Network and Motivations of Actors**



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

Table 2.2 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 provision 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 to 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. Therefore, the goal of this paper is to find variables that will capture the context of these theories.

## **2.4. 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.

### **2.4.1. 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 no significant effect on the establishment of new firms and the new firm birth rate.

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

## 2.4.2. 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 (Ministry of Industry and Technology since 2018). Table 2.3 introduces the major grant programs of the Turkish government supporting entrepreneurial activities.

**Table 2. 3. 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 table<sup>7</sup>.

**Table 2. 4. Variables\***

Variables			
LNGPC	UNEMPRATE	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 to Chapter 2.

The grant programs shown in table 2.3 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

<sup>7</sup> The description and sources of variables are shown in Appendix to Chapter 2.

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), the employment share of agriculture, the employment share of manufacturing, the employment share of services, female labor participation rate, electricity consumption per capita, high school graduation rate, dummy variable representing less developed regions<sup>8</sup>, government capital expenditures per 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 the consumer price index, taking 2010 as the base year.

In this essay, 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.

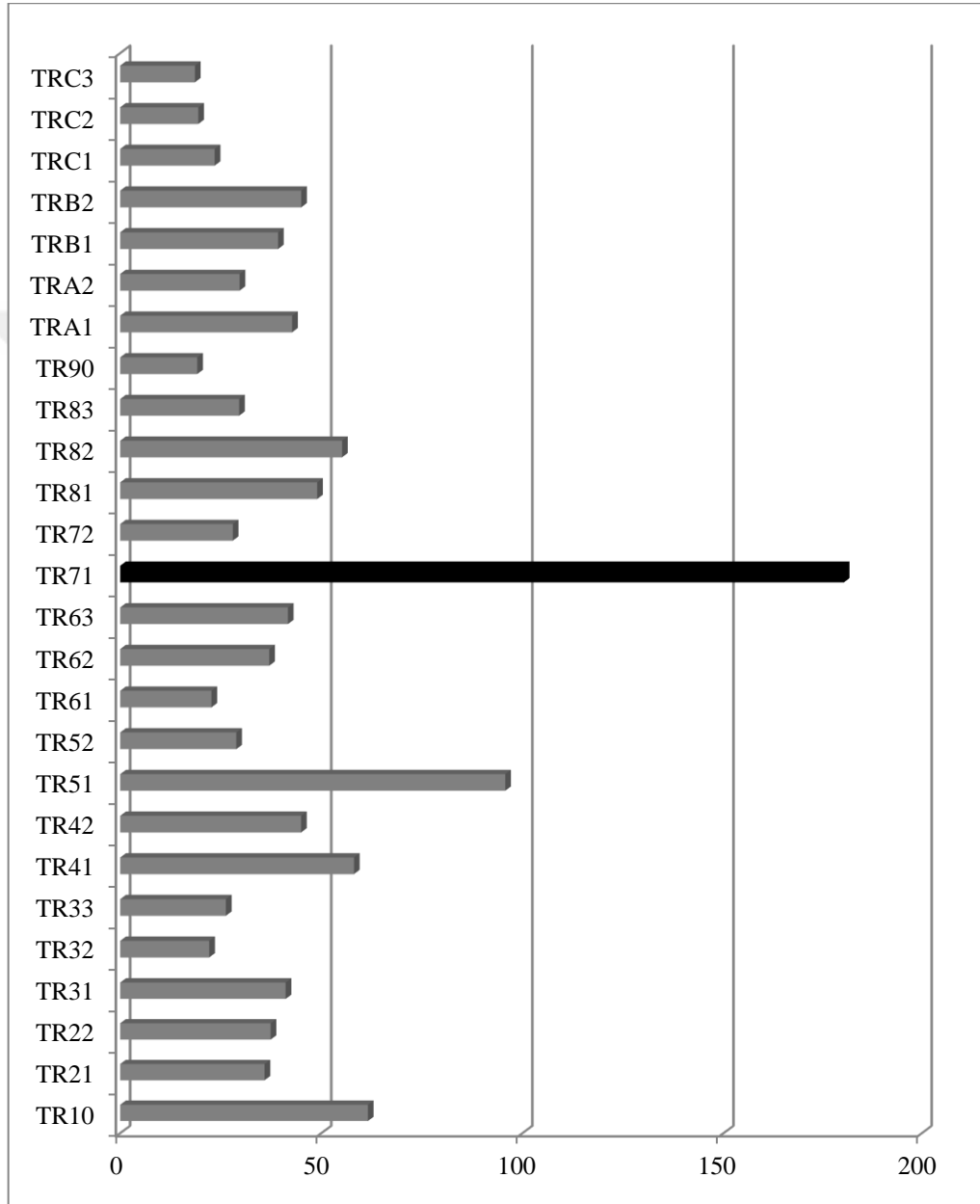
### **2.4.3. Descriptive Statistics**

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.

---

<sup>8</sup> 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.

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 2.8 in the Appendix to this chapter for the full list of NUTS-II regions in Turkey.

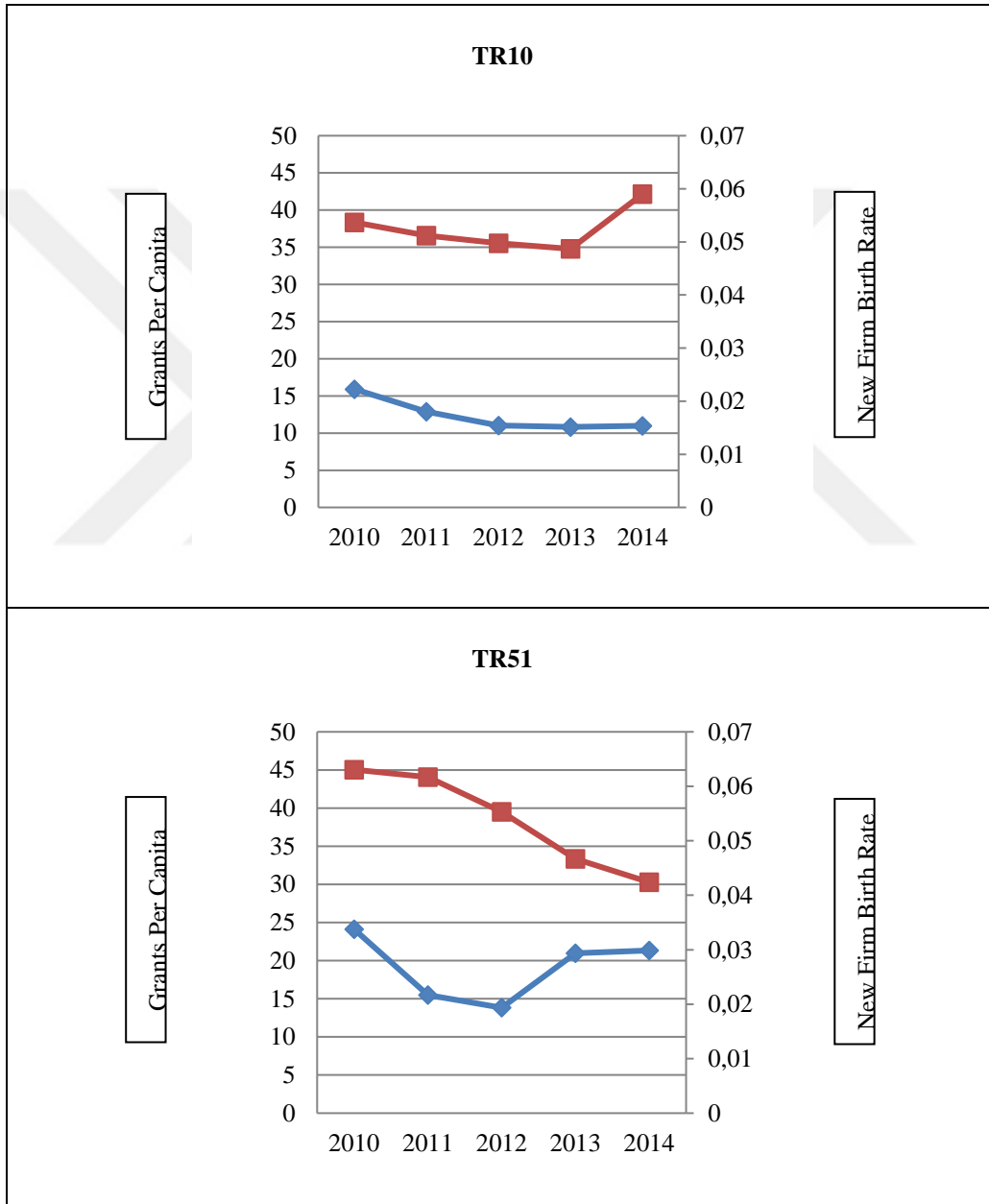


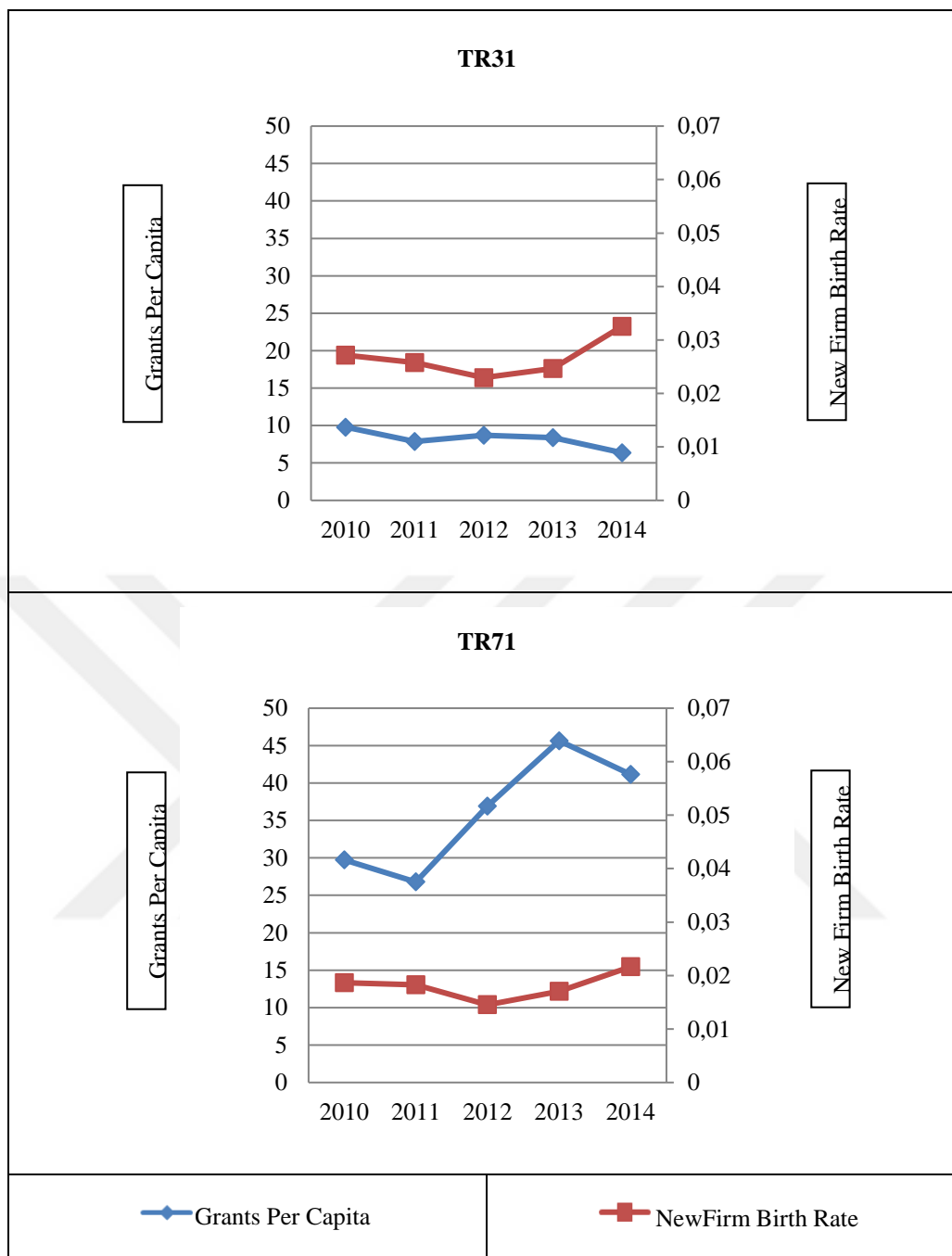
**Figure 2. 1. Grant per Capita across Regions in TRY (Cumulative for 2010-2014)**

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

Figure 2.1 summarizes the cumulative grants per capita in TRY allocated across regions. TR71 region, which includes Kırkkale, 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. 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

Figure 2.2 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 the 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.

#### 2.4.4. 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 includes 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.

##### 2.4.4.1. Fixed Effect Panel Model

The following stylized model of economic growth is being used:

$$Y_{it} = \alpha_i + \beta_1 LNGPC_{it} + \beta_2 X_{2it} + \dots + \beta_k X_{kit} + v_t + \delta_i + u_{it} \quad (2.01)$$

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 ( $t=1, 2, \dots, T$ ).

$$\alpha_{it} = \alpha_i \quad (2.02)$$

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

$$\beta_{kit} = \beta_k \quad (k=2, 3, \dots, K) \quad (2.03)$$

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

$$Y_{it} = (\alpha_1 D_{1t} + \alpha_2 D_{2t} + \dots + \alpha_n D_{nt}) + \beta_1 LNGPC_{it} + \beta_2 X_{2it} + \dots + \beta_k X_{kit} + u_{it} \quad (2.04)$$

*i*: 1, 2, ....130 : Observations

*j*: 1, 2, ....12 : Independent Variables

*k*: 1, 2, ....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 ( $\delta$ ) 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.

#### **2.4.4.2. Fixed Effect Panel Model: 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 model<sup>9</sup>.

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  $p \text{ value} < 0.05$  “keep variable”, if not “drop (the highest variable with the highest p-value first)”;

$$\text{Initial: } Y_{it} = \alpha_i + \beta_1 LNGPC_{it} + \dots + \beta_k X_{kit} + v_t + \delta_i + u_{it} \quad (2.05)$$

$$\text{Step 1: } Y_{it} = \alpha_i + \beta_1 LNGPC_{it} + \dots + \beta_{k-1} X_{kit} + v_t + \delta_i + u_{it} \quad (2.06)$$

$$\text{Step 2: } Y_{it} = \alpha_i + \beta_1 LNGPC_{it} + \dots + \beta_{k-2} X_{kit} + v_t + \delta_i + u_{it} \quad (2.07)$$

$$\text{Step n: } Y_{it} = \alpha_i + \beta_1 LNGPC_{it} + \dots + \beta_{k-n} X_{kit} + v_t + \delta_i + u_{it} \quad (2.08)$$

Our final forms after backward elimination:

$$LNNEWFRMNO = \alpha_i + \beta_1 LNGPC_{it} + \beta_2 LNFRGNINV_{it} + \beta_3 EMPSRV_{it} + \beta_4 EMPMAN_{it} + \beta_5 LNSAVPC_{it} + \beta_6 LNJOBS_{it} + v_t + \delta_i + u_{it} \quad (2.09)$$

$$NEWFRMBIRTHRT = \alpha_i + \beta_1 LNGPC_{it} + \beta_2 EMPSRV_{it} + \beta_3 HGHSCHGRADRT_{it} + \beta_4 LNSAVPC_{it} + \beta_5 LNJOBS_{it} + v_t + \delta_i + u_{it} \quad (2.10)$$

#### 2.4.5. 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

<sup>9</sup> [https://ncss-wpengine.netdna-ssl.com/wp-content/themes/ncss/pdf/Procedures/NCSS/Stepwise\\_Regression.pdf](https://ncss-wpengine.netdna-ssl.com/wp-content/themes/ncss/pdf/Procedures/NCSS/Stepwise_Regression.pdf) (access on Dec 04, 2018)

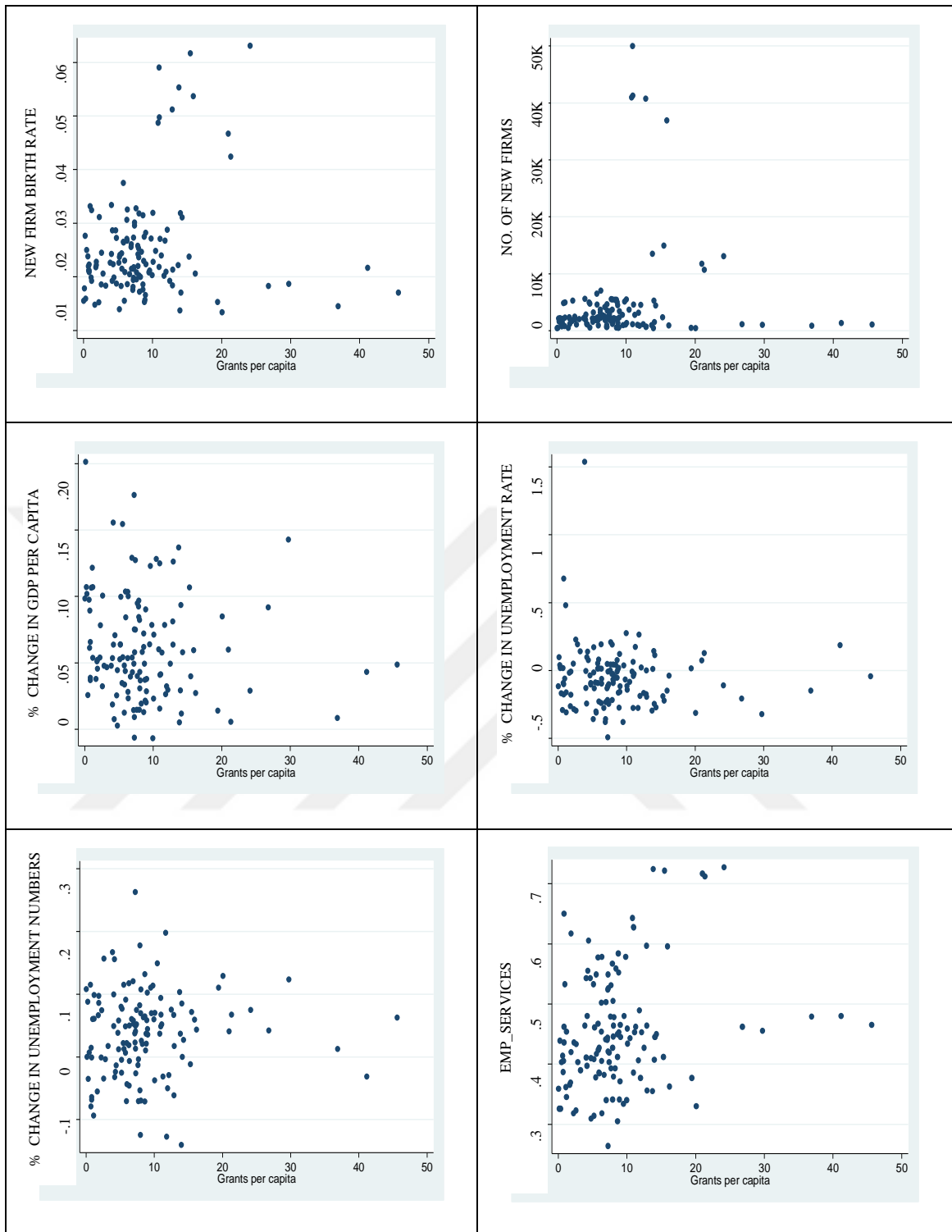
scope of grant programs. However, it is recognized that there may be endogeneity of grants, which may affect our findings.

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 a slight positive relationship with new firms establishments, new firm birth rate, gdp per capita, employment share of services sector, high school graduation rates, deposits in saving accounts in banks, and tax collection, whereas it has a slight negative relationship with unemployment rates, less developed regions, and change in per capita income.

As seen in Figure 2.3, grants per capita has a 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.



**Figure 2. 3. Scatterplots: Grants per capita vs. Some Variables**

Table 2.5 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 2. 5. Regression Models**

	<i>DEPENDENT VARIABLES</i>			
	<b>LN NO OF NEW FIRMS</b>		<b>NEW FIRM BIRTH RATE</b>	
	Fixed Effect Panel Model	Fixed Effect: Backward Selection (LN Grant Per Capita locked)	Fixed Effect Panel Model	Fixed Effect: Backward Selection (LN Grant Per Capita locked)
	b/t	b/t	b/t	b/t
LN Grant Per Capita	-0.007 (-0.55)	-0.004 (-0.41)	-0/000 (-0.92)	-0.000 (-1.52)
LN Foreign Investment	-0.013 (-1.73)	-0.016* (-2.27)	-0.000 (-1.38)	
LN Government Cap.Exp.	0.003 (0.05)		0.001 (0.58)	
Share of Services Sector in Employment	0.573 (1.18)	1.126** (3.08)	0.021 (1.44)	0.021* (2.26)
Share of Manufacturing Sector in Employment		1.659** (2.66)		
High School Graduate Rate	1.384 (0.34)		0.195 (1.59)	0.183* (2.08)
Unemployment Rate	0.258 (0.38)		0.014 (0.71)	
LN Saving Per Capita		0.610** (3.10)		0.015** (3.20)
LN Electricity Consumption	0.382 (1.75)		0.001 (0.14)	
Female Labor Participation Rate	0.016 (0.03)		-0.001 (-0.06)	
LN Population	1.883** (2.92)		-0.006 (-0.30)	
LN Employment Rate		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 2.6 shows us the variance inflation factor outcomes.

**Table 2. 6. Variance Inflation Factor**

<b>Variable</b>	<b>VIF</b>	<b>1/VIF</b>
Share of Services Sector in Employment	3	0.332814
High School Graduate Rate	2.92	0.341925
LN Population	2.16	0.463293
Female Labor Participation Rate	2.09	0.478833
LN Electricity Consumption	1.89	0.529945
Unemployment Rate	1.85	0.541168
LN Government Cap.Exp.	1.64	0.611113
LN Foreign Investment	1.59	0.628761
LN Grant Per Capita	1.28	0.783089
<b>Mean VIF</b>	<b>2.05</b>	

## 2.5. 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<sup>10</sup>”. 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 studies, the model in this paper could be 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 a 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 the services sector has a positive effect on entrepreneurial activities. Firms in the services sector are usually SMEs when compared to the manufacturing firms that are mostly of 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

---

<sup>10</sup> Market Business News, <https://marketbusinessnews.com/financial-glossary/smart-money/>, access on May 04, 2018.

encourage innovative behavior in entrepreneurs and help a country or a region to move up from an efficiency-driven economy to an 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 Uygulanmasi", *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](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 10<sup>th</sup>), 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.
- Law No. 4274 the Village Schools and Institutions Organization Law.
- Law No. 5449 Law on the Establishment and Duties of Development Agencies.
- 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).
- \_\_\_\_\_, “Development”, <http://www.oecd.org/development/> (access on Jan 15th, 2019).
- \_\_\_\_\_, “Regional Development Policy”, <http://www.oecd.org/cfe/regional-policy/regionaldevelopment.htm> (access on Jan 15th, 2019).
- \_\_\_\_\_, “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](http://www.tubitak.gov.tr/tubitak_content_files/english/TUBITAKcatalogue.pdf) (access on Jan 15th, 2019).
- Simpheh, 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 Buyume Üzerindeki Etkisi: Ampirik Bir Analiz", *Ekonomik Yaklaşım*, Vol. 22 (81), pp. 65-104.
- \_\_\_\_\_ (2012), "Türkiye’de Yatırım Teşviklerinin Bölgesel Belirleyicileri: Mekânsal ve İstatistiksel Bir Analiz", *Cografî Bilimler Dergisi*, Vol.10 (1), pp. 09-37

Yesilada, B. A. (2002), "Turkey's Candidacy for EU Membership", *Middle East Journal*, Vol. 56, No. 1 (Winter), pp. 94-111.



## Appendix to Chapter 2

**Table 2. 7. 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
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 2. 8. 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)
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)	Kırıkkale Province (TR711)
		Aksaray Province (TR712)
		Niğde Province (TR713)
		Nevşehir Province (TR714)
		Kırşehir Province (TR715)
	Kayseri Subregion (TR72)	Kayseri Province (TR721)
		Sivas Province (TR722)
		Yozgat Province (TR723)
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 Province (TRA21)
	Ağrı Subregion (TRA2)	Kars Province (TRA22)
		Iğdır Province (TRA23)
		Ardahan Province (TRA24)
		Malatya Province (TRB11)
Central East Anatolia Region (TRB)	Malatya Subregion (TRB1)	Elazığ Province (TRB12)
		Bingöl Province (TRB13)
		Tunceli Province (TRB14)
		Van Province (TRB21)
	Van Subregion (TRB2)	Muş Province (TRB22)
		Bitlis Province (TRB23)
		Hakkâri Province (TRB24)
		Gaziantep Province (TRC11)
Southeast Anatolia Region (TRC)	Gaziantep Subregion (TRC1)	Adıyaman Province (TRC12)
		Kilis Province (TRC13)
		Şanlıurfa Province (TRC21)
	Şanlıurfa Subregion (TRC2)	Diyarbakır Province (TRC22)
		Mardin Province (TRC31)
	Mardin Subregion (TRC3)	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.

### **3. FINANCIAL SUPPORT AND SME PERFORMANCE IN MANUFACTURING INDUSTRY FROM THE PERSPECTIVE OF IMPACT EVALUATION**

#### **3.1. Introduction**

It is not a secret that small and medium sized enterprises (SMEs) play a vital role in boosting economic growth and development. SMEs, when compared to larger organizations, can react promptly to the changing business environment and technology. By meeting the needs and wants of the customers, the goal of an SME or any business is to improve its economic value in its market. However, SMEs have several hurdles to tackle such as access to finance, weak management, lack of skilled labor, productivity, and funding R&D expenditures. Above all, as Cancino and Bonilla (2015) emphasize, the most important obstacle for implementing and boosting a new business idea is the lack of funding, which limits the growth of a young firm and causes to remain a small business over time.

Recognizing that SMEs are a critical player for the economic growth and development, they have to be supported in order to both maintain their presence in the market and also lead for new business formations.

In general, SMEs have the necessity of accessing capital in order to conduct R&D activities and to promote their goods & services until they accomplish a steady income to cover such operations. However, SMEs might not have proved their credibility to obtain a bank loan so that they would be coming up to the market with innovative products during the idea stage (Westhead and Storey, 1997).

This situation has brought about various legislative strategies pointed toward developing a solid entrepreneurship ecosystem and aiding the endurance and development of companies, particularly SMEs. These strategies may access to capital, human resource development, technical support and trade, and export promotion (Trong et al, 2017).

There are many examples of such assistance in developed and developing countries. In Chile, for instance, seed-capital-program (SCP) offers non-reimbursable cash subsidy that is intended to support the rapid growth of young SMEs that have a growth potential. The SCP has been declared to be a government program supporting the development of opportunity-driven entrepreneurship, meaning entrepreneurship that stems from a desire for independence, from wanting to increase income or from the existence of a business opportunity not previously envisaged (Blanchflower and Oswald, 1998).

The types of grants that are considered here are oftentimes directly linked to new economic development activity in local communities. In USA, the Tennessee Infrastructure for Industry Program (TIIP) provides infrastructure support only for new and expanding industries. Thus the TIIP is by definition linked to new job creation (Murray and Ullrich, 2005).

Financial support programs focus on a wide spectrum of sectors including agriculture, manufacturing, and services. Grants allocated to agricultural industry have the goal to stimulate innovation; however, small sized farmers may be missing in this puzzle. In order to complete the missing piece of the puzzle, smallholder farmers are now positively treated and encouraged to conduct R&D and to innovate. Support mechanisms stimulate smallholders to pursue improved practices, to become proactive and to engage with research and extension providers. Ton et al. (2013) lays three suggestions of allocating grants to smallholder farmers and their affiliated organizations: vouchers, competitive grants and farmer-led innovation support funds. The executions of this approach in various regions of the world consist of, among others, innovation grant systems in Malawi (Agricultural Input Subsidy Program), Latin America (several Challenge Funds for Farmer Groups), Uganda (National Agricultural Advisory Services), and Colombia (Local Agricultural Research Committees - CIAL).

As mentioned above, there are numerous governmental support programs targeting small businesses almost in any country or region. The World Bank's Impact Evaluation Guidebook (2016) states that development programs and policies are typically designed to change outcomes such as raising incomes, improving learning or reducing illness. The outcomes may not be reflecting the anticipated results; however, the question "Why?" is rarely asked when these policies do not work in practice. In

addition to this, program managers and policy makers are interested in reporting only the inputs and outputs of a program. These inputs and outputs can be listed as the amount spent during the program, the number of textbooks, brochures and other printed materials distributed, the number of people benefitted from the program and so on. In contrary, it is more important to focus on assessing the designated goals introduced at the very beginning of a program.

Impact evaluations are part of a broader agenda of evidence-based policy making. This growing global trend is marked by a shift in focus from inputs to outcomes and results, and is reshaping public policy. Not only is the focus on results being used to set and track national and international targets, but results are increasingly being used by, and required of, program managers to enhance accountability, determine budget allocations, and guide program design and policy decisions.

OECD (2019) defines impact evaluation as an assessment of how the intervention being evaluated affects outcomes, and whether these effects are intended or unintended. The proper analysis of impact requires a counterfactual of what those outcomes would have been in the absence of the intervention. US Environmental Protection Agency has a similar definition: “A form of evaluation that assesses the net effect of a program by comparing program outcomes with an estimate of what would have happened in the absence of the program”.

Impact evaluation of programs puts emphasis on causality and attribution. This method seeks answers to cause-and-effect questions. The way to deal with such circumstances decides the approaches that can be utilized. In order to forecast the causal impact or effect of a program on results, any impact evaluation method chosen must estimate the so-called counterfactual: that is, what would have happened if the program had not been implemented. In practice, impact evaluation expects that the evaluation team finds a comparison group to estimate what would have happened to the program participants without the program (control group), then make comparisons with the treatment group that has received the program (World Bank, 2016).

The questioning of the effectiveness of support programs is on the agenda of not only the developed countries, but also on the agenda of emerging market countries like Turkey. Recently, the debate about how such support programs impact the performances of beneficiaries has erupted. Entrepreneurs in Turkey can benefit from

several types of governmental support programs. The major ones can be listed as KOSGEB (Small and Medium Sized Enterprises Development Organization of Turkey), TUBITAK (The Scientific and Technological Research Council of Turkey), and development agencies.

The governmental institutions not limited to the ones mentioned above currently focus on the outcomes and desire to compare them with the scenario of its absence. This paper is designed to run a counterfactual impact analysis of such support programs, especially the subsidies and financial support received by firms, and reveal the effects of these supports on firm performance, i.e. employment, average labor cost, value added, profits, and export volume in Turkey. These analyses have been conducted through 19 Nace Rev.2 groups of major economic activities, which are statistically classified in European Union since 2006. However, since the manufacturing industry captures 28% of the whole observations and 72.9% of the filtered observations for both the treatment group and control group, this study is intended to focus on this very sector. Manufacturing exports constitute 94% of Turkey's 2018 total export volume according to Turkish Statistical Institute. The intention is to compare a treatment group with a control group. In conclusion, this study has been designed to evaluate and find, if any, the impact of subsidies and/or financial support mechanisms in Turkey's manufacturing industry. This paper will, furthermore, compare and contrast most industrialized regions to the Rest of Turkey. These classifications will cover "Istanbul Province vs Rest of Turkey" and "Marmara Region vs Rest of Turkey".

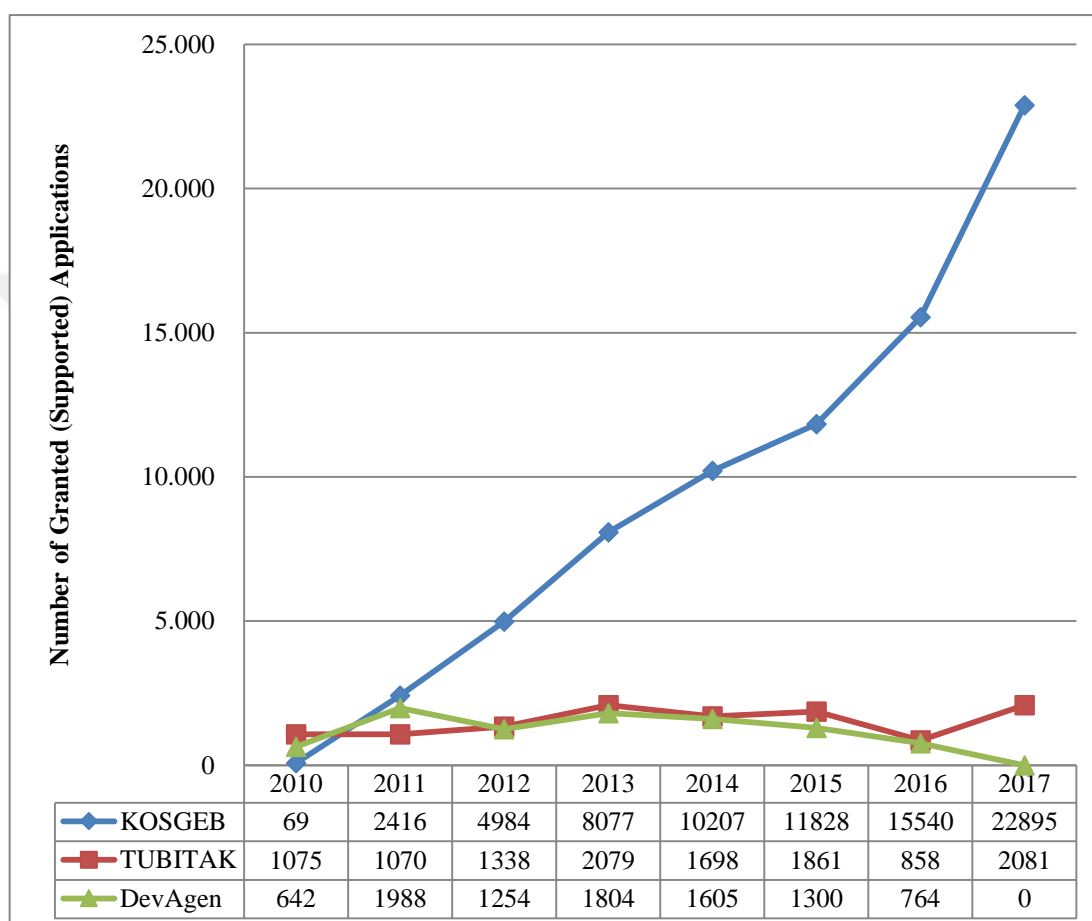
The organization of this chapter is as follows; after this introductory section, next section covers the major financial support mechanisms in Turkey, third section is the review of empirical literature on counterfactual impact evaluation of financial support programs; while the theoretical background and causality are explained in the fourth section, the fifth section presents hypotheses, data, the methodological setup, and empirical results. The conclusion captures the results and policy recommendations.

### **3.2. An Overview of Major Support Programs for Turkish Firms**

Firms in Turkey have several alternatives to benefit from government programs, especially the ones with no reimbursement option, known as financial grants or subsidies. In this section, only the major ones that are predominantly known and

utilized by firms will be nailed down. These are KOSGEB programs, TUBITAK-TEYDEB, and development agency support programs.

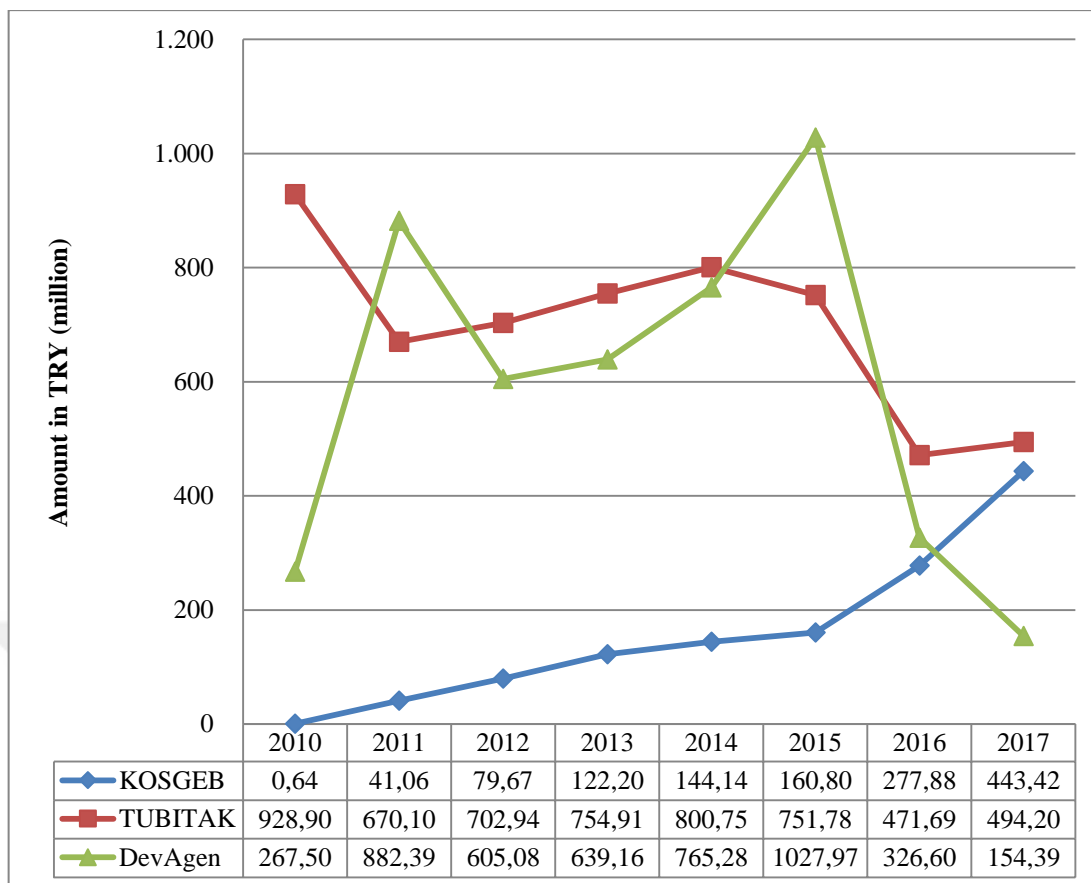
As a snapshot of these major financial support mechanisms, figures 3.1 and 3.2 below summarize the number of certificated projects and the amount of grants (in TRY) allocated to firms.



**Figure 3. 1. Number of Granted (Successful) Applications**

Source: KOSGEB, TUBITAK, Ministry of Industry and Technology.

In figure 3.1, the number of KOSGEB projects has a sharp upward slope; however, TUBITAK's TEYDEB and Development Agencies' call for project proposal programs have relatively flatter slopes. This tells us that there is a growing demand for KOSGEB grants. On the other hand, the applicants have to submit innovative projects to TUBITAK and development agencies; where there is only an entrepreneurial attempt is sufficient for KOSGEB grants.



**Figure 3. 2. Amount of Grant Allocated to Firms in Some Major Financial Support Mechanisms (TRY, million)\***

**Source:** KOSGEB, TUBITAK, Ministry of Industry and Technology.

Base year: 2017=100, producer price index)

\*Figures of Development Agencies' "call for project proposal" programs for 2010-2012 are the total announced numbers. 2013-2017 figures reflect the contracted amounts.

Regarding the amount of grants allocated to firms, development agencies ranked ahead of all other programs in 2011 and 2015; however, ended up being the last in 2017. TUBITAK TEYDEB support is more stable and tops the table in 2017. KOSGEB Entrepreneurship Program has a continuous upward slope. The reason why the number of KOSGEB projects are the highest but the amount allocated is lower than the other programs until 2017 is that KOSGEB is designed to assist small and medium-sized entrepreneurs. Therefore, this program allocates lower amounts per project when compared to development agencies and TUBITAK TEYDEB (See Fig. 3.2).

### **3.2.1. KOSGEB (Small and Medium Sized Enterprises Development Organization)**

KOSGEB was first introduced as KÜSGEM (Small Industry Development Center) by Ministry of Industry and Trade, as a pilot project in the province of Gaziantep in 1973. The project was kicked off within the framework of the International Treaty between Turkey and UNIDO (United Nations Industrial Development Organization). The project was designed to provide service service to industrial SMEs with community facility workshops.

KOSGEB provided services and supports only for the production industry SMEs until 2009. After 2009, KOSGEB enlarged its target population so as to cover all SMEs including service sector due to rising demand.

In 2018 fiscal year, KOSGEB allocated USD 395<sup>11</sup> million financial support to 350,223 enterprises. As can be seen in figures 3.1 and 3.2, the number of beneficiaries in KOSGEB's entrepreneurship support program in 2017 is 22,895, which is well above the other two systems. However, the amount allocated per project is well below when compared to other programs. This outcome stems from the reason that KOSGEB is an institution targeting the growth of SMEs. KOSGEB has several umbrella support mechanisms to meet such demands of SMEs.

As mentioned in the official website of KOSGEB, there are 5 major umbrella support mechanisms, which are listed below.

- Entrepreneurship supports
- Enterprise development, growth and internationalization supports
- Laboratory services
- R&D, technological production and domestication supports
- SME finance supports

### **3.2.2. TUBITAK (The Scientific and Technological Research Council of Turkey)**

TUBITAK is Turkey's leading agency for conducting research, management, and funding. It was founded in 1963 with the mission of advancing science and technology, conducting research, and assisting Turkish researchers. TUBITAK not only supports

---

<sup>11</sup> The average USD/TRY exchange rate for 2018: 4.813 (Source: Central Bank of Turkey).

innovation, academic and industrial R&D studies, but also develops scientific and technological policies, manages R&D institutes, carries out research, technology, and development studies in accordance with national strategies and priorities. In addition to these, TUBITAK funds research projects conducted by universities and other public and private organizations. It also conducts strategic research, creates support programs for the public and private sectors, publishes scientific journals, popular science magazines, and books, organizes science and society activities, and provides scholarships to undergraduate and graduate students.

TUBITAK's TEYDEB (Technology and Innovation Grant Programs) support is distributed to enterprises in order to increase R&D awareness of the private industry and encourage them to invest in R&D and innovation by sharing the potential of risk of failure. As stated in TUBITAK's official website, 18,872 projects of enterprises have been awarded with an approximately USD 3 billion grant under TEYDEB program between 1995 and 2017.

### **3.2.3. Regional Development Agencies**

Regional Development Agencies in Turkey have been a milestone for Turkey's socioeconomic development efforts, encouraging local stakeholders come together and implement innovative projects in order to put strategies into practice. The pilot agencies, Cukurova and Izmir, were established in 2006. The remaining 24 agencies were founded between 2008 and 2010.

The agencies in Turkey are very well known with its financial instruments, also known as 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). Thus, supporting entrepreneurial efforts has been a key element of the Agencies since the law 5449 sets a concrete relationship between regional development and entrepreneurship. During 2008-2017, 17,553 projects have been awarded with about USD 2 billion grant under financial support programs.

### **3.3. Literature Review on Financial Support and SME Performance from the Perspective of Impact Evaluation**

Impact evaluation using comparison groups is an appropriate tool to answer the question "which are the effects on firm performance from obtaining an investment

subsidy?” and more specific questions such as “which type of policy instruments are more effective in subsidizing which type of firms?” Answering these questions is not as easy as it seems. To identify the (causal) effect of a subsidy one must compare the changes observed among supported enterprises (changes in a given indicator over a given period), with the changes that would have been observed in the same time period for the same firms, had they not received the support. This hypothetical change, not observable by definition, is labelled “counterfactual” (ASVAPP, 2012). In this section, empirical studies with counterfactual impact evaluation technique, which is entailed a combination of difference in difference method and focusing on the effectiveness of support programs, are being provided. This section is divided into two parts; one reviewing the studies in developed countries, other reviewing the studies in developing regions.

### **3.3.1. Literature for Developed Countries**

In most studies run for developed countries, grants or subsidies have positive impact on employment, sales and value added. However, there is no significant result for labor productivity. In Italy, for instance, marginal cost per extra job created was higher than the control group; whereas, it is relatively modest in Portugal. Table 3.1 below gives a summary of related empirical studies with a similar methodological setup including the authors, countries, support programs and empirical findings. The rest of this part of the paper includes recent literature for developed countries, in detail.

In his study, Wallsten (2000) asks the question “Do governments’ R&D grant programs increase private R&D?”. Using a dataset of firms involved in the Small Business Innovation Research (SBIR) program, which is recognized as one of the major seed fund program in the US, Wallsten estimates a multi- equation model to test his hypotheses. Firms with more employees and that appear to do more research win more SBIR grants, but the grants do not affect employment. Moreover, the study finds evidence that the grants crowd out firm-financed R&D spending dollar for dollar.

**Table 3. 1. Summary of Recent Empirical Literature for Developed Countries**

DEVELOPED COUNTRIES			
Study	Country	Program	Empirical Findings
Wallsten (2000)	USA	Small Business Innovation Research (SBIR) Program	The study finds evidence that the grants do not affect employment.
Duch et al. (2007)	Spain	Public Subsidy Program	The findings show that recipient firms change their business practices, improve their performance, and increase their value added as a direct result of public subsidy programs.
ASVAPP (2012)	Italy	Law 488 Program	The average impact was positively higher on employment, sales and investment; however, costs per job created, cost per extra euro of sales and cost per extra euro of investment were also higher than the control group.

---

**DEVELOPED COUNTRIES**

---

<b>Study</b>	<b>Country</b>	<b>Program</b>	<b>Empirical Findings</b>
Mamede et al. (2015)	Portugal	Operational Program of the EU Structural Funds	The firms' likelihood of survival after 3 years is up by 11%, and leads to a net creation of 2.1 additional jobs. The average cost per additional job created as a result of incentives was relatively modest.
Karhunen and Huovari (2015)	Finland	R&D Subsidy	The findings show no significant positive effect on labor productivity over the five-year period after a subsidy is granted; nevertheless, subsidies generate a positive employment effect and enhance firm survival.
Bondonio et al. (2016)	Austria, France, Germany, Italy, UK, Spain, Hungary	EU Funds	The results indicate that receiving public support from national funds generates positive increments in employment, sales, and added value, compared to the counterfactual status of the absence of public intervention.

---

Many regional governments, not only in developing countries but also in developed countries, design programs to improve the competitiveness of local firms. Duch et al. (2007) evaluate the effectiveness of public programs whose aim is to enhance the performance of firms located in Catalonia (Spain). The study compares the performance of publicly subsidized companies (treated) with that of similar, but unsubsidized companies (non-treated). Propensity Score Matching (PSM) methodology is used to construct a control group which, with respect to its observable characteristics, is as similar as possible to the treated group, and that allows to identify firms which retain the same propensity to receive public subsidies. Consequently, the findings show that recipient firms, on average, change their business practices, improve their performance, and increase their value added as a direct result of public subsidy programs.

In Italy, the so called Law 488 is the largest Italian enterprise support program of the last two decades, and it has been co-funded by the European Regional Development Fund. The support provided by Law 488 takes the form of project-related non-repayable capital grants. The type of investment projects covered are startups, extension, restructuring, reconversion, reactivation and relocation. According to ASVAPP (2012), based on employment, sales and investment criteria, the findings claim that public subsidies for micro and small firms are more cost effective in the case of Italy; moreover, the results of the analysis support the hypothesis that non-repayable grants may be less effective than repayable assistance in preventing the rent seeking behavior of firms with enough resources to implement the planned investment projects on their own. The average impact was 5 times higher on employment, sales and investment, compared to the scenario of its absence. However, costs per job created, cost per extra euro of sales and cost per extra euro of investment were higher than the control group.

Mamede et al. (2015) prefers to apply a counterfactual approach to evaluate the impact of the main Operational Program of the EU Structural Funds in Portugal during the period 2000-2006 (POE/PRIME) on the performance of beneficiary firms. The study finds that this support program designed to help firms increases their percentage of survival by 11 points after three calendar years, and results in creating 2.1 additional jobs in the same period. The positive results obtained during this study suggest that the general public support for firms' investment in Portugal in 2000-2006 was mostly well

designed, a minimum of within the light of the impact dimensions under analysis. The incentives were particularly effective in the case of firms that are typically more fragile (particularly, new firms and/or firms with low financial autonomy). The paper also finds that the support had a greater impact in the case of large-scale firms, in which the typical cost per additional job created as a result of incentives was relatively modest.

Karhunen and Huovari (2015) investigate the impact of research and development subsidies on labor productivity. To control for selection bias, they analyze firm-level data on Finnish SMEs from 2000 to 2012 and adopt a combined matching and difference-in-differences method. Over a five-year period after a subsidy is granted, the findings demonstrate no substantial increase in labor productivity. The results, however, fluctuate over time and show a 2-4 percent negative effect on SMEs' annual productivity growth, after a couple of years starting from the year subsidy was granted. Nonetheless, the article asserts that subsidies increase firm survival and provide positive employment results. Further investigation demonstrates that subsidies have a positive impact on low-skill enterprises' human capital.

Bondonio et al. (2016) estimates the relationship between public funding and subsidies to firms' innovation and R&D on the one hand and firms' innovation, employment, sales, added value on the other one. More specifically, the study looks at different types of public support programs: i) public support to innovation from national programs; ii) public support to innovation from EU funded programs (i.e. Framework Program 6 and 7); public support to investment and R&D (irrespective of the source). The results indicate that receiving public support from national funds generates positive increments in employment, sales and added value, compared to the counterfactual status of the absence of public intervention. The paper does not find evidence that EU funds have additional impacts on employment, sales or value added (relative to firms receiving only national funding or no funding).

### **3.3.2. Literature for Developing Countries**

In developing countries, employment, sales and diversification of products are found to be affected positively in most studies. However, there is no significant result for labor productivity and/or capital productivity. In some countries, such financial support mechanisms are used as a tool to reduce poverty (Brazil) and increase

development index (Poland and Slovakia). Table 3.2 below gives a summary of related empirical studies with a similar methodological setup including the authors, countries, support programs and empirical findings. The rest of this part of the paper includes recent literature for developing countries, in detail.



**Table 3. 2. Summary of Recent Empirical Literature for Developing Countries**

DEVELOPING COUNTRIES			
Study	Country	Program	Empirical Findings
Soares et al. (2010)	Brazil	Bolsa Familia	Compared to the program's absence, it has been found that these programs had a noteworthy impact on reducing poverty, particularly extreme poverty
Kannebley (2010)	Brazil	Innovation	The accomplishment of technological innovation produces positive and significant impacts on employment, net revenue, labor productivity, capital productivity, and market share of firms.
Michalek (2012)	Poland and Slovakia	Special Accession Program for Agricultural and Rural Development	For Rural Development Index and employment rate, the SAPARD program had a positive impact on the treated regions compared to the control regions.
Arraiz et al. (2014)	Colombia	Government-backed Partial Credit Guarantee	Firms that gain access to credit backed by the NGF were able to grow in terms of both output and employment. However, the study could not find any effect on productivity, wages, or investment.

---

**DEVELOPING COUNTRIES**

---

<b>Study</b>	<b>Country</b>	<b>Program</b>	<b>Empirical Findings</b>
Bonan et al. (2015)	Ethiopia	Agricultural Extension Projects	The program contributes to the diversification of production. There is not any significant impact on total sales and revenues. The study does not focus on the impact on employment or productivity.
Cancino and Bonilla (2015)	Chile	Seed Capital Program	SCP has a positive impact on sales and on the number of employees hired, it does not have such an impact on raising capital after the subsidy.
Kilinc (2019)	Turkey	TUBITAK and KOSGEB Support Programs	KOSGEB support programs have positive impact on employment but generally not on productivity. TUBITAK support has positive impact on R&D and innovation so on "total factor productivity", but not always on employment.

---

Soares et al. (2010) review the targeting performance of Brazil's Bolsa Familia - one of the largest conditional cash transfer programs in the world, benefiting roughly 11 million families - and its impact on inequality, poverty, consumption, education, health care, and labor force participation. Compared to the program's absence, they found out that these programs had a noteworthy impact on reducing poverty, particularly extreme poverty. Bolsa Familia had been effective in both increasing school attendance and decreasing dropout rates. The program had a positive impact on adult labor force participation, and the impact was greater among women.

Kannebley et al. (2010) attempt to assess the economic performance of Brazilian manufacturing firms through a counterfactual analysis of innovation impact. The article compares two groups of firms during 1996-2002: innovators versus non-innovators. It was verified that, on average, the accomplishment of technological innovations produces positive and significant impacts on employment, net revenue, labor productivity, capital productivity, and market share of firms. It was also observed that the conjunction of product and process innovations, relative to other forms of innovation, presents stronger impact on the performance of Brazilian firms.

In recent years the evaluation of EU cofounded programs was assigned particular importance. After the administrative reform of the European Community (Agenda 2000) a periodic evaluation has been extended to all EU policies (Toulemonde et. al., 2002) and recognized as a crucial component of policy development. With the enlargement process of the European Union, the Special Accession Program for Agricultural and Rural Development (SAPARD) was addressed as a key financial instrument to support the beneficiary countries of Central and Eastern Europe in dealing with the structural adjustment in their agricultural sectors and rural areas. In this scope, the impact evaluation of SAPARD was run for Poland and Slovakia. In the study of Michalek (2012), the weights of economic, social, and environmental domains entering the EU Rural Development Index (RDI) (composite indicator) were derived empirically from the econometrically estimated intra and inter regional migration function after selecting the "best" model from various alternative model specifications (e.g. panel estimate logistic regression nested error structure model, spatial effect models, etc). Therefore, mainly the change in RDI Index and unemployment rates were selected as key indicators to make a comparison between treatment and control regions. The SAPARD program had a positive impact on the

treated regions compared to the control regions in terms of rural development and employment rate.

In Colombia, Arraiz et al. (2014) examine the impact of government-backed partial credit guarantees on companies' performance. These guarantees are intended to be automatically given by the National Guarantee Fund (NGF) to businesses who lack sufficient collateral to alleviate credit constraints. This study assembles a panel of firms spanning the years 1997-2007, allowing them to account for observed and unobserved firm characteristics that could influence both program selection and firm performance. Firms that gained access to NGF-backed financing were able to scale up in terms of output and employment, according to the findings. The study, however, found no impact on productivity, wages, or investment.

Agricultural development is central in the debate on the post-2015 development agenda, food security and poverty eradication being directly linked to agricultural production. Development actors are working to translate identified priorities into implementable policies aimed at increasing small farmers' productivity, which is one of the most important barriers to agricultural development. Agricultural extension, therefore, is deemed as a way to transfer innovation. Bonan et al. (2015) underlines the role of impact evaluation methods applied to agricultural development programs, which focus on agricultural extension projects and briefly present the results of a case study in rural Ethiopia. The study finds that the program contributes to the diversification of production, with the average introduction of two more products, which had not been previously cultivated. The impact of vegetable sales from small land extensions, as proposed by the project, remains secondary and does not impact total sales and revenues.

Cancino and Bonilla (2015) analyze the impact on businesses in Chile of the Seed Capital Program (SCP) implemented by Chile's Technical Cooperation Services (SERCOTEC). The objective of this program is to support the growth of a larger number of opportunity-driven enterprises that stand out because of high volumes of sales and a positive impact on employment in each economy (Autio, 2007). In order to do the analysis of the impact of SCP, a counter-factual scenario was used that entailed a combination of the propensity score matching with difference in difference methods. Regarding the findings, the results for the variables of revenues, number of employees and capital raised post-funding are defined to be mixed. The impact of sales

is positive but its statistical significance depends on the model used. With regard to the number of employees, however, the results are positive and statistically significant regardless of the model used. The results also show that participating in the program has no incidence on the probability of later obtaining financing. In this case, it can be seen, in both models, that obtaining the subsidy has a positive and statistically significant impact on the number of workers hired.

Kilinc (2019) aims to assess micro underpinnings of firm innovation and productivity. The empirical analysis is based on the Entrepreneur Information System at the Ministry of Industry and Technology. The study focuses on Turkey's KOSGEB and TUBITAK grants for firms in manufacturing and service sectors. Cofactors are listed as: i) firm age; ii) employment; iii) labor productivity; and iv) capital intensity. Firm performance indicators have been selected as: i) employment (firm size); ii) R&D expenditure; and iii) innovation (patent, trademark, design or model applications). After running the counterfactual impact evaluation and productivity calculations, Kilinc finds out that KOSGEB support programs have positive impact on employment but generally not on productivity. TUBITAK support has positive impact on R&D and innovation so on "total factor productivity", but not always on employment. The impact of support programs differs significantly across 2-digit (NACE Code) industries. While younger firms are defined to have greater contribution into Turkey's innovation performance, they are not very likely to receive TUBITAK support especially in service sectors.

### **3.4. Theoretical Framework**

A microeconomic incentive is a financial benefit, such as a subsidy or a tax break, provided to a business, industry, or sector by a government in order to achieve a specific economic or political goal. An example would be a tax credit for hybrid cars enacted to increase the sales of these cars in order to decrease automotive pollution<sup>12</sup>. Another example would be a development agency grant for an innovative product aimed at import subsidization. KOSGEB's grant programs may be included under this topic since the goals are to decrease unemployment and create more entrepreneurs regardless of their sectoral classification.

---

<sup>12</sup> <http://www.businessdictionary.com/definition/microeconomic-incentive.html> (access Dec 04, 2018).

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. In this section, economic theories behind this study will be presented.

### **3.4.1. Theory of Firm Growth**

Penrose (1959) presents the “Theory of Firm Growth” from a managerial perspective. Penrose describes a firm as a combination of both human and non-human resources under a management with a ranging visionary capability. The underlying proposition is that it is the available unused resources within the firm and the utilization of these unused resources, which determines the future of a firm. Unused resources may originate sales, managerial capacity, research or productive excess capacity. Therefore, it may be concluded that, it is basically up to the managerial capabilities to grow a firm, seek available low-cost or zero-cost financial resources (including subsidies), blend human and non-human resources, and also motivate the labor force.

### **3.4.2. Theory of Economic Development and the Different Roles of an Entrepreneur**

The most well-known economic model that covers entrepreneurship is certainly “the Theory of Economic Development” by Joseph Schumpeter, published in 1911. This theory draws a basic framework for economic development essentials. In addition to Schumpeter, there are other approaches as well. Heber and Link (1988) give an impressive overview over the different roles of an entrepreneur. Table 3.3 exhibits the roles of an entrepreneur in the history of economic theory according to Hebert and Link.

**Table 3. 3. Roles of the Entrepreneur in the History of Economic Theory according to Hebert and Link (1988)**

---

1. The entrepreneur is an uncertainty bearer	7. The entrepreneur is an organizer or coordinator of economic resources
2. The entrepreneur is an innovator	8. The entrepreneur is the owner of an enterprise
3. The entrepreneur supplies financial capital	9. The entrepreneur is an employer of factors of production
4. The entrepreneur is a decision maker	10. The entrepreneur is a contractor
5. The entrepreneur is an industrial leader	11. The entrepreneur is an arbitrageur
6. The entrepreneur is a manager or super-intendent	12. The entrepreneur is an allocator of resources among alternative uses.

---

**Source:** This is a modified version of the table in “Towards an Interdisciplinary Theory of Entrepreneurship” p. 106 (Ripsas, 1998).

In Turkey, in order to benefit from subsidies or financial support, a firm or an entrepreneur must have either a product (prototype) or a project. This means that an entrepreneur must be an innovator. Schumpeter (1934) lays the innovator role of an entrepreneur under five categories:

- Introducing a new good or quality of a good;
- Introducing a new method of production;
- Opening of a new market;
- The utilization of some new source of supply for raw materials or intermediate goods;
- The carrying out of some new organizational form of the industry.

Besides, an entrepreneur needs to supply financial capital. Scarce capital resources would lead an entrepreneur to find alternatives, such as subsidies or financial support (grants). As a decision maker, uncertainty bearer, manager, and employer of factors of production, an entrepreneur should find the best option and alternative financing mechanisms with zero or low-cost.

Consequently, the analysis in this paper will be related to the conceptual frameworks and theories stated above. Regarding the method, which will have links with the economic theory; a counterfactual impact evaluation analysis on subsidies and financial support for firms will be run. The purpose is to find the real impact of subsidies - aimed at supporting firms and easing their access to finance - in order to reveal the potential differences between the pre-funded characteristics of the assisted and non-assisted firms (the non-assisted firms are used in this analysis to estimate the counterfactual: what would have happened to the assisted firms in the absence of support).

### **3.5. Data, Methodology and Empirical Results**

After laying out the theoretical background, this study continues with the empirical analysis with a consideration of the data collected from Turkstat's Industry and Service Statistics. The discussion is anticipated to conclude with the actual estimating equations and a presentation of other findings from regression analyses on manufacturing industry. The regression outcomes will be including the results for "Istanbul Province", "Marmara Region", "Turkey", "Istanbul vs Rest of Turkey" and "Marmara Region vs Rest of Turkey".

#### **3.5.1. Research Hypothesis**

*Null Hypothesis ( $H_0$ ):* Financial support or subsidy allocated to firms has no significant effect on employment, average labor cost, value added per labor, profit per labor, and export per labor.

*Alternative Hypothesis ( $H_A$ ):* Financial support or subsidy allocated to firms has significant effect on employment, average labor cost, value added per labor, profit per labor, and export per labor.

#### **3.5.2. Data**

The data has been provided from Turkish Statistical Institute's Industry and Service Database, covering years from 2011 to 2015, with a base year of 2013. The treatment group is described as firms that receive subsidy or financial support in 2013. Duration of financial support programs/subsidies vary from 3 months to 18 months. Therefore, a two year time frame before and after time zero (2013) has been taken into

consideration. The raw data included 168,676 firm-level entries based on more than 50 variables.

Since the manufacturing industry captures 28% of the whole observations (47,024 out of 168,676) and 72.9% of the filtered observations for both the treatment group and control group (9,948 out of 13,646), this study is intended to focus on this very sector, which constitutes 94% of Turkish exports according to 2018 figures of Turkish Statistical Institute. The data has been classified into regional groups: Istanbul, Marmara and Turkey.

The filtering criteria of firms are listed in table 3.4. After the filtering process, the selected treatment group included 688 firms and the control group included 9260 firms.

**Table 3. 4. Data (Firm) Filtering Criteria**

Years	2011-2015
Name of Sector and Nace Code	Manufacturing (Nace Rev.II: 10.11-33.20)
Firm Activity Period	Must be actively operating from 2011 to 2015.
Control Group	Never received subsidy from 2011 to 2015.
Treatment Group	Received subsidy in 2013, but not received in other years.
Minimum Financial Support Received By Treatment Group	TRY 10,000
Labor Force	Recruit 1-250 employees
Min. Annual Total Labor Cost	TRY 12,203
Max. Annual Total Revenue	TRY 125 million

As mentioned above, this study focuses on SMEs in the manufacturing industry based on Nace Rev. 2 classification between 10.11 and 33.20, as stated in Turkstat's survey questionnaire of Annual Industry and Service Statistics. The SME definition in Turkey was revised in 2018. According to the new definition, an SME is a business that recruits 1-250 employees and has maximum annual total revenue of TRY 125 million.

Recruiting at least one labor per year costs TRY 12,203, based on the 2011 official minimum wage calculation.

### 3.5.3. Descriptive Statistics

The analysis is run through a dependent variable and 3 independent variables. There are 5 different dependent variables; therefore, each individual dependent variable is regressed on these 3 independent variables, which are dummies capturing subsidized firms, year 2015, and the interaction terms of these two. The descriptions of the selected variables are shown in table 3.5.

**Table 3. 5. Description of Variables**

Dependent Variables	laborforce	Average number of employees in a year
	ln_avlabcost	Natural logarithm of average labor cost in a year
	ln_val_add_per_lab	Natural logarithm of value added per labor
	ln_profperlab	Natural logarithm of profit (after tax) per labor in a year
	ln_tot_exp_per_lab	Natural logarithm of annual exports per labor
Independent Variables	subsidized	Dummy for subsidized firms
	y2015	Dummy for year 2015
	y2015subsidized	Dummy for interaction term of subsidized firms and year 2015

This study selects 2013 as its base year, when the treatment group receives subsidy. In this regard, the summary of main covariates in the final dataset is shown in table 3.6. 2011 and 2015 are the two periods selected to compare treatment group and control group.

**Table 3. 6. Summary of the Main Covariates in the Final Dataset**

Time	Covariates	Mean		
		Control	Treatment	Total
Year 2011 (t-1)	Labor Force	53.7068	76.01453	55.2496
	LN Av. Labor Cost	9.542702	9.961455	9.571663
	LN Value Added Per Labor	9.722917	10.24629	9.762634
	LN Profit Per Labor	8.032224	8.424469	8.061233
	LN Tota Export Per Labor	9.474333	9.673208	9.48221
Year 2015 (t+1)	Labor Force	62.64395	74.73692	63.4803
	LN Av. Labor Cost	10.06143	10.08479	10.06305
	LN Value Added Per Labor	10.30728	10.37155	10.31168
	LN Profit Per Labor	8.32585	8.477166	8.336477
	LN Total Export Per Labor	9.655583	9.845029	9.669894

**Source:** Turkstat (base year: 2013).

### 3.5.4. Methodology

#### 3.5.4.1. Counterfactual Impact Evaluation: Average Treatment Effect

The World Bank defines impact evaluation as “*a systematic identification of the effects positive or negative, intended or not on individual households, institutions, and the environment caused by a given development activity such a program or project*” (World Bank, 2004). Impact evaluation includes counterfactual analysis, which is a comparison between what the outcome was and what would the outcome be in the absence of the intervention. Impact evaluation involves contextual and qualitative analyses.

Impact evaluation is the general framework for both evaluating data over time in terms of goals, indicators, and outcomes and seeking tools that may enhance the quality of the program (Luque-Fernandez, 2014). In this study, counterfactual impact analysis,

classically known as Neyman-Rubin Counterfactual Framework, will be followed to estimate the impact of public incentives on the performance of firms. In other words, the goal is to answer the question: what would have happened if the government support program for firms had not existed.

Neyman-Rubin Framework is becoming increasingly popular in recent years. In this framework, there are two potential outcomes. The difference between two potential outcomes is defined as a causal effect, although only one of the two potential outcomes is observed. (Sekhon, 2007).

Let  $Y_{i1}$  denote the potential outcome for unit  $i$  if the unit receives treatment, and let  $Y_{i0}$  denote the potential outcome for unit  $i$  in the control group. Then the treatment effect of observation  $i$  is:

$$\tau_i = Y_{i1} - Y_{i0} \quad (3.01)$$

Let  $T_i$  be a treatment indicator: labeled as 1 when  $i$  is in the treatment regime and 0 otherwise.

The observed outcome for observation  $i$  is as follows:

$$Y_i = T_i Y_{i1} + (1 - T_i) Y_{i0} \quad (3.02)$$

From an expectation point of view, the distributions of both observed and unobserved variables in both groups are equal. Treatment assignment is independent of  $Y_0$  and  $Y_1$ , for instance  $\{Y_{i0}, Y_{i1} \perp T_i\}$ , where  $\perp$  denotes independence (Dawid, 1979). Hence, for  $j = 0, 1$

$$E(Y_{ij} | T_i = 1) = E(Y_{ij} | T_i = 0) = E(Y_i | T_i = j) \quad (3.03)$$

Then the average treatment effect is estimated by:

$$\tau = E(Y_{i1} | T_i = 1) - E(Y_{i0} | T_i = 0) \quad (3.04)$$

$$\tau = E(Y_i | T_i = 1) - E(Y_i | T_i = 0) \quad (3.05)$$

Equation (3.05) then defines the intention-to-treat (IIT) estimand. The outcomes for the treated and control individuals are:

$$Y_i(1) = Y_i(T = 1) \quad \text{for some treatment variable } T \text{ (Treated)} \quad (3.06)$$

$$Y_i(0) = Y_i(T = 0) \quad \text{for some treatment variable } T \text{ (Control)} \quad (3.07)$$

The Potential Outcomes for an individual  $i$  if he/she received treatment or control are:

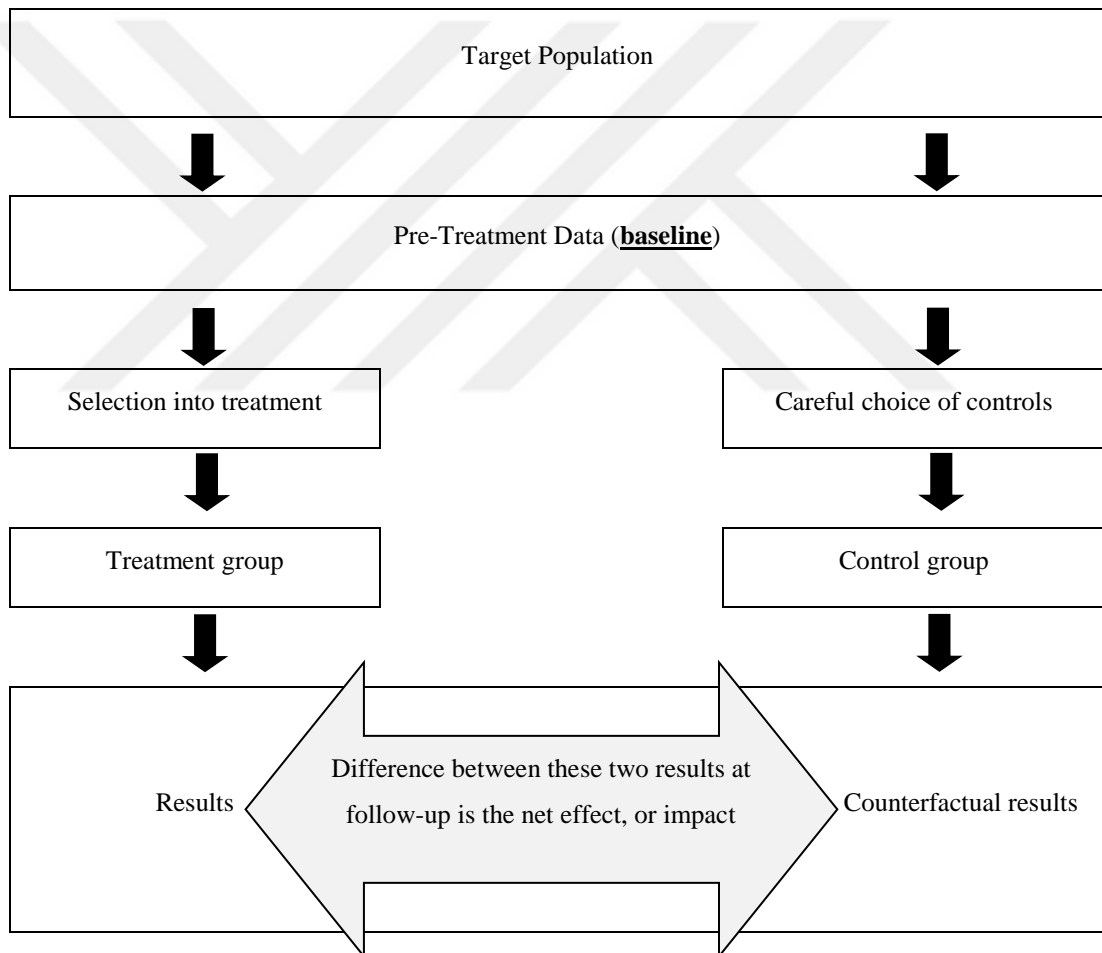
$Y_i(1) = Y_i(T = 0)$  is the counterfactual or potential outcome for  $Y_i(1) = Y_i(T = 1)$  (Treated) (3.08)

$Y_i(0) = Y_i(T = 1)$  is the counterfactual or potential outcome for  $Y_i(0) = Y_i(T = 0)$  (Control) (3.09)

However, we only observe:

$Y_i(1) = Y_i(T = 1)$  and  $Y_i(0) = Y_i(T = 0)$  (3.10)

Figure 3.3 below exhibits the stylized quasi-experimental design with treatment and control groups.



**Figure 3. 3. Stylized Quasi-Experimental Design with Treatment**

**Source:** Directorate-General for Employment, Social Affairs and Inclusion, European Commission, 2012.

### 3.5.4.2. Difference-in-Differences

In this study, the difference in differences estimation will be used. The motivations to use this estimation are that the regression will have free estimates of standard errors, reduced bias from potential differences in time trends, and increased precision of estimate.

Trend in control group approximates what would have happened in the treatment group in the absence of treatment or intervention. In the following tables and expressions “C” represents the control group which did not get treatment, “Tr” represents the treatment group, “Pre” represents the calculations before treatment, and “Post” represents calculations after treatment.

$$\text{Difference in Differences} = (\bar{y}_{Tr,Post} - \bar{y}_{Tr,Pre}) - (\bar{y}_{c,Post} - \bar{y}_{c,Pre}) \quad (3.11)$$

Table 3.7 shows us the means of control group and treatment group. In the rows, control and treatment groups are listed. In the columns, pre and post periods are listed. The visual exhibition of difference in differences estimation is displayed in table 3.8.

**Table 3. 7. Means of control and treatment groups**

	Pre	Post
Control	$\bar{y}_{c,Pre}$	$\bar{y}_{c,Post}$
Treatment	$\bar{y}_{Tr,Pre}$	$\bar{y}_{Tr,Post}$

$$y = \beta_0 + \beta_1 D^{post} + \beta_2 D^{TR} + \beta_3 (D^{post} * D^{TR}) + \beta_4 X + e \quad (3.12)$$

where  $D^{post}$  is a dummy variable for the post or previous measurement,  $D^{TR}$  is a dummy variable for treatment or control groups, and  $(D^{post} * D^{TR})$  is an interaction term.

**Table 3. 8. A Visual Exhibition of Difference in Differences Estimation**

Y	$D^{post}$ (Pre=0)	$D^{post}$ (Post=1)	Difference
$D^{TR}$ (control=0)	$\beta_0$	$\beta_0 + \beta_1$	$\beta_1$
$D^{TR}$ (Treatment=1)	$\beta_0 + \beta_2$	$\beta_0 + \beta_1 + \beta_2 + \beta_3$	$\beta_1 + \beta_3$

While estimating any causal effect, there are three assumptions necessary to hold: exchangeability, positivity, and Stable Unit Treatment Value Assumption (SUTVA).

The difference in difference estimation also requires the following criteria:

- Intervention unrelated to outcome at baseline (allocation of intervention was not determined by outcome)
- Treatment/intervention and control groups have Parallel Trends in outcome (see below for details)
- Composition of intervention and comparison groups is stable for repeated cross-sectional design (part of SUTVA)
- No spillover effects (part of SUTVA)

The parallel trend assumption is seen as a vital assumption of all. It ensures the internal validity of difference-in-difference models and is the most difficult to achieve. It requires that the difference between the 'treatment' and 'control' groups be constant over time in the absence of treatment. Although there is no statistical test for this assumption, visual inspection can be beneficial when there are observations at multiple time points. It has also been suggested that the shorter the time period tested, the more likely the assumption is to be correct. Here, this study compares and contrasts these two groups for the years 2011 and 2015. The intervention is assumed to be done in 2013. Violation of parallel trend assumption will lead to biased estimation of the causal effect<sup>13</sup>.

<sup>13</sup> Mailman School of Public Health, Columbia University  
<https://www.mailman.columbia.edu/research/population-health-methods/difference-difference-estimation> access on July 14th, 2019)

### 3.5.5. Estimating Equations and Empirical Results

Revising the equation (5.11) according to the descriptions of this paper:

$$y = \beta_0 + \beta_1 y_{2015} + \beta_2 subsidized + \beta_3 (y_{2015} * subsidized) + e \quad (3.13)$$

where  $y_{2015}$  is a dummy variable for the post or previous measurement, *subsidized* is a dummy variable for treatment or control groups,  $(y_{2015} * subsidized)$  is an interaction term., and  $e$  is the white noise error term. To be clear, the coefficient of  $(y_{2015} * subsidized)$  is the value we are interested in ( $\beta_3$ ).

In summary, this paper aims to find the difference between the treatment group and the control group, how they diverged from each other, before and after receiving subsidy. Figure 3.4 exhibits the time frame of the treatment group versus the control group.

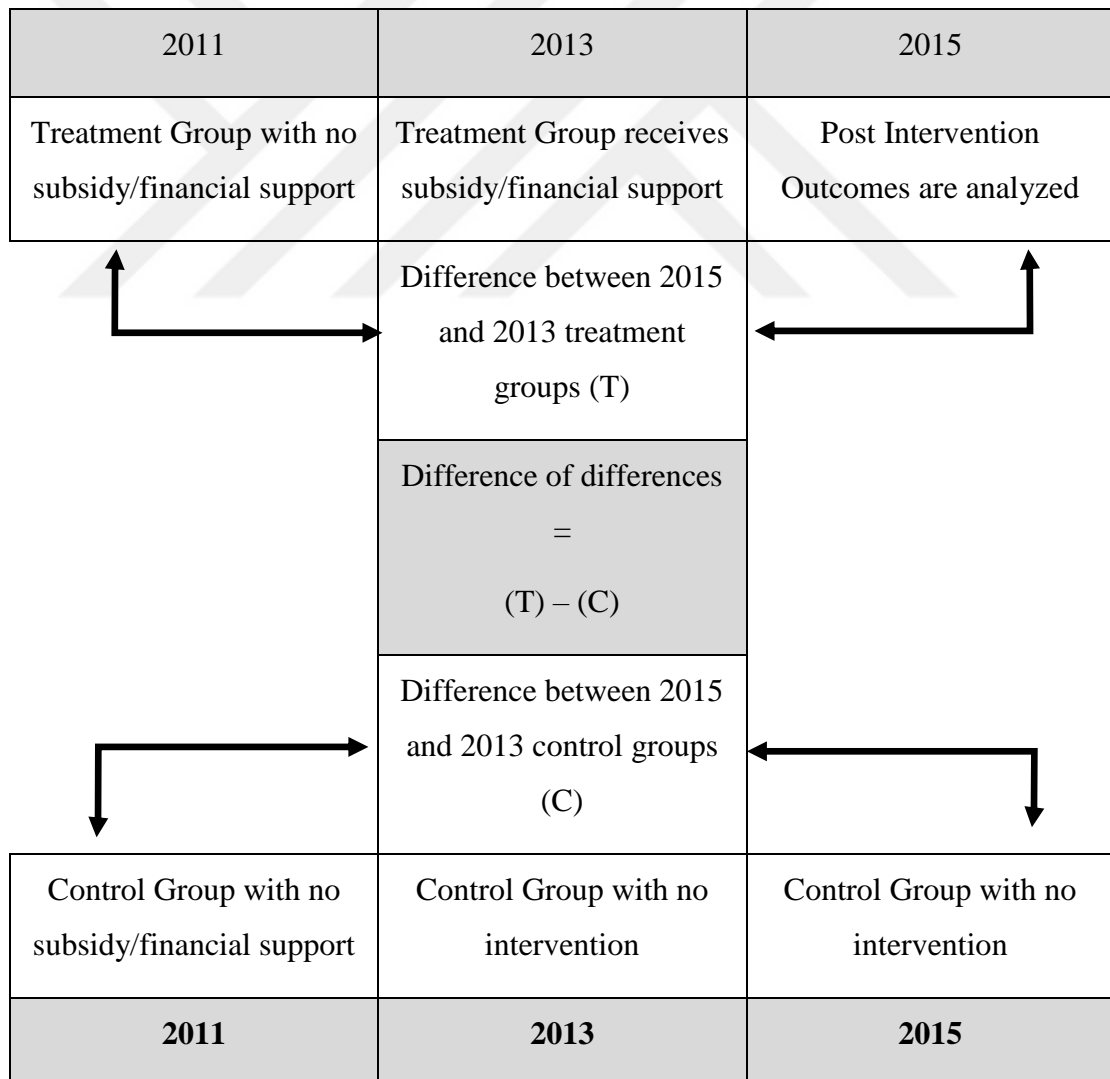


Figure 3. 4. Time Frame of Treatment Group vs Control Group

### 3.5.6. Regression Outcomes

The regression outcomes of Manufacturing Industry<sup>14</sup> (Nace Rev. 2 sector of Manufacturing Industry includes codes from 10.11 to 33.20) have been analyzed. The reason why this study mainly focuses on the Manufacturing Industry is that this sector constitutes 72.9% of observations. There are 3 different regression outputs, which cover consolidated data on Turkey as a whole, only Istanbul Province vs Rest of Turkey, and only Marmara Region vs Rest of Turkey.

**Table 3. 9. Regression Outcomes of Manufacturing Industry SMEs in Turkey**

	(1)	(2)	(3)	(4)	(5)
	Labor Force	LN Av. Labor Cost	LN Value Added Per Labor	LN Profit Per Labor	LN Total Export Per Labor
	b/t	b/t	b/t	b/t	b/t
y2015 (Control Group in 2015)	8.937*** (13.86)	0.519*** (85.29)	0.584*** (35.67)	0.294*** (12.03)	0.081 (0.62)
Subsidized (Treatment Group in 2011)	22.31*** (12.87)	0.419*** (25.61)	0.523*** (12.18)	0.392*** (6.09)	0.101 (0.65)
y2015_subsidized (Treatment Group in 2015)	-10.21*** (-4.17)	-0.395*** (-17.10)	-0.459*** (-7.53)	-0.241** (-2.65)	0.172 (0.93)
Constant	53.71*** (117.82)	9.543*** (2218.85)	9.723*** (821.26)	8.032*** (458.74)	9.572*** (449.90)
<i>N</i>	19896	19896	16861	16671	10090
<i>R</i> <sup>2</sup>	0.019	0.278	0.075	0.011	0.001

b: coefficient t: t-stat

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

<sup>14</sup> List of Nace Rev.2 Sectors (Codes shown in paranthesis): "Accommodation and Food Services (55.10-56.30)", "Administrative and Supportive Services (77.11-82.99)", "Culture, Art, Entertainment, Leisure and Sports (90.01-93.29)", "Construction (41.10-43.99)", "Education (85.10-85.60)", "Electricity, Gas, Steam and Conditioning (35.11-35.30)", "Health and Social Services (86.10-88.99)", "ICT (58.11-63.99)", "Manufacturing Industry (10.11-33.20)", "Mining and Quarrying (05.10-09.90)", "Motor Vehicles (45.11-45.40)", "Occupational, Scientific and Technical Operations (69.10-75.00)", "Other Services (95.11-96.09)", "Real Estate (68.10-68.32)", "Retail Trade (47.11-47.99)", "Transport and Storage (49.10-53.20)", "Water Provision, Sewage and Waste Management (36.00-39.00)", "Wholesale Trade (46.11-46.90)".

As known, Istanbul (TR10) and also Marmara Region (TR10, TR21, TR22, TR41 and TR42) are the most industrialized regions in Turkey<sup>15</sup>. Tables 3.9, 3.10, 3.11, 3.12 and 3.13 exhibit the Stata regression outputs.

The regression results of the complete dataset covering Turkey's all 26 NUTS-II regions are shown in table 3.9. The independent variable of "y2015" is the year dummy that shows us if the observation is from year 2015 (=1) or not (=0). The "subsidized" variable, in general, will take care of the inherent differences between our treatment and control group. Finally, there is an interaction term called "y2015\_subsidized", which is going to give us our actual estimated treatment effect.

The positive coefficients of y2015 independent variable show that the number of employees recruited, average labor cost, revenue per labor, value-added per labor, and profit per labor have been increasing significantly, regardless of subsidies/grants. Firms including control and treatment have an upward trend independent of the allocated grants. Then, finally, the interaction term "y2015\_subsidized" here gives us negative and significant coefficients for each of the dependent variables, except for total exports per labor. This result suggests that the subsidy/financial support by itself decreases the value of every single dependent variable except the insignificant ones. In the regression table, it is seen that only exports per labor values have insignificant outcomes.

Table 3.10 shows us the regression results of the dataset covering TR10 Istanbul region. Istanbul by itself captures 40.1% of the total observations. The y2015 independent variable has positive coefficients. It can be interpreted that the number of labor recruited, average labor cost, value added per labor, and profit per labor have been significantly rising between 2011 and 2015, regardless of the allocated financial support. The interaction term "y2015\_subsidized" here gives us negative and significant coefficients for average labor cost and value-added per labor. On the other hand, number of labor recruited, profit per labor and total exports per labor have insignificant outcomes. Therefore, the results suggest that the subsidy/financial support by itself decreases the value of every single dependent variable except the insignificant ones. Regarding subsidized firms in the post-treatment period; number of labor recruited, export per labor and profit per labor have insignificant results.

---

<sup>15</sup> NUTS I, II, and II statistical classification of regions in Turkey is shown in Appendix.

**Table 3. 10. Regression Outcomes of Manufacturing Industry SMEs in Istanbul (TR10)**

	(1)	(2)	(3)	(4)	(5)
	Labor Force	LN Av. Labor Cost	LN Value Added Per Labor	LN Profit Per Labor	LN Total Export Per Labor
	b/t	b/t	b/t	b/t	b/t
y2015 (Control Group in 2015)	6.912*** (7.02)	0.520*** (53.07)	0.564*** (22.46)	0.284*** (7.31)	0.0876 (0.34)
Subsidized (Treatment Group in 2011)	23.01*** (7.51)	0.474*** (15.56)	0.470*** (6.20)	0.212 (1.80)	0.0969 (0.35)
y2015_subsidized (Treatment Group in 2015)	-7.927 (-1.84)	-0.417*** (-9.71)	-0.354** (-3.26)	-0.0844 (-0.51)	0.111 (0.35)
Constant	53.29*** (76.82)	9.586*** (1389.40)	9.771*** (540.96)	8.023*** (289.74)	9.663*** (315.64)
<i>N</i>	7986	7986	6826	6658	4704
<i>R</i> <sup>2</sup>	0.016	0.272	0.073	0.009	0.000

b: coefficient t: t-stat

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

The regression results of the dataset covering Turkey's 25 NUTS-II regions (TR10 Istanbul region is excluded) are shown in table 3.11. Here, 5,955 firms and 11,910 observations have been included. The y2015 independent variable has positive and significant coefficients on the number of employees recruited, average labor cost, value added per labor, and profit per labor. It can therefore be interpreted that all firms including treatment and control have an upward slope over time. The interaction term "y2015\_subsidized" here gives us negative and significant coefficients for each of the dependent variables, except total exports per labor. This result suggests that the subsidy/financial support by itself has a negative effect on the value of every single dependent variable except the insignificant ones. Values of export per labor, similar to all other regression outcomes, have insignificant results.

**Table 3. 11. Regression Outcomes of Manufacturing Industry SMEs in Turkey less Istanbul (TR10)**

	(1)	(2)	(3)	(4)	(5)
	Labor Force	LN Av. Labor Cost	LN Value Added Per Labor	LN Profit Per Labor	LN Total Export Per Labor
	b/t	b/t	b/t	b/t	b/t
y2015 (Control Group in 2015)	10.31*** (12.12)	0.519*** (67.43)	0.600*** (27.77)	0.300*** (9.55)	0.152 (079)
Subsidized (Treatment Group in 2011)	21.89*** (10.35)	0.407*** (21.26)	0.560*** (10.68)	0.468*** (6.10)	0.145 (0.77)
y2015_subsidized (Treatment Group in 2015)	-11.71*** (-3.91)	-0.388*** (-14.31)	-0.510*** (-6.88)	-0.310** (-2.84)	0.196 (0.87)
Constant	54.00*** (89.54)	9.513*** (1743.99)	9.689*** (619.12)	8.039*** (355.70)	9.489*** (321.31)
<i>N</i>	11910	11910	10035	10013	5386
<i>R</i> <sup>2</sup>	0.021	0.288	0.077	0.012	0.001

b: coefficient t: t-stat  
\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Turkey’s Marmara Region (NUTS-II: TR10, TR21, TR22, TR41, and TR42) is the most industrialized region of the country. Besides Istanbul, there are Kocaeli, Bursa, Sakarya and Tekirdag provinces, which are seen as manufacturing hubs for exports.

The regression results covering Marmara Region are shown in table 3.12. Here, these 5 NUTS-II regions possess 55% of our observations (10,960 out of 19,896). The positive and strongly significant coefficients of y2015 independent variable show that number of employees recruited, average labor cost, value added per labor, and profit per labor are increasing over time, independent from getting subsidized or not. Firms had positive signs between 2011 and 2015. Regarding the interaction term, “y2015\_subsidized”, negative and strongly significant coefficients on the number of labor recruited, average labor cost, and value added per labor exhibit a downturn for

firms that had received grants in 2013. This result suggests that the subsidy/financial support by itself has a negative impact on the value of every single dependent variable except the insignificant ones. Exports per labor and profit per labor have insignificant results.

**Table 3. 12. Regression Outcomes of Manufacturing Industry SMEs in Marmara Region (TR10, TR21, TR22, TR41, and TR42)**

	(1)	(2)	(3)	(4)	(5)
	Labor Force	LN Av. Labor Cost	LN Value Added Per Labor	LN Profit Per Labor	LN Total Export Per Labor
	b/t	b/t	b/t	b/t	b/t
y2015 (Control Group in 2015)	8.314*** (9.61)	0.520*** (61.37)	0.559*** (26.44)	0.277*** (8.13)	0.0157 (0.06)
Subsidized (Treatment Group in 2011)	23.12*** (9.09)	0.448*** (17.98)	0.490*** (8.10)	0.278** (2.82)	0.0161 (0.07)
y2015_subsidized (Treatment Group in 2015)	-8.948* (-2.50)	-0.406*** (-11.59)	-0.394*** (-4.58)	-0.141 (-1.02)	0.182 (0.69)
Constant	54.03*** (88.43)	9.604*** (1604.89)	9.803*** (643.72)	8.073*** (331.07)	9.640*** (360.26)
<i>N</i>	10960	10960	9410	9079	6168
<i>R</i> <sup>2</sup>	0.018	0.266	0.073	0.008	0.000

b: coefficient t: t-stat

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

The regression results of the dataset covering Turkey's 21 NUTS-II regions (TR10, TR21, TR22, TR41, and TR42 are excluded) are shown in table 3.13. Likewise, there are positive and strongly significant coefficients of y2015 independent variable. Checking on the whole dataset, it can be interpreted that the number of employees recruited, average labor cost, value added per labor, and profit per labor have rising trends over time, regardless of being a treated firm or a control firm. The "y2015\_subsidized" variable reflects negative and significant coefficients for four of

the five dependent variables, which are the number of labor force, average labor cost, value added per labor, and profit per labor. This result suggests that the subsidy/financial support by itself decreases the value of every single dependent variable except the insignificant ones. Exports per labor, similar to the other regression outcomes, have insignificant results from the perspective of supported firms.

**Table 3. 13. Regression Outcomes of Manufacturing Industry SMEs in Turkey less Marmara Region (TR10, TR21, TR22, TR41, and TR42)**

	(1)	(2)	(3)	(4)	(5)
	Labor Force	LN Av. Labor Cost	LN Value Added Per Labor	LN Profit Per Labor	LN Total Export Per Labor
	b/t	b/t	b/t	b/t	b/t
y2015 (Control Group in 2015)	9.722*** (10.06)	0.518*** (62.00)	0.620*** (24.20)	0.315*** (9.06)	0.213 (1.01)
Subsidized (Treatment Group in 2011)	21.75*** (9.17)	0.419*** (20.44)	0.588*** (9.59)	0.505*** (6.02)	0.227 (1.05)
y2015_subsidized (Treatment Group in 2015)	-11.60*** (-3.45)	-0.389*** (-13.36)	-0.528*** (-6.08)	-0.333** (-2.79)	0.164 (0.64)
Constant	53.30*** (77.85)	9.465*** (1599.17)	9.617*** (517.60)	7.981*** (319.12)	9.461*** (270.57)
<i>N</i>	8936	8936	7451	7592	3922
<i>R</i> <sup>2</sup>	0.021	0.315	0.079	0.015	0.002

b: coefficient t: t-stat

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

### **3.6. Conclusion**

The positive performance of businesses in the economy is one of the key factors influencing economic development and growth. A better economic environment is created by the establishment of new firms, the scaling up of present firms, and assisting the fragile ones to survive in the market. In this framework, SMEs are regarded as the primary engine of economic growth.

Porter (1990) puts forward that a nation's standard of living depends on the capacity of its companies to achieve high levels of productivity – and to increase productivity over time. A nation's companies must relentlessly improve productivity in existing industries by raising product quality, adding desirable features, improving product technology, or boosting production efficiency. From a critical perspective, Turkish Businessmen's Association (Goker, 2003) emphasizes the spirit of innovative entrepreneurship. Financial support with no reimbursement is defined as a tool to stimulate innovation. However, innovation has to be sustained as a culture. New ideas have to be rapidly converted to into new innovations; and such innovations have to be commercialized. While commercializing products, intellectual property rights (patent, utility model, brand etc.) can be seen as performance indicators.

In each case, one of the most important barriers for a new business project is the lack of financial resources or limited access to finance. In order to tackle such challenges, numerous institutions including governments and governmental organizations implement programs to foster employment of more labor, export volume, total profits, value added, and so on. Therefore, subsidies are being allocated to firms in order to help them overcome their financial obstacles and promote their growth and development.

In recent years, especially in the new millennium, the effectiveness of subsidies on firm performances has been started to be studied frequently. Taxpayers question the real impact of such subsidies on firms. In line with this questioning, this paper intends to measure the effectiveness of subsidies across regions of Turkey. A counterfactual impact evaluation has been carried out in order to assess the impact of subsidies in a broad perspective among firms operating in manufacturing industry.

Our results show that the number of labor recruited and value added per labor rose from 2011 to 2015, in general, regardless of regional differences and getting subsidized or not. These results tell us that even though employment level is rising, average labor cost is also rising. This outcome may stem from two different reasons. First is the increasing trend of minimum wage. There is a 47% rise in minimum wage between 2011 and 2015. Second, the skilled workforce needed for the implementation of projects may demand higher wages. Even though the average number of total employees rise over two periods, Turkey's unemployment rate experienced ups and downs, starting from 9.8% in 2011, and finalized at 10.3% in 2015. When it comes to profit per labor, regression outputs give us insignificant results.

Regarding the financial support programs and subsidies, our results proved that the treatment group faces negative consequences. Even though the magnitudes vary across Istanbul, Marmara Region, and Turkey, the signs are consistently negative.

Compared to the studies on developing countries where grant or subsidy has positive and significant impact on employment, our dataset and output have shown a completely different scenario, which has negative effects on employment. Treated firms' labor force still increases from 2011 to 2015; however, it doesn't reflect the anticipated outcomes. The control group presents a higher employment level between the two periods. Furthermore, the grant tools used in Turkey usually target entrepreneurship and innovation. In some countries, such financial support mechanisms are used as a tool to reduce poverty (Brazil) and increase social and economic development (Poland and Slovakia).

In most studies conducted for developed countries, financial support has a positive impact on employment and value-added. Our study, based on Turkstat's dataset, depicts again a contradictory scenario. Even though there is an upward trend in employment and value-added, the treated firms lag behind the control group. Regarding the labor cost, in the case of Italy, for instance, cost per extra job created was higher than the control group; whereas, it is relatively modest in Portugal. This is the same outcome we had in this study since the treated group has the opportunity to employ high-skilled labor through financial support mechanisms.

It has to be taken into consideration that some studies signal potential flaws of the difference-in-differences model. They mark other potential factors affecting firms'

performance. This model assumes that firms, whether control or treatment, experience the same business path and face similar consequences.

In conclusion, subsidies and financial support programs in Turkey may not exhibit the desired results. Numerous institutions offer numerous support programs, which are very hard to keep track of. From a broader and strategic perspective, a new umbrella organization, acting as a one-stop-shop, can conduct all the support mechanisms. Thus, entrepreneurs would have only one institution or online platform to submit documents. This new umbrella institution can draw a new road map by collecting data, analyzing each support program and revise current programs. Moreover, state institutions may test the effectiveness of alternative mechanisms apart from grants. Such alternatives may be expressed as venture capital or angel investment funds. Due to the nature of grants or subsidies, firms take it as dumb money. Therefore, SMEs often does not intend to continue growing, innovating and commercializing their products after the utilization of such financial tools. Rather, an angel investment or venture fund may be a good alternative as an example of injecting smart money into SMEs. Via the injection of smart money, firms would not only have access to finance, but also expand their network, increase managerial capabilities, and have the opportunity to grab a global vision (Tam, 2017).

## References

- 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, No. 1, pp. 23-45.
- Arráiz, I., Meléndez, M., and Stucchi, R. (2014), “Partial credit guarantees and firm performance: evidence from Colombia”, *Small Business Economics*, Vol. 43, No. 3, pp. 711-724.
- ASVAPP (Associazione per lo Sviluppo della Valutazione e l’Analisi delle Politiche Pubbliche) (2012), “Counterfactual Impact Evaluation of Cohesion Policy: Impact and Cost-Effectiveness of Investment Subsidies in Italy”, *Final Report to DG Regional Policy*, Torino, Italy.
- Autio, E. (2007), “Global Report on High-Growth Entrepreneurship”, *Babson College, London Business School and Global Entrepreneurship Monitor*, London, UK.
- Blanchflower, D.G. and Oswald, A.J. (1998), “What makes an entrepreneur?”, *Journal of Labor Economics*, Vol. 16, No. 1, pp. 26-60.
- Bonan, J., Pareglio, S., and Rotondi, V. (2015), “The Role of Impact Evaluation of Agricultural Development Projects”, *Rivista Internazionale di Scienze Sociali*, Vol. 123, No. 4 (October-December), pp. 369-380.
- Bondonio, D., Biagi, F., and Stancik, J. (2016), “Counterfactual Impact Evaluation of Public Funding of Innovation, Investment and R&D”, *JRC Technical Reports*, European Commission, <https://ec.europa.eu/jrc/en/publication/counterfactual-impact-evaluation-public-funding-innovation-investment-and-rd> (access on April 11, 2019)
- Business Dictionary: <http://www.businessdictionary.com/definition/microeconomic-incentive.html> (access Dec 04, 2018)
- Cancino, C. A. and Bonilla, C. A. (2015), “The impact of government support programs for the development of businesses in Chile”, *Management Decision*, Vol. 53 Iss 8 pp. 1736 – 1754.
- Chudnovsky, D., López, A., Rossi, M. A., and Ubfal, D. (2008), “Money for Science? The Impact of Research Grants on Academic Output”, *Fiscal Studies*, Vol. 29, No. 1, pp. 75-87.
- David, P., Hall, B., and Toole, A. (2000), “Is public R&D a complement or substitute for private R&D? A review of the econometric evidence”, *Research Policy*, Vol. 29, pp. 497- 529.
- Dawid, A. P. (1979), “Conditional Independence in Statistical Theory”, *Journal of the Royal Statistical Society, Series B* Vol.41, No. 1, pp. 1–31.
- Development Agencies Annual Report (2017), Directorate General of Development Agencies, Ministry of Industry and Technology, Ankara, Turkey.
- 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.

- European Commission (2012), “Design and Commissioning of Counterfactual Impact Evaluations”, Directorate-General for Employment, Social Affairs and Inclusion, Unit A3.
- Gertler, P. J., Sebastian, M., Patrick, P., Laura, B. R., and Christel, M. J. V. (2016), “Impact Evaluation in Practice”, Second Edition, Washington, DC: Inter-American Development Bank and World Bank.
- Goker, A. (2003), “Ulusal Inovasyon Sistemi”, *TUSIAD Yayinlari*, pp.19-122.
- Hebert, R. F. and Link, A. N. (1988), “In Search of the Meaning of Entrepreneurship”, *Small Business Economics*, Vol. 1, pp. 39-49.
- Jehle, G. and Reny, P. J. (2011), “Advanced Microeconomic Theory”, *Pearson*, Hampshire, UK.
- 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.
- Karhunen, H. and Huovari, J. (2015), “R&D subsidies and productivity in SMEs”, *Small Business Economics*, Vol. 45, No. 4, pp. 805-823.
- 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), pp. 1278-1284.
- Kilinc, U. (2019), “Innovation Support and Firm Performance: An Assessment of Turkey’s Manufacturing and Service Sectors”, *Central Bank of the Republic of Turkey – World Bank Joint Conference: Drivers of Firm Performance in Turkey (January 10)*, Ankara, Turkey.
- KOBI AS (2011), “Girisim Sermayesi – Presentation”, Bolgesel Gelismenin Finansmaninda Girisim Sermayesinin Rolü Sempozyumu (April 14), Ankara Development Agency & State Planning Organization, Ankara, Turkey.
- Koch, Meinrad (2015), “Crossing the Valley of Death: Exploring Commercialization of Food Startups in Switzerland”, *Unpublished Master Thesis*, Zurich University, Zurich, Switzerland.
- KOSGEB, Annual Reports (2010-2011-2012-2013-2014-2015-2016-2017-2018), <https://www.kosgeb.gov.tr/site/tr/genel/detay/349/plan-raporlar-ve-mali-tablolar> (accession November 14, 2019)
- \_\_\_\_\_, Support Services, <http://en.kosgeb.gov.tr/site/tr/genel/destekler/3/supports-services> (access on March 27, 2019)
- Luque-Fernandez, M. A. (2014), “A Counterfactual Approach for Impact Evaluation”, *Presentation on Counterfactual Framework, IE Designs & Methods, Case Studies*, Department of Epidemiology, Harvard School of Public Health, Boston, MA, USA.
- Mailman School of Public Health, Columbia University: <https://www.mailman.columbia.edu/research/population-health-methods/difference-difference-estimation> (access July 14, 2019)
- Mamede, R. P., Fernandes, T., and Silva, A. A. (2015), “Counterfactual Impact Evaluation of EU Funded Enterprise Support in Portugal”, *Dinamia’CET (Center for Socioeconomic and Territorial Studies)*, WP No. 2015/05.

- Michalek, J. (2012), “Counterfactual Impact Evaluation of EU Rural Development Programmes – Propensity Score Matching Methodology Applied to Selected EU Member States”, *JRC Scientific and Policy Reports*, European Commission, Vol.2.
- Ministry of Industry and Technology of Turkey, Annual Reports of Development Agencies (2010-2011-2012-2013-2014-2015-2016-2017)
- Murray, M. N. and Ullrich, L. D. (2005), “The Effect of State Grants, Arc Grants, and CDB Grants on County-Level Economic Growth”, *Proceedings at Annual Conference on Taxation and Minutes of the Annual Meeting of the National Tax Association*, National Tax Association, Vol. 98, pp. 380-385.
- OECD, Outline of Principles of Impact Evaluation, <http://www.oecd.org/dac/evaluation/dcdndep/37671602.pdf> (access on March 27, 2019)
- Porter, M. (1990), “The Competitive Advantage of Nations”, *Harvard Business Review*, March-April 1990, pp. 73-91.
- Ripsas, S. (1998), “Towards an Interdisciplinary Theory of Entrepreneurship”, *Small Business Economics*, Vol. 10 (2), pp.103-115.
- Rosenbaum, P. R. and Rubin, D. B. (1983), “The Central Role of the Propensity Score in Observational Studies for Causal Effects”, *Biometrika*, Vol. 70 (1), pp. 41–55.
- Penrose, E. T. (1959) , “The Theory of the Growth of the Firm”, John Wiley & Sons, New York, USA.
- Schumpeter, J. A. (1911), “Theory of Economic Development”, *Cambridge: Harvard University Press*.
- \_\_\_\_\_ (1934), “Theory of Economic Development: An inquiry into Profits, Capital, Credit, Interest and the Business Cycle”, *Cambridge: Harvard University Press*.
- Sekhon, J. S. (2007), “The Neyman-Rubin Model of Causal Inference and Estimation via Matching Methods”, *The Oxford Handbook of Political Methodology*.
- Soares, F. V., Ribas, R. P., and Osório, R. G. (2010), “Evaluating the Impact of Brazil's Bolsa Familia: Cash Transfer Programs in Comparative Perspective”, *Latin American Research Review*, Vol. 45, No. 2, pp. 173-190.
- Tam, E. (2017), “Smart Money or Dumb Money?”, *Hong Kong Economic Journal*, Vol. Sep.26.
- TEYDEB (2018), “Presentation of Statistics”, TUBITAK, [https://www.tubitak.gov.tr/sites/default/files/292/teydeb\\_istatistikler\\_2018\\_8mart.pdf](https://www.tubitak.gov.tr/sites/default/files/292/teydeb_istatistikler_2018_8mart.pdf) (access on March 30, 2019)
- Ton, G., de Grip, K., Klerkx, L., Rau, M-L., Douma, M., Friis-Hansen, E., Triomphe, B., Waters-Bayer, A., and Wongtschowski, M. (2013), “Effectiveness of innovation grants to smallholder agricultural producers: An explorative systematic review”, EPPI-Centre, *Social Science Research Unit*, Institute of Education, University of London.

- Toulemonde, J., Summa, H., and Usher, N. (2002), “Three layers of quality assurance: Would this help provide EU policy makers with the evaluative information they need?”, *European Evaluation Society Conference*, Seville, Spain.
- Trong C. N., Van H. V., and Bartolacci, F. (2017), “Government support and firm financial performance: New evidence from a transitional economy”, *Munich Personal RePEc Archive*, Paper No. 81752.
- TUBITAK: <https://www.tubitak.gov.tr/en/about-us/content-who-we-are> (access on March 28, 2019)
- Wallsten, S. (2000), “The effects of government-industry R&D programs on private R&D: the case of the Small Business Innovation Research program”, *RAND Journal of Economics*, Vol. 31, No. 1, pp.82-100.
- Westhead, P. and Storey, D. J. (1997), “Financial constraints on the growth of high technology small firms in the United Kingdom”, *Applied Financial Economics*, Vol. 7(2), pp. 197-201.
- World Bank (2004), “Monitoring and Evaluation”, *Operations Evaluation Department Knowledge Programs and Evaluation Capacity Development Group (OEDKE)*, Washington, D.C., USA.

## **4. STARTUP PERFORMANCE FROM AN ECONOMIC DEVELOPMENT PERSPECTIVE: IMPACT EVALUATION AFTER FUNDING STAGE**

### **4.1. Introduction**

In public debates, the term “entrepreneurship” is now being heard as a buzzword. It is told to be an essential driver of societal health and wealth, and a formidable engine of economic growth. It promotes the innovation required not just to exploit new opportunities, promote productivity, and create employment, but also to help address some of society’s toughest challenges as stated by the United Nations Sustainable Development Goals (Bosma et al, 2019).

Schumpeter (1934) considers entrepreneurship as an important mechanism for economic development through employment, innovation and welfare effects. Small and medium sized enterprises (SMEs) are the main drivers of these effects. According to the World Bank, SMEs account for the majority of businesses worldwide. They represent about 90% of businesses and more than 50% of employment worldwide<sup>16</sup>.

SMEs are defined as non-subsidiary and independent firms which are categorized under certain criteria. The SME definition in Turkey was revised on 24 June 2018 by the Official Gazette No. 30458. According to the new definition, an SME is a business that recruits 1-250 employees (same in the EU) and has maximum annual total revenue of TRY 125 million. However, some countries prefer to set the limit at 200 employees, whereas the US classifies SMEs as firms with fewer than 500 employees.

Many governments, NGOs, international organizations, and academia consider entrepreneurship as an important part of the solution to create jobs, contribute to economic development, end poverty and seek innovative products for the world’s long-lasting challenges. Therefore, such organizations financially support entrepreneurs, and mostly SMEs, to achieve these goals. Even the approach to the

---

<sup>16</sup> <https://www.worldbank.org/en/topic/sme/finance> (access on March 15, 2020) .

concept of entrepreneurship converges among countries, the tools being used while supporting SMEs vary across countries.

However, there is a growing concern and questioning of the effective use of such mechanisms in recent years. Should governments allocate grants to SMEs, or should they work on another support tool? Should governments support all SMEs or just startups? It is now mostly debated that governments may adopt a new approach on this issue. This study intends to explore the effectiveness of SMEs from a different perspective. Rather than focusing on traditional SMEs, performance of startups will be neatly analyzed.

#### **4.1.1. What is a Startup?**

The term “startup” has been being heard with a rising frequency over the past decade. Governments prepare strategies and action plans in order to increase the number of startups and support the entrepreneurship ecosystem. So, what does a “startup” mean? According to Merriam-Webster, a start-up means “the act or an instance of setting in operation or motion” or “a fledgling business enterprise”. The American Heritage Dictionary suggests it is “a business or undertaking that has recently begun operation”. While launching a new firm, an entrepreneur takes a number of factors into consideration. Startups are often defined as SMEs with a potential to grow rapidly. Steve Blank<sup>17</sup>, a Silicon Valley entrepreneur and adjunct professor of entrepreneurship at Stanford University, defines a startup as an organization formed to search for a repeatable and scalable business model. This definition emerges from Silicon Valley, where numerous businesses have transformed into unicorns<sup>18</sup> in the past few decades.

#### **4.1.2. How Do Startups Diverge From Traditional SMEs?**

Startups and SMEs can look very similar to an outsider. Both are small companies that have been built from nothing by an entrepreneur to fill a gap in the market. Both are focused on growth, profitability and survival. However, there are a few, but important, distinguishable features (Harris, 2016).

How a startup diverges from a traditional SME is that startups strive to find innovative solutions to universal problems. Startups have business models with a problem-solving

---

<sup>17</sup> <https://steveblank.com/2010/01/25/whats-a-startup-first-principles/> (access on March 15, 2020)

<sup>18</sup> A unicorn is a business that is valued more than USD1 billion.

mindset; furthermore, they have innovative products (goods or services) that allow them to have monopolistic power in the market. The European Union points out the main differences between a startup and SME in three concepts, which are “growth and scalability”, “the relationship with funding” and “planning for the end, or exit strategy”<sup>19</sup>. SMEs target profits from day one (short-term strategies), whereas startups take action with a long-term view.

#### **4.1.3. A Regional Approach: What is a Start-up Ecosystem?**

A region or city’s economy is connected to the regional startup<sup>20</sup> ecosystem because of two reasons. First, a region accommodates all kinds of parties that are part of that ecosystem, such as large firms and high schools, but also some innovation clusters and knowledge parks. Second, many employees might be working in a city, but living in the periphery (Startup Amsterdam, 2019).

A start-up ecosystem involves startups and a range of supporting organizations. The ecosystem allows parties to interact for two common purposes: creating new startups and granting a suitable environment for them to grow. As stated in the Startup Amsterdam’s Action Program<sup>21</sup>, such organizations can be divided into a number of categories: (1) universities, (2) supporting organizations such as incubators, accelerators, and co-working spaces, (3) investors, (4) multinationals, (5) service providers and (6) research organizations. Each organization is focused on a specific part of the ecosystem or assists a start-up in a specific phase of its growth.

An incubator<sup>22</sup> is a co-working space geared toward speeding up the growth and success of startup and early-stage firms. Incubators are often a good path to capital from angel investors, governments, economic-development organizations, and other investors. An accelerator tends to focus on providing startups with mentorship, advice, and resources to help them succeed, including a Demo Day. A Demo Day is a one-day event focusing the attention of investors on startups through hosting a series of investments pitches, again from startups to investors<sup>23</sup>.

---

<sup>19</sup> [https://www.ttu.ee/public/a/arikorralduse-instituut/Startup\\_Manual\\_final.pdf](https://www.ttu.ee/public/a/arikorralduse-instituut/Startup_Manual_final.pdf)

<sup>20</sup> In this study, startups ecosystem covers both startups and scaleups.

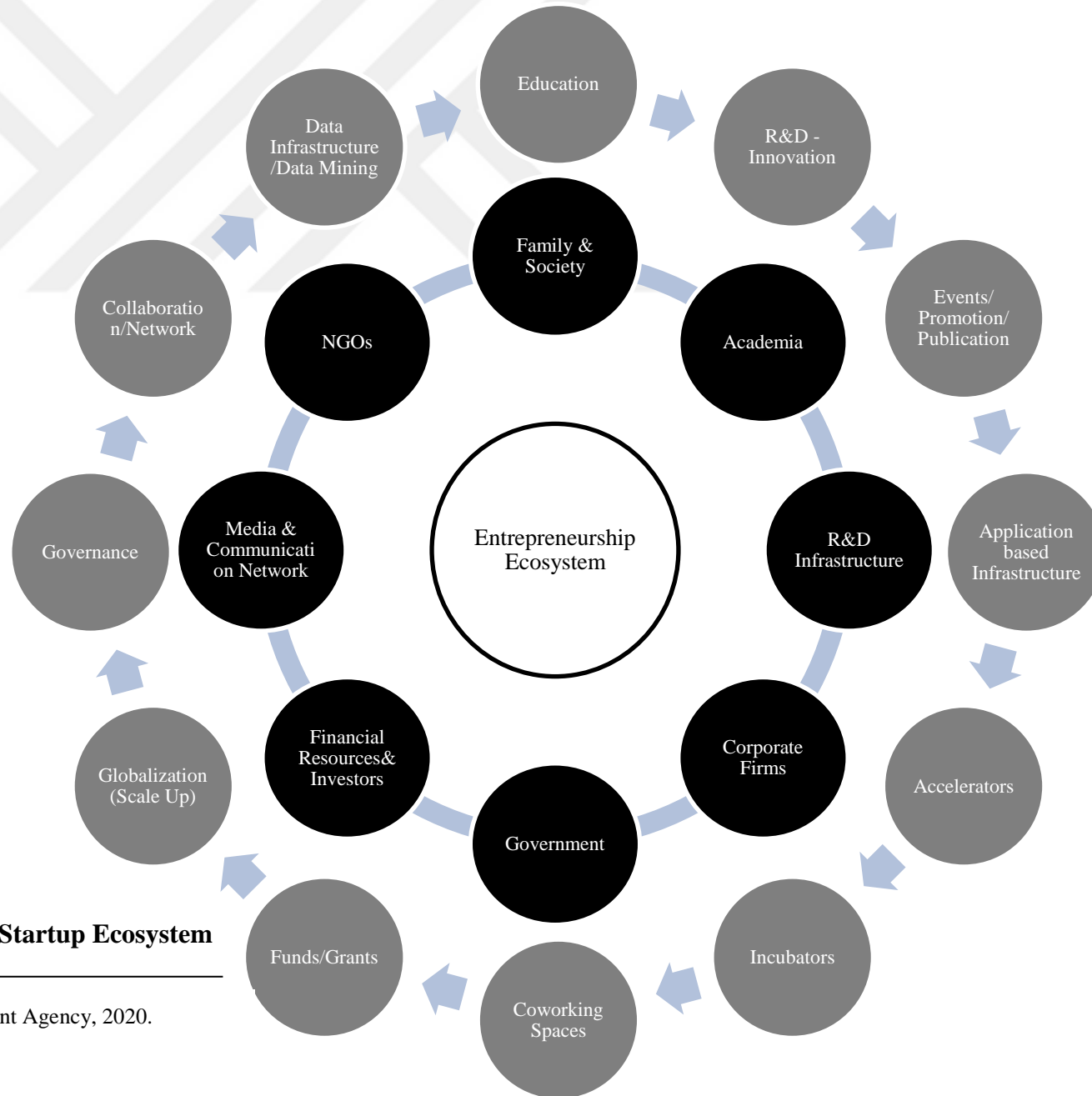
<sup>21</sup> Startup Amsterdam Action Programme, 2018.

<sup>22</sup> <https://www.entrepreneur.com/article/52802> (access on April 11, 2020)

<sup>23</sup> <https://fundersclub.com/learn/startup-accelerators-and-incubators/startup-accelerators-and-incubators-overview/what-is-a-startup-accelerator-or-incubator/> (access on May 01, 2020)

From a broader perspective, an ecosystem involves several institutions, networks, regulatory bodies, and so on. Figure 4.1 exhibits the major players and decision-makers in a startup ecosystem. These players are categorized under two tiers. The first tier consists of the basic players that are essential for an entrepreneur. The second tier complements the first one with the opportunities presented. These opportunities may include, but not limited to, globalization programs, number of funds (venture capital funds, private equities, and angel investors), accelerators, co-working spaces and incubators (Istanbul Development Agency, 2020).





**Figure 4. 1. Major Players in a Startup Ecosystem**

Source: Istanbul Development Agency, 2020.

#### **4.1.4. Why are Startups Important?**

There is no doubt that startups are important for an economy and a nation's economic prosperity. The discussion emerges in terms of the value-added, employment, creation of wealth, better standards of living, and economic growth.

Research Data of the Global Entrepreneurship Monitor<sup>24</sup> show that an entrepreneur (a startup) can create three times more jobs than an average entrepreneur and fifteen times more jobs than a low potential entrepreneur (traditional business). The reason is that innovation is at the heart of the entrepreneurial spirit; therefore, startups play a vital role in finding new solutions to old problems.

According to Shabangu (2014), startup entrepreneurship is crucial because of innovations, new jobs, and bringing competitive dynamics into the business environment. Startup firms are thus those that have ambition and potential to become gazelles that can, with quick growth, create a large number of new jobs. This is often, but not always, the case for firms from high-tech industries. From the perspective of Digital Edenz (2018), a global digital marketing platform, many startups have introduced technologies like the internet of things, artificial intelligence, and robotics. This is an indicator that most startups operate in the ICT sector.

#### **4.1.5. Startup Ecosystem in Turkey**

According to Turkstat, Turkey has an official population of 83.6 million in 2020, with half of that population under the age of 32, giving the country the largest youth population in the European continent. According to the Turkish Trade Registry Gazette, 85,263 new firms were established in Turkey in 2019. Out of these 85,263 firms, 35,836 were founded in Istanbul, which makes the city host 42% of the total new firms. As mentioned above, not all these firms are regarded as startups. After the filtering criteria, only 265 of them (established in 2019) are regarded as startups. Out of these 265 startups, 191 of them were headquartered in Istanbul (startups.watch, 2019).

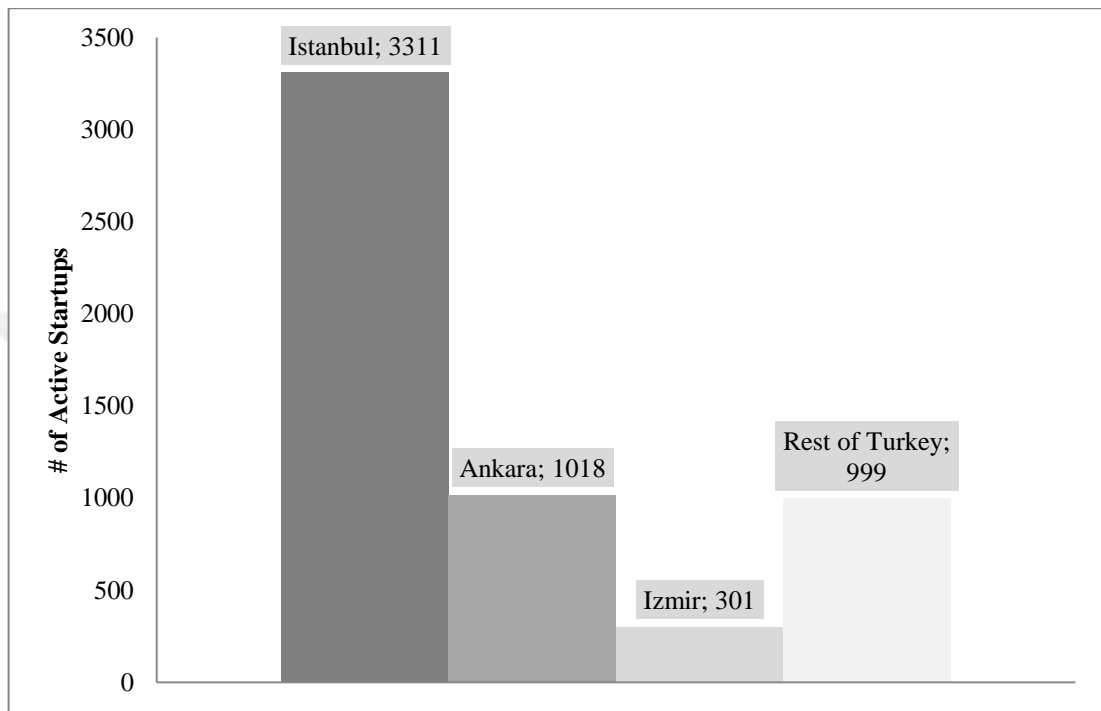
According to Startups.watch<sup>25</sup> there are 5,629 actively operating startups in Turkey as of 2019 end. When it comes to comparing the cities of Turkey, Istanbul is again by far

---

<sup>24</sup> <https://www.gemconsortium.org/data>, (accessed on February 12, 2021)

<sup>25</sup> Startups.watch is a Turkish startup ecosystem intelligence platform.

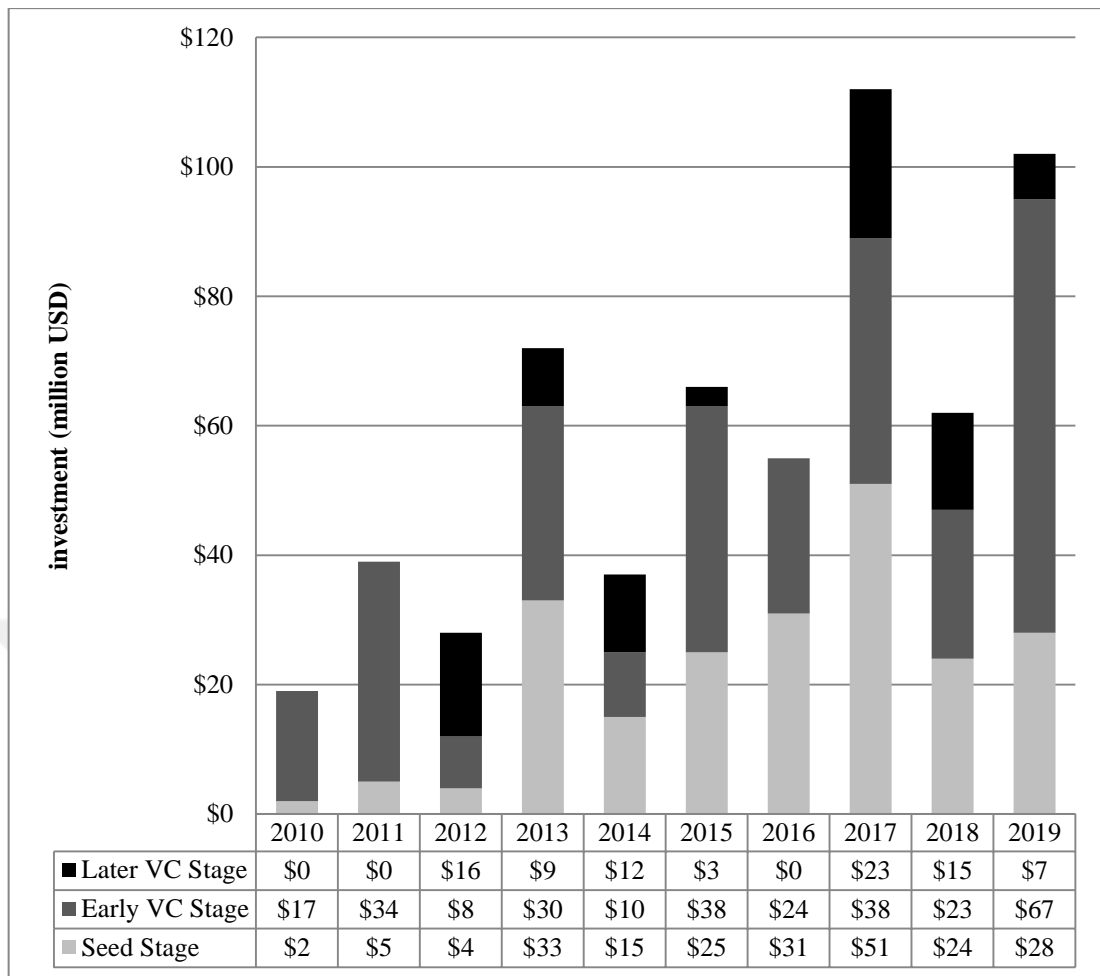
the number one city hosting the most startups. Istanbul is home to 3,311 startups whereas Ankara has 1,018 and Izmir has 301 active startups. 999 startups are distributed over 78 cities in Turkey. Figure 4.2 shows the distribution of startups across these three major cities and the rest of Turkey.



**Figure 4. 2. Number of Startups across Cities in Turkey, as of 2019 end**

Source: Startups.watch, 2020.

When it comes to the question “What are the major city-selection criteria entrepreneurs consider while establishing their businesses?”, there are several answers. The most important answer is that researchers should evaluate the entrepreneurship ecosystem in the overall. The ecosystem was discussed in detail in the previous section. The maturity of the ecosystem plays a vital role. The decision-making process ends with the ease of access to capital. Figure 4.3 lays out the magnitude of investment made by investors on startups from 2010 to 2019.



**Figure 4. 3. Investment Volume on Startups by Stages, 2010-2019 (million USD)**

Source: Startups.watch, 2020.

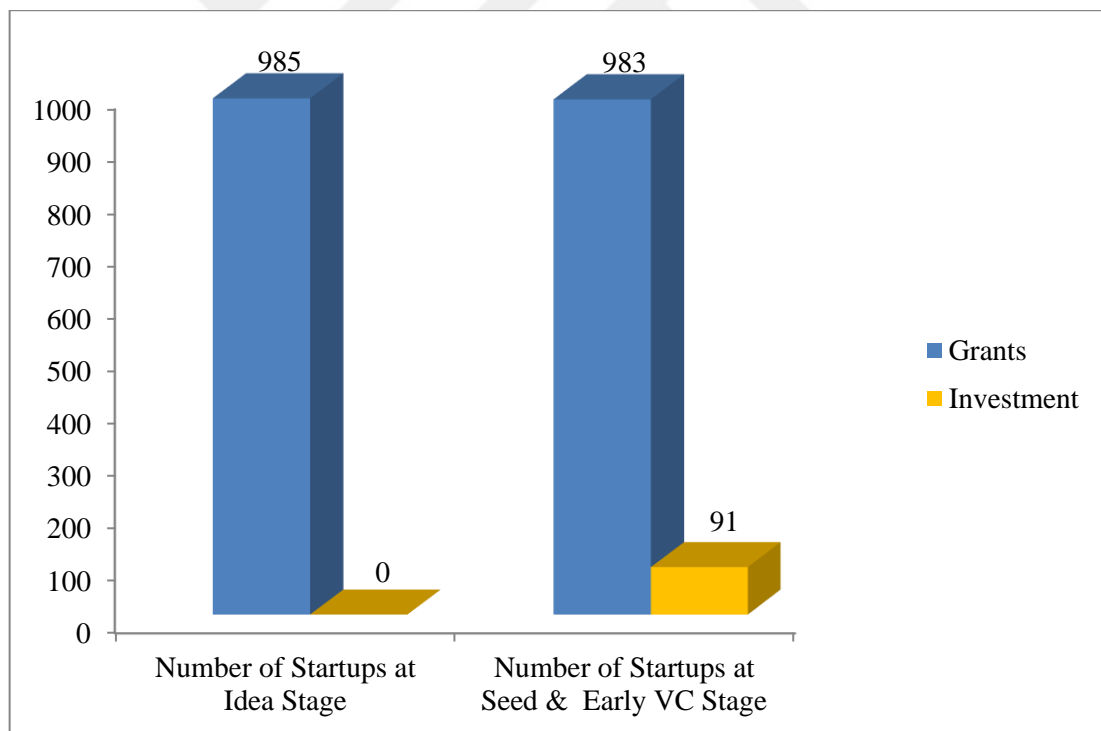
Seed stage includes the funding round used to reach product/market fit. The startups at this stage have a working product and some paying customers with some early metrics. Seed stage size is generally USD 200 thousand per startup in Turkey. Early VC stage involves deals which are used to scale up startups. Startups at this stage have achieved product/market fit and have repeated customers. This round size is generally USD 1 million per startup in Turkey. It is usually the first round of financing that a startup receives from a venture capital firm. Later VC stage captures the funding rounds with higher valuations compared to preceding stage (Presidency of The Republic of Turkey – Investment Office, 2019).

Interpreting the numbers in figure 4.3, the startup ecosystem in Turkey started making headlines around the world after it was announced that the Turkish online delivery

platform Yemeksepeti was sold for USD 589 million to the Germany's Delivery Hero in 2015 (Endeavor Turkey, 2019).

2017 was the year when later VC stage investment (USD 23 million) and seed stage investment (USD 51 million) peaked. Regarding the early VC stage, 2019 became the year with the highest volume, USD 67 million. According to the total volume by year, 2017 was again the top year with USD 112 million. These investment amounts are coming from equity funds, which can be summarized as angel investors, venture capital (VC) funds and private equity.

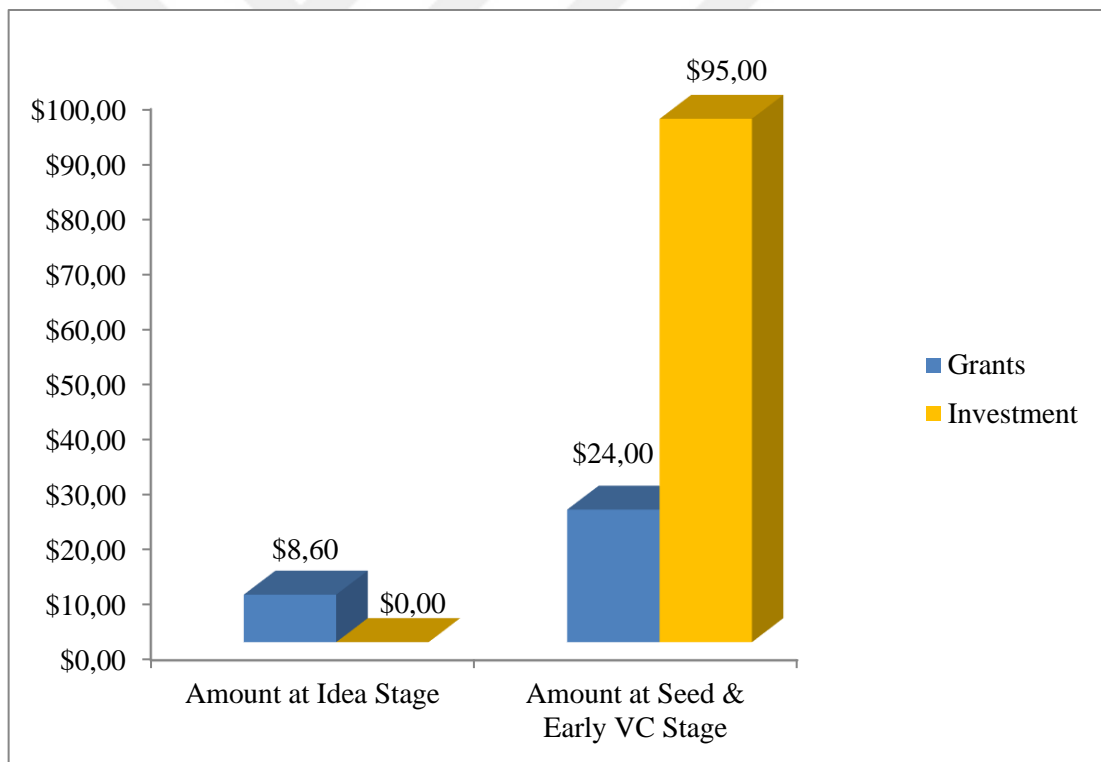
Investment volume in each stage and year seems to have fluctuated due to various reasons. Geopolitical instabilities among Turkey's neighbors and currency crisis in 2018 (which led to around 40% depreciation) may be classified as the two fundamental ones. Since then, valuations of startups and investment volume in USD terms dropped significantly.



**Figure 4. 4. Idea Stage vs. Seed & Early VC Stage: Number of Granted Startups (by government) & Invested Startups (by angel investors & VCs), 2019**

Source: Startups.watch, 2020.

Regarding the role of government funding, or let's say grants, there is a different approach when compared to equity funds including angel investors and VCs. It can be interpreted from figure 4.4 and figure 4.5 that startups received USD 8.6 million of government grants at the idea stage in 2019. At the idea stage, entrepreneurs are mainly in the research and development phase and might not possess a marketable product. At the idea stage, it can be stated that equity funds are risk-averse and might be unwilling to invest in any of these 985 startups. When it comes to seed and early stage funding, government funding is only 20% of the total volume. 983 startups received USD 24 million in 2019. On the other hand, equity funds invest in only 91 startups but with a record level of USD 95 million in 2019. In these figures grants indicate the funds allocated by KOSGEB and TUBITAK TEYDEB, whereas the amount of investment indicates the funds allocated by angel investors and venture capital funds.



**Figure 4. 5. Idea Stage vs. Seed & Early VC Stage: Amount of Grant Received by Startups (by government) & Amount of Investment Received by Startups (by angel investors & VCs), million USD, 2019**

Source: Startups.watch, 2020.

#### 4.1.6. Milestones for Government Support in the Turkish Startup Ecosystem

The Turkish Startup Ecosystem has a long history. However, when it comes to the government support for startups, the first remarkable step was taken in 2012 with TUBITAK's BIGG support program for startups at the idea stage. Table 4.1 below shows the prominent milestones for government support in Turkish Startup Ecosystem.

**Table 4. 1. Milestones for Government Support in Turkish Startup Ecosystem**

Year	Description
2012	Grant Programs for Startups at Idea Stage
2013	Accreditation of Angel Investors
	Mentorship Support Program
	Supporting Entrepreneurship Courses
2014	Supporting Technology Funds
2015	Supporting Accelerators
2016	Supporting Growth Funds
	Supporting International Accelerators
2018	Venture Capital Funding Program
2019	Grant for Development of Startups
	Equity Based Crowdfunding
2020	Establishment of National Funds
	Supporting Regional Funds: Fund of Funds

**Source:** Startups.watch, 2019; Istanbul Development Agency and the Ministry of Industry and Technology, 2020.

In 2013, Ministry of Treasury and Finance started issuing certification to angel investors. This was regarded as a crucial step towards differentiating between real investors and so-called investors. Regarding mentorship, which is an important element of startup ecosystem, the government developed and implemented a monitoring mechanism for entrepreneurs. Moreover, entrepreneurship certificate program was kicked off in universities. This helped students to learn and grasp the business culture and regulations in Turkey. During 2014, Technology Transfer Accelerator Turkey Project, which was co-financed by the EU and Turkey under the instrument for Pre-Accession Assistance funds and managed by European Investment Fund, was launched.

TUBITAK continued supporting the ecosystem players in 2015. This time, accelerators were supported through screening and organizing acceleration programs for startups at idea stage within the framework of 1512 program. Next year, the Turkish Growth and Innovation Fund was established by the European Investment Fund, Ministry of Treasury and Finance, KOSGEB, and Turkish Industrial Development Bank (TSKB). After supporting domestic acceleration programs, KOSGEB started supporting accelerators abroad for the benefit of startups that aim to expand overseas and globalize their businesses.

By 2018, a promising startup ecosystem was formed. From then, TUBITAK started supporting Technology Transfer Offices cooperating with Venture Capital Funds (Tech-InvestTR). In 2019, KOSGEB started allocating grants within the framework of Entrepreneurship Development Program.

Crowdfunding had always been a vital concept for developing ecosystems. Communique on Equity Crowdfunding<sup>26</sup> numbered III-35/A.1 was issued by the Capital Markets Board of Turkey. This regulation paved the way for the establishment of several Crowdfunding platforms.

In 2020, Ministry of Industry and Technology has announced its own fund. This fund was meant to support and invest in promising startups in the Anatolian part of Turkey. Furthermore, another milestone was set in the same year. Istanbul Development Agency has announced a support call for funds. The focus was to provide easier access

---

<sup>26</sup> According to Meriam Webster Dictionary, crowdfunding is the practice of obtaining needed funding (as for a new business) by soliciting contributions from a large number of people especially from the online community.

to finance for startups. The Agency's goal was to activate the "fund of funds" model in Istanbul.

As of 2020, it was found out that the government-run programs listed in table 4.1 are still running without any exception. The reason might be that the Turkish startup ecosystem has started undergoing a revolution where all scopes of the ecosystem needs fundamental support mechanisms.

#### **4.1.7. Comparison of Turkey with Other Countries**

What makes a country, a region or a country appealing to entrepreneurs? What are the major factors that attract startups to some specific region? To some extent, it is the ecosystem that stimulates entrepreneurs and/or startups to flock to a region. There is a variety of reports that compare and contrast ecosystems across regions. One of them is the Global Entrepreneurship Monitor, published by the Global Entrepreneurship Research Association of London Business School. This report mainly focuses on the advanced regions of the world. However, the 2020/2021 report does not cover Turkey.

On the other hand, a startup intelligence platform, Startups.watch, publishes annual reports for the Turkish startup ecosystem and benchmarks it with its European counterparts. In the 2020 Annual Report, countries are classified into four categories, which are super league, first league, second league and third league. The super league includes countries that surpass the threshold of USD1 billion investment volume for startups. The first league consists of countries that float between USD100 million and USD1 billion. The second league's countries attract startup investment between USD10 million and USD100 million. Lastly, countries of the third league have startup investment between USD1 million and USD10 million.

According to the 2020 Annual Report of Startups.watch, the Turkish startup ecosystem finds itself in the first league with USD139 million in funding, as seen in table 4.2. At the top of the first league, there is Belgium with USD800 million of startup funding. The UK tops the super league with USD13.6 billion, followed by France and Germany with USD5.3 billion and USD5.1 billion, respectively. As mentioned in the previous section, recent developments in Turkey paved the way to grow successful startups with huge potential. The rising number of mentorship programs, accelerators, and demo days have led to a vast number of startups.

**Table 4. 2. Europe Funding Leagues in 2020**

Super League		1 <sup>st</sup> League		2 <sup>nd</sup> League		3 <sup>rd</sup> League	
Country	Funding	Country	Funding	Country	Funding	Country	Funding
UK	13.6	Belgium	0.80	Luxembourg	0.09	Croatia	0.010
France	5.3	Spain	0.77	Portugal	0.09	Romania	0.008
Germany	5.1	Denmark	0.65	Hungary	0.08	Malta	0.008
Sweden	2.3	Italy	0.58	Iceland	0.06	Slovenia	0.008
Switzerland	1.8	Ireland	0.58	Greece	0.04	Belarus	0.004
The Netherlands	1.5	Estonia	0.31	Ukraine	0.03	Serbia	0.003
Finland	1.1	Austria	0.26	Latvia	0.03		
		Russia	0.20	Czechia	0.03		
		Norway	0.20	Lithuania	0.03		
		Poland	0.18	Bulgaria	0.01		
		Turkey	0.14				

Source: 2020 Year in Review, Startups.watch, 2021.

#### 4.1.8. Comparison of Istanbul with Other Ecosystems

In addition to the Global Entrepreneurship Research Association of London Business School, there is another research institute, Startup Genome, which publishes the annual “2021 Ranking of Top 100 Emerging Ecosystems”. These 100 Emerging ecosystems generated startups worth USD 124 billion between 2011 and 2020.

The report aims to cover ecosystems that are in earlier stages of growth. The ranking unveils the strengths in ecosystems with the highest potential to become global top performers. The report proposes a classification based on four criteria, which are performance, funding, market reach and talent and experience.

Table 4.3 shows the ranking of the first 20 out of 100 ecosystems. Istanbul, which belongs to the section of Europe, is ranked 16<sup>th</sup> with factor scores of performance (7), funding (10), market reach (9) and talent and experience (9). The reports emphasizes Istanbul’s advantage about having the largest youth population among its European counterparts. It is suggested that its young and digitally connected population makes Istanbul one of the best spots to test new ideas and products.

Estonia, an interesting example, is placed on the 6<sup>th</sup> spot. The ecosystem is supported by the policies and actions of the government. E-residency program, which facilitates entrepreneurs to create an EU company fully online, may be proposed as a best practice. Foreign entrepreneurs do not need to physically move to Estonia; however, they can set up a company online and start marketing their products to Europe<sup>27</sup>.

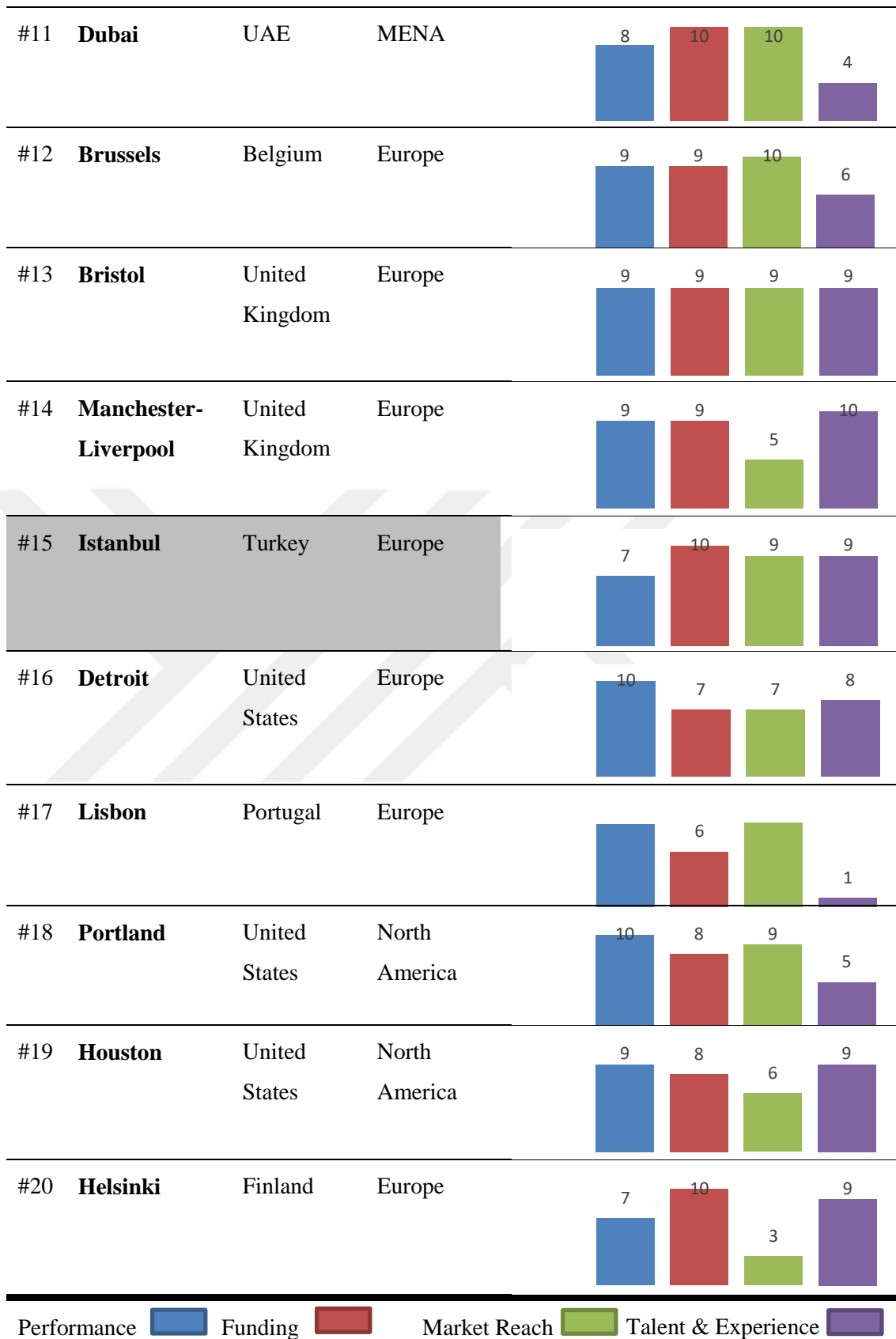
Another city from Europe, Frankfurt, has benefitted from the global pandemic in 2020 since BioNTech SE, a German company which along with its partner Pfizer, developed vaccine against Covid-19. Dubai has its own dynamics with huge tax advantages. Dubai administration offers growth opportunities for investors across future-oriented sectors, driven by long-term strategies focused on AI, blockchain, 3D printing, IoT and its role as a testbed for concepts in a live setting (Startup Genome, 2021).

---

<sup>27</sup> <https://www.e-resident.gov.ee/start-a-company/>, access on December 23, 2021.

**Table 4.3. Top 100 Emerging Ecosystem Rankings, 2021**

#	Ecosystems	Country	Continent	Factor Scores (1-10)			
#1	<b>Mumbai</b>	India	Asia	10	10	9	10
#2	<b>Copenhagen</b>	Denmark	Europe	10	10	10	8
#3	<b>Jakarta</b>	Indonesia	Asia	10	10	9	8
#4	<b>Guangzho</b>	China	Asia	10	8	6	10
#5	<b>Barcelona</b>	Spain	Europe	9	10	7	10
#6	<b>Estonia</b>	Estonia	Europe	6	9	10	1
#7	<b>Wuxi</b>	China	Asia	10	5	9	10
#8	<b>Madrid</b>	Spain	Europe				
#9	<b>Zurich</b>	Switzerland	Europe	8	10	9	7
#10	<b>Miami</b>	United States	North America	10	10	4	10



Source: Rankings 2021: Top 100 Emerging Ecosystems, The Global Startup Ecosystem Report 2021, Startup Genome.

## 4.2. Literature Review

A high proportion of entrepreneurship literature studies firms, their emergence and growth, and also their impact on national and regional economies. Furthermore, only a small proportion of the literature deals with regional aspects. However, there is no study on the differentiation of startups from traditional SMEs (including every single entrepreneurship activity) and focusing on the growth of startups with a public economic view. Governments, NGOs, and international institutions allocate grants to firms (mostly SMEs) in order to keep their dynamism alive, create more jobs and contribute to regional development. There is literature, not very sizable though, on the effectiveness of such grants on SMEs. However, there is almost no study on the effectiveness of funds, especially venture capital or angel investment, in terms of startup performance.

Moreover, most studies focus on the modeling of how to value startups, the importance of financing of startups, and the role and behavior of investors (venture capital, angel investment, private equity) in the startup ecosystem. However, there is almost no literature on the growth performance of startups before and after investments stage. In this part, our paper will therefore take startup financing literature into consideration.

Paik and Woo (2014) examines how fluctuations in the amount of capital flowing into venture funds affect the financing of innovative startup firms and how economic downturns affect such financing. It is argued that the nature of the economic downturn can cause differential effects on the investment pattern. In conclusion, it has been found find that investors invest more in early stage startups than in later-stage startups when the amount of capital flowing into the market increases. This study may be classified in the funding perspective, but does not include startup performance.

Bottazi et. al. (2002) examines the European venture capital funds and their effects on the VC-backed firms. The paper provides an initial assessment of the role of venture capital in Europe, and of its ability to contribute to economic growth and job creation. It is found that venture-backed firms do not generate more sales or create more new jobs than others. When the sample is restricted to the more innovative firms, those that perform R&D, the venture-backed ones appear to increase their sales less than the others. On the contrary, regarding the 5-year stock market performances, venture capital backed firms outperform similar non-venture capital backed firms. However,

this study ignores the performance of firms before investment stage. It aims just to compare the stock performances of invested versus non-invested firms. In addition to this, there is no condition of parallel trends before the investment stage. The study roughly compares all statistically available firms with no restriction. The role of government is omitted.

Manigart and Struyf (1997) conduct an explorative study on the financing of 18 high technology Belgian startups. On a counts basis, the most important sources of financing at the startup stage are the entrepreneurs and the banks, but the sources that provide the largest amounts of funds are the venture capital companies and private investors. Private investors and venture capitalists have a complementary role, with the former investing mostly at the startup and the latter financing the early growth. It has been found that the role of the government, universities and other companies is limited. It is suggested that government may play an important role in the financing of high technology startups through subsidies of all kinds and through the financing of R&D. This study, even though it takes investors and tech startups into consideration, emphasize only the increase of funds regardless of its origin (government, private sector, academia and so on).

Hellmann and Puri (2002) has the hypothesis that venture capital funds play a role beyond the traditional roles of financial intermediaries. Using a hand-collected data set on Silicon Valley startups, the paper provides evidence for the role of venture capital in the professionalization of startup companies. Hellman and Puri's perspective is from the human resources point and adopting corporate values. Obtaining venture capital is thought to be related to a variety of organizational milestones, such as the formulation of human resource policies, the adoption of stock option plans, or the hiring of marketing and sales professionals. The effect of obtaining fund is also particularly pronounced in the early stages of a company's development. This paper therefore generates a perspective of injecting corporate values into startups via venture funds.

Dessi (2005) examines optimal financial contracts between entrepreneurs, financial intermediaries (venture capitalists), and other investors that allocate both cash flow rights and control rights. There are three goals in this process. The goals are to (i) motivate the investor to efficiently monitor the entrepreneur, (ii) ensure that the efficient decision is made at the interim stage, and (iii) deter collusion between the

entrepreneur and the venture capitalist at the expense of the other investors. In this scope, the nature of contracts between startups and investors are being explored.

In 2020, the world economy started suffering from Covid-19 pandemic. According to Dasewicz et al. (2020) small businesses constitute more than 90 percent of the global private sector, providing 70 percent of all the jobs, and drive half the global economy. With the sector already facing a significant financing gap even before the outbreak of the Covid-19 virus, the pandemic has only made the financial vulnerabilities an existential threat for many firms. The most challenged ones during pandemic are no doubt the small and medium sized enterprises. Dasewicz et al. (2020) lays out the five stages of innovation (startup, early mid-growth, mid-late growth, scale, expansion); then, argue that administrations can consider short-term and medium-term tools to help mobilize private capital, revive the global economy, address the risks to small business financing, and ensure an inclusive domestic economic recovery. In this paper, the vital role of government in the allocation of funds to startups is suggested to be a prominent policy during such strange times.

Butler et al. (2016) investigate whether or not the government can improve entrepreneurial activity. In this respect, a policy aimed at promoting innovative startups through the provision of funding and technical assistance to potential entrepreneurs in Buenos Aires, Argentina is being analyzed. A survey is conducted and regression discontinuity methods are used to identify the effects of the policy. Beneficiaries and non-beneficiaries were compared and contrasted. Significant effects on enterprise creation and survival as well as on employment were found. Overall, the paper shows that small-scale public policy can help entrepreneurs overcome a wide variety of barriers to firm entry and improve the allocation of their entrepreneurial talent. However, this funding scheme was used as grants allocated to firms rather than having been used as an investment fund from the government side.

Motohashi (2012) conducts quantitative analyses using firm-level data for biotech startups both in Japan and the US. The paper touches upon the differences in funding behavior for biotech companies in Japan and the US. It is suggested that Japanese venture capital funds are less likely to invest in early-stage startups, while US venture capitalists are involved in 'screening' and 'monitoring' activities of venture businesses. Therefore, the US firms are found to be positively diverging from Japanese firms in terms of growth performance.

Bates and Bradford (2008) analyze the performance of mature investments made by venture capital funds that specialize in financing minority business enterprises. Their study explores the hypothesis that such funds focusing on investing in minority businesses earn attractive returns because this market niche is underserved. This study is mostly concentrated on venture capital funds and minority-owned firms in the US. It has been found that the yields vary greatly from fund to fund. Again, this study does not compare the before and after investment performances of startups. It focuses on the gains of venture capital funds.

Another key point about startups is the valuation. It is important to distinguish the underlying determinants that affect the valuation of startups. Köhn (2017) conducts a systematic review of the existing empirical literature to illustrate the determinants of startup valuations in the investment context. The paper illustrates how startup valuations during investment stage are shaped by a three-sided interplay of factors related to startups, venture capitalists, and the external environment.

In conclusion, there is sizable literature on startups and their performance. Most studies concentrate on the positive outcomes of contributing to the startups ecosystem and facilitating access to finance. Some similar studies focus on stock prices. First, a company cannot be called a startup when it is valued in the stock market. Second, these studies evaluate startups only at the sectoral level, such as comparing stock prices of startups in sector A versus sector B.

However, there is limited study on the performance of startups after the funding stages. For Turkey, there is no similar study, conducting surveys through startups; then, comparing results of funded ones to not-funded ones, from a governmental perspective. In the next section, this study continues with the theoretical framework.

### **4.3. Theoretical Framework**

In order to recall the difference between startups and traditional small businesses, a small business isn't in search of a business model that works down the line. They're looking for a business model that works from day one. Furthermore, a small business is a self-sustaining organization that generates revenue from the first day of opening. They don't require major investments and time to formulate a company that works (Hecht, 2017). A startup has a business model and runs research and development for

the goal of obtaining an innovative good or service. Therefore, their products are differentiated and hard to be challenged at the free market.

### 4.3.1. Monopolistic Competition

Differentiated goods in the free market lead us to monopolistic competition. Table 4.4 below shows the market structure characteristics. A firm competing in a monopolistically competitive market sells a differentiated product. The market has the characteristic of free entry and exit. Therefore, unlike a firm in a perfectly competitive market, it faces a downward-sloping demand curve. When a monopolistically competitive firm cuts the price of its product, it sells more units but must accept a lower price on the units it could have sold at a higher price. As a result, its marginal revenue curve is downward sloping. Every firm that has the ability to affect the price of the good or service it sells will have a marginal revenue curve that is below its demand curve (Hubbard et al., 2015).

**Table 4. 4. Market Structure Characteristics**

<b>Perfect Competition</b>	<b>Monopolistic Competition</b>	<b>Oligopoly</b>	<b>Monopoly</b>
Homogeneous good	Differentiated good	Differentiated good	One good
Numerous firms	Many firms	Few firms	One firm
Free entry and exit	Free entry and exit	Barriers to entry	No entry

**Source:** Barkley, 2019.

As seen on the table above, there are a large number of sellers; however, no firm has the ability to influence the market. In monopolistic competition, a firm's goal is to have product differentiation, which means that its product is slightly different from the products of competing firms. Products may work for the same motivation; but,

research and development adds value and differentiation to the product. Last, there are free entry to the market and free exit from the market.

Each firm in a monopolistically competitive market is, in many ways, like a monopoly. Since its product is different from those offered by other firms, it faces a downward-sloping demand curve. (By contrast, a perfectly competitive firm faces a horizontal demand curve at the market price.) Thus, the monopolistically competitive firm follows a monopolist's rule for profit maximization: It chooses to produce the quantity at which marginal revenue equals marginal cost and then uses its demand curve to find the price at which it can sell that quantity. Moreover, the negative slope of a firm's demand function in imperfect competition results in a different result than in pure competition (Mankiw, 2018).

Startups, which have business models and run research and development for the goal of obtaining innovative goods or services, can be addressed as solid examples for monopolistic competition. After describing how startups are linked with the monopolistic competition, next section will be giving an overview of the startup theories.

#### **4.3.2. Startup Theories: Entrepreneurial Theory**

Van de Ven et al. (1984) categorize startup theories in three groups: (i) Entrepreneurial, (ii) Organizational, and (iii) Ecological. The entrepreneurial approach concentrates on the characteristics of the founder and promoter of a new organization. The entrepreneur becomes the prevailing subject on organizational creation, and specifically on innovation.

Before proceeding to the entrepreneurial approach, this part will provide a general overview of the other two approaches. The organizational approach argues that the conditions under which an organization is planned and the processes followed in its initial development have important consequences on its structure and performance in later life. The organizational approach takes the overall network of people involved in the creation of an organization as its unit of analysis and examines the series of events, planning processes, and structural forms that emerge to mobilize collective action.

The ecological approach takes the demographic conditions where the startup operates and examines the structural, political, and economic conditions which lead to the

creation of new forms of organizations. The ecological approach is linked with the population perspective, where the driving force is the skilled people.

Returning to the entrepreneurial approach; typically, entrepreneurship is identified with a dominant individual's characteristics. The characteristics generally describe an independent-minded, self-made manager with a business idea or device, a strong commitment to make it marketable, and the resources and capital to start a business (Collins and Moore, 1970). The success of a startup business is directly linked to the skills and experience of the entrepreneur. Such skills and expertise lead to differentiation and specialization.

An entrepreneur is said to have a sound and unique business idea, motivation and commitment in order to kick off a startup, which is completely different than a traditional business (Pinchot, 1983). The breadth, clarity, and source of the initial business idea, as described by the entrepreneurs, were all significantly related to startup success and company development.

According to Entrepreneurial Approach focusing on startups, suggested by Van de Ven et al. (1984), the following entrepreneurial characteristics are found to be significantly associated with startup success and development: (i) education and experience, (ii) internal locus of control and number of ways to reduce risk, (iii) a broad and clear business idea, and (iv) personal investment in the new firm.

Linking with our study, this theory is consistent with the idea that startups apply innovative business ideas and produce differentiated products through specialization. Therefore, funds are more eager to invest in such startups, which have potential to grow rapidly. In this respect, this study proposes that governments should be involved in this ecosystem as a key player that funds innovative startups. Next section is presenting the data, methodology and empirical results drawn from the analysis.

#### **4.4. Data, Methodology and Empirical Results**

After laying out the theoretical background and selecting monopolistic competition and entrepreneurial startup theory as its base, this study continues with the empirical analysis with a consideration of the data collected through a survey of 60 ICT startups. The discussion is anticipated to conclude with the actual estimating equations and a presentation of other findings from regression analysis.

#### 4.4.1. Research Hypothesis

In this research, hypotheses are laid to test whether or not funded ICT startups have higher income, profit and employment generation when compared to the not funded ones. The objective of this study is to measure the impact of such funding mechanism through field study and survey of 60 startups (Control: 40, Treatment: 20). In support of the research objective, the following specific hypotheses are investigated:

*Null Hypothesis ( $H_0$ ):* Angel investment or venture capital funds allocated to ICT startups have no significant effect on employment, profit and income.

*Alternative Hypothesis ( $H_A$ ):* Angel investment or venture capital funds allocated to ICT startups have significant effect on employment, profit and income.

#### 4.4.2. Data

As mentioned in the previous sections, there are 3,311 active startups in Istanbul, as of 2019. In this study, survey questions were prepared and sent to 100 startups, whose information was obtained through Startups.watch database. These 100 startups have been selected through the criteria shown in table 4.5.

81 startups have successfully filled out the survey forms. Survey questions involved the income, profit, and employment figures covering years from 2015 to 2019, with the base year of 2017.

Only 60 of them, which operate as an ICT firm under Nace Rev. 2 classification, have been selected. There are two reasons why these 60 ICT startups have been selected whereas the remaining startups operating in different sectors were omitted.

The first reason is that almost all of the startups operate in the ICT sector. Software as a Service, Fintech, Artificial Intelligence, Marketing Tech, Healthtech, and Deeptech, which are the subcategories of ICT, are classified as the top five ones according to both deal size and deal numbers in 2020 (Startups.watch, 2021). The second reason is that, after adding all the startups in our survey, it was observed that the outcome violated the condition of parallel trends in counterfactual impact evaluation (difference in differences estimation).

The treatment group is described as startup firms that receive investment (fund) from an angel investment network or a venture capital fund in 2017. The filtering criteria of

startups are listed in table 4.5. After the filtering process, the selected treatment group included 20 startups and the control group included 40 firms.

**Table 4. 5. Data (Startup) Filtering Criteria**

Time Frame	2015 - 2019
Name of Sector (Nace Code)	ICT (Nace Rev.II: 61, 62, and 63)
Firm Activity Period	Must be actively operating from 2015 to 2019
Control Group	Never received investment (fund) from 2015 to 2019
Treatment Group	Received investment (fund) in 2017, but not received in other years.
Income	$M > 0$ each year from 2015 to 2019
Profit	$\Pi > 0$ each year from 2015 to 2019
Labor Force	Recruit min 1 employee

This study focuses on startups in ICT sector based on Nace Rev. 2 classification between 61 and 63. The analysis is run through a dependent variable and 3 independent variables. There are 3 different dependent variables; therefore, each individual dependent variable is regressed on these 3 independent variables, which are dummies capturing invested (funded) startups, year 2019 and the interaction terms of these two. The descriptions of the selected variables are shown in table 4.6.

**Table 4. 6. Description of Variables**

---

Dependent Variables	loglabor	Natural logarithm of labor force
	logincome	Natural logarithm of income in a year
	logprofit	Natural logarithm of profit (after tax) in a year

---

Independent Variables	funded	Dummy for invested (funded) startups at year 2015
	y_t+1	Dummy for year 2019
	y_t+1_funded	Dummy for interaction term of invested (funded) startups and year 2019

---

#### **4.4.3. Descriptive Statistics**

Out of the responded 81 startups, only 60 of these startups (only ICT sector) have been considered due to the violation of parallel trends assumption of difference in differences method.

In conclusion, 60 startups have been selected through the criteria shown in table 4.5. Besides differentiating startups as treatment and control, according to their status of being funded or not funded at year 2017, it is important to provide additional information about their nature. Out of these 60 startups, 22 of them are operating in a science park (technological development zone) or an incubator. This study selects 2017 as its base year, when the treatment group receives fund. In this regard, the summary of main covariates in the final dataset is shown in table 4.7. 2015 and 2019 are the two periods when the treatment and control groups will be compared.

**Table 4. 7. Summary of the Main Covariates in the Final Dataset**

Time	Year	Covariates	Observations	Mean		
				Control	Treatment	Total
(t-1)	2015	loglabor	120	2.17746	1.32536	1.89343
		logincome	120	13.72413	11.66680	13.03836
		logprofit	120	11.66765	9.55904	10.96478
(t+1)	2019	loglabor	120	2.59184	2.63154	2.60508
		logincome	120	14.92325	14.20749	14.68467
		logprofit	120	13.11413	12.78631	13.00486

Speaking about the control group; our survey data shows that the average of the labor force between 2015 and 2019 was 13.6 and ranged from a low of 11.525 in 2015 to a high of 15.7 in 2019. Income, on the other hand, varies from a low of TRY1.5 million in 2015 to a maximum of TRY4.8 million in 2019. Regarding profit, the lowest average again comes from 2015 with TRY0.24 million and the highest average was in 2019 with TRY0.94 million.

Speaking about the treatment group, the survey data shows us that the average of the labor force between 2015 and 2019 was 10.1 and ranged from a low of 4.55 in 2015 to a high of 15.7 in 2019. Income, on the other hand, varies from a low of TRY0.37 million in 2015 to a maximum of TRY2.9 million in 2019. Regarding profit, the lowest average again comes from 2015 with TRY0.07 million and the highest average was in 2019 with TRY0.72 million.

#### 4.4.4. Methodology

##### 4.4.4.1. Counterfactual Impact Evaluation: Average Treatment Effect

The OECD defines impact evaluation as “*Impact evaluation is an assessment of how the intervention being evaluated affects outcomes, whether these effects are intended or unintended. The proper analysis of impact requires a counterfactual of what those outcomes would have been in the absence of the intervention*”. The most common counterfactual is to use a comparison group. The difference in outcomes between the beneficiaries of the intervention (the treatment group) and the comparison group is a single difference measure of impact. This measure can suffer from various problems, so that a double difference, comparing the difference in the change in the outcome for treatment and comparison groups, is to be preferred<sup>28</sup>.

Impact evaluation is the general framework for both evaluating data over time in terms of goals, indicators and outcomes and seeking tools that may enhance the quality of the program (Luque-Fernandez, 2014). In this study, counterfactual impact analysis, classically known as Neyman-Rubin Counterfactual Framework, will be followed to estimate the impact of funding on the performance of startups. In other words, the goal is to answer the question: what would have happened if the funding from angel investors and/or venture capital funds had not existed.

Neyman-Rubin Framework is becoming increasingly popular in recent years due to the fact that the framework is easy to apply as long as its preconditions are met. In this framework, there are two potential outcomes. The difference between two potential outcomes is defined as a causal effect, although only one of the two potential outcomes is observed. (Sekhon, 2007).

Let  $Y_{i1}$  denote the potential outcome for unit  $i$  if the unit receives treatment, and let  $Y_{i0}$  denote the potential outcome for unit  $i$  in the control group. Then the treatment effect of observation  $i$  is:

$$\tau_i = Y_{i1} - Y_{i0} \quad (4.1)$$

Let  $T_i$  be a treatment indicator: labeled as 1 when  $i$  is in the treatment regime and 0 otherwise.

---

<sup>28</sup> Outline of Principles of Impact Evaluation, OECD, <https://www.oecd.org/dac/evaluation/dcdndep/37671602.pdf> (access on May 03, 2021)

The observed outcome for observation  $i$  is as follows:

$$Y_i = T_i Y_{i1} + (1 - T_i) Y_{i0} \quad (4.2)$$

From an expectation point of view, the distributions of both observed and unobserved variables in both groups are equal. Treatment assignment is independent of  $Y_0$  and  $Y_1$ , for instance  $\{Y_{i0}, Y_{i1} \perp T_i\}$ , where  $\perp$  denotes independence (Dawid, 1979). Hence, for  $j = 0, 1$

$$E(Y_{ij} | T_i = 1) = E(Y_{ij} | T_i = 0) = E(Y_i | T_i = j) \quad (4.3)$$

Then the average treatment effect is estimated by:

$$\tau = E(Y_{i1} | T_i = 1) - E(Y_{i0} | T_i = 0) \quad (4.4)$$

$$\tau = E(Y_i | T_i = 1) - E(Y_i | T_i = 0) \quad (4.5)$$

Equation (5.5) then defines the intention-to-treat (ITT) estimand. The outcomes for the treated and control individuals are:

$$Y_i(1) = Y_i(T = 1) \quad \text{for some treatment variable } T \text{ (Treated)} \quad (4.6)$$

$$Y_i(0) = Y_i(T = 0) \quad \text{for some treatment variable } T \text{ (Control)} \quad (4.7)$$

The Potential Outcomes for an individual  $i$  if he/she received treatment or control are:

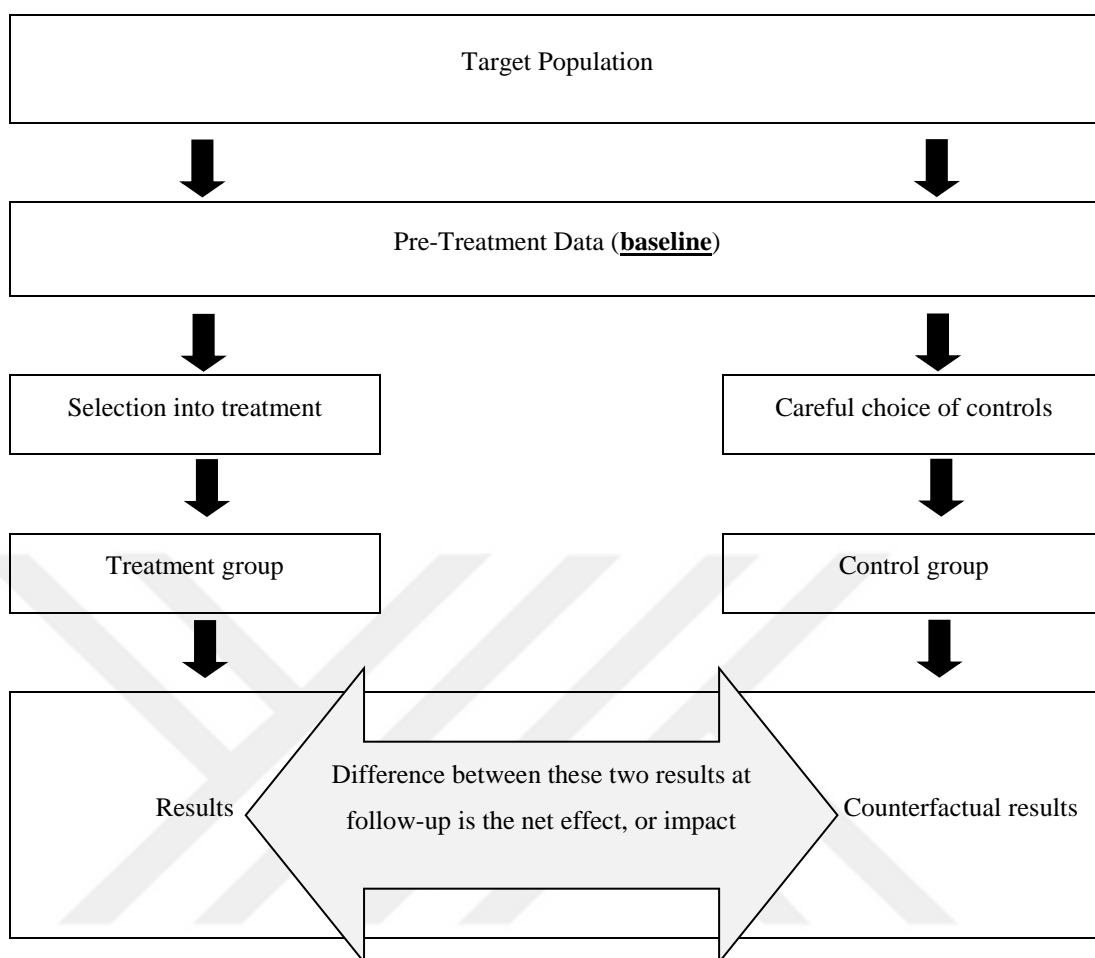
$$Y_i(1) = Y_i(T = 0) \quad \text{is the counterfactual or potential outcome for } Y_i(1) = Y_i(T = 1) \text{ (Treated)} \quad (4.8)$$

$$Y_i(0) = Y_i(T = 1) \quad \text{is the counterfactual or potential outcome for } Y_i(0) = Y_i(T = 0) \text{ (Control)} \quad (4.9)$$

However, we only observe:

$$Y_i(1) = Y_i(T = 1) \text{ and } Y_i(0) = Y_i(T = 0) \quad (4.10)$$

Figure 4.6 below exhibits the stylized quasi-experimental design with treatment and control groups.



**Figure 4. 6. Stylized Quasi-Experimental Design with Treatment**

**Source:** Directorate-General for Employment, Social Affairs and Inclusion, European Commission, 2012.

#### 4.4.4.2. Difference-in-Differences

In this study, the difference in differences estimation will be used. The motivations to use this estimation are that the regression will have free estimates of standard errors, reduced bias from potential differences in time trends, and increased precision of estimate.

Trend in control group approximates what would have happened in the treatment group in the absence of treatment or intervention. In the following tables and expressions “C” represents the control group which did not get treatment, “Tr” represents the treatment group, “Pre” represents the calculations before treatment, and “Post” represents calculations after treatment.

$$\text{Difference in Differences} = (\bar{y}_{Tr,Post} - \bar{y}_{Tr,Pre}) - (\bar{y}_{c,Post} - \bar{y}_{c,Pre}) \quad (4.11)$$

**Table 4. 8. Means of Control and Treatment Groups**

	Pre	Post
Control	$\bar{y}_{c,Pre}$	$\bar{y}_{c,Post}$
Treatment	$\bar{y}_{Tr,Pre}$	$\bar{y}_{Tr,Post}$

$$y = \beta_0 + \beta_1 D^{post} + \beta_2 D^{TR} + \beta_3 (D^{post} * D^{TR}) + \beta_4 X + e \quad (4.12)$$

where  $D^{post}$  is a dummy variable for post or previous measurement,  $D^{TR}$  is a dummy variable for treatment or control groups, and  $(D^{post} * D^{TR})$  is an interaction term.

**Table 4. 9. A Visual Exhibition of Difference in Differences Estimation**

Y	$D^{post}$ (Pre=0)	$D^{post}$ (Post=1)	Difference
$D^{TR}$ (control=0)	$\beta_0$	$\beta_0 + \beta_1$	$\beta_1$
$D^{TR}$ (Treatment=1)	$\beta_0 + \beta_2$	$\beta_0 + \beta_1 + \beta_2 + \beta_3$	$\beta_1 + \beta_3$

While estimating any causal effect, there are three assumptions necessary to hold: exchangeability, positivity, and Stable Unit Treatment Value Assumption (SUTVA).

The difference in difference estimation also requires the following criteria:

- Intervention unrelated to outcome at baseline (allocation of intervention was not determined by outcome)
- Treatment/intervention and control groups have Parallel Trends in outcome (see below for details)

- Composition of intervention and comparison groups is stable for repeated cross-sectional design (part of SUTVA)
- No spillover effects (part of SUTVA)

The parallel trend assumption is seen as a vital assumption of all. It ensures the internal validity of difference-in-difference models and is the most difficult to achieve. It requires that the difference between the 'treatment' and 'control' groups be constant over time in the absence of treatment. Although there is no statistical test for this assumption, visual inspection can be beneficial when there are observations at multiple time points. It has also been suggested that the shorter the time period tested, the more likely the assumption is to be correct. Here, this study compares and contrasts these two groups for the years 2015 and 2019. The intervention is assumed to be done in 2017. Violation of parallel trend assumption will lead to biased estimation of the causal effect<sup>29</sup>.

#### 4.4.5. Estimating Equations and Empirical Results

Revising the equation (5.11) according to the descriptions of this paper:

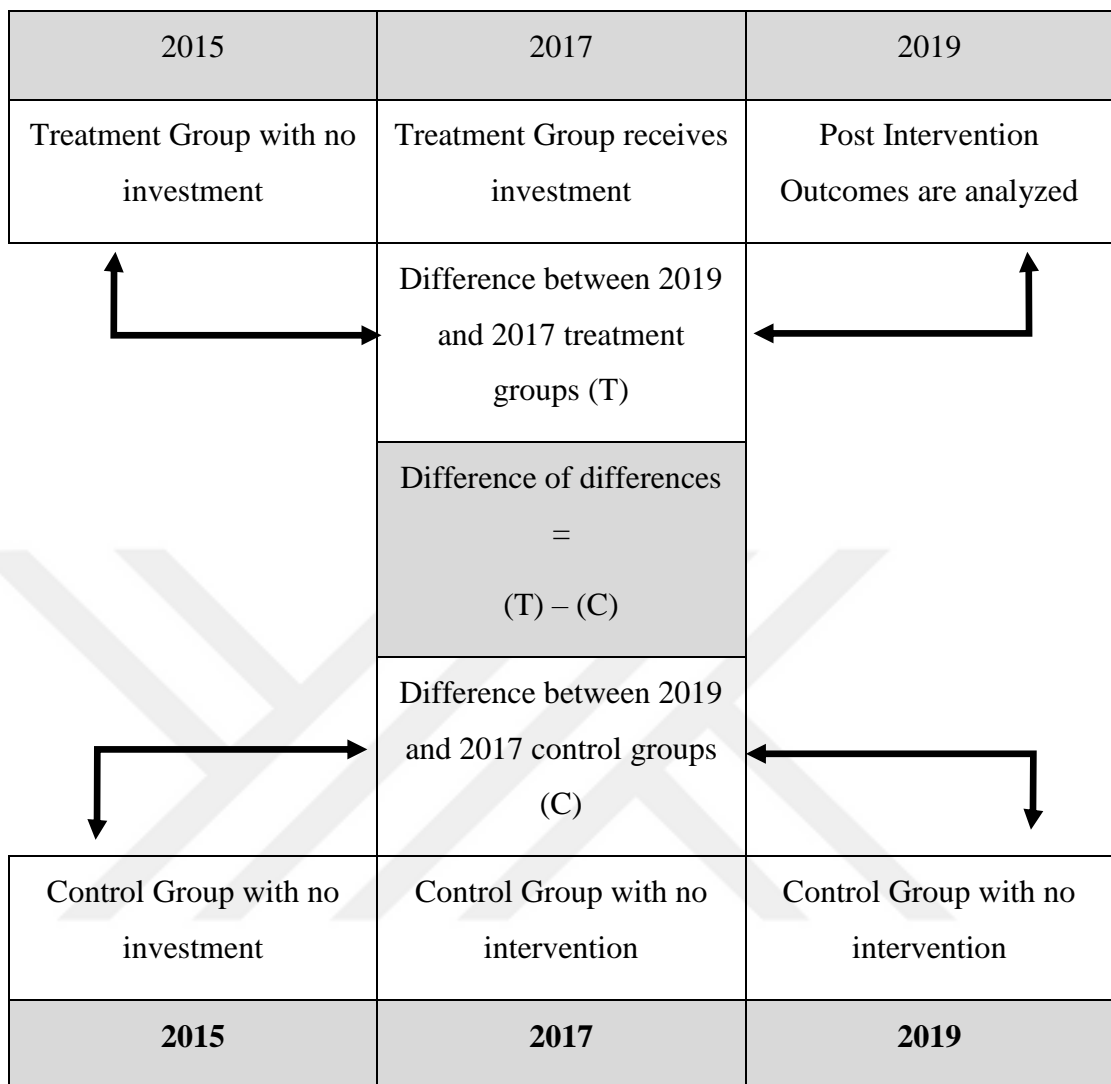
$$y = \beta_0 + \beta_1 y_{t+1} + \beta_2 \text{funded} + \beta_3 (y_{t+1} * \text{funded}) + e \quad (4.13)$$

where  $y_{t+1}$  is a dummy variable for post or previous measurement, *funded* is a dummy variable for treatment or control groups,  $(y_{t+1} * \text{funded})$  is an interaction term, and  $e$  is the white noise error term. To be clear, the coefficient on  $(y_{t+1} * \text{funded})$  is the value we are interested in ( $\beta_3$ ).

In summary, this paper aims to find the difference between treatment group and control group, how they diverged from each other, before and after receiving investment. Figure 4.7 exhibits the time frame of treatment group versus control group.

---

<sup>29</sup> Mailman School of Public Health, Columbia University  
<https://www.mailman.columbia.edu/research/population-health-methods/difference-difference-estimation> access on July 14th, 2019)



**Figure 4. 7. Time Frame of Treatment Group vs Control Group**

#### **4.4.6. Regression Outcomes**

The regression outcomes are shown in the table below. As stated in previous sections, “constant” represents the average of non-funded ICT startups in 2015 and “y<sub>t+1</sub>” represents the dummy for year 2019. Regarding the treated group, “funded” is the dummy variable for invested (funded) ICT startups at year 2015 and “y<sub>t+1\_funded</sub>” represents their post intervention values.

Table 4.10 involves three dependent variables; loglabor, logincome and logprofit, which correspond to the natural logarithms of labor, income and profit, respectively.

**Table 4. 10. Regression Results**

	(1)	(2)	(3)
	<b>loglabor</b>	<b>logincome</b>	<b>logprofit</b>
	<b>b/t</b>	<b>b/t</b>	<b>b/t</b>
<b>y_t+1</b>	0.414**	1.199***	1.446***
	(0.14)	(0.25)	(0.33)
<b>funded</b>	-0.852***	-2.057***	-2.109***
	(0.18)	(0.31)	(0.40)
<b>y_t+1_funded</b>	0.892***	1.342**	1.781**
	(0.25)	(0.44)	(0.57)
<b>_cons</b>	2.177***	13.724***	11.668***
	(0.10)	(0.18)	(0.23)
<b>N</b>	60	60	60
<b>R<sup>2</sup></b>	0.344	0.492	0.427

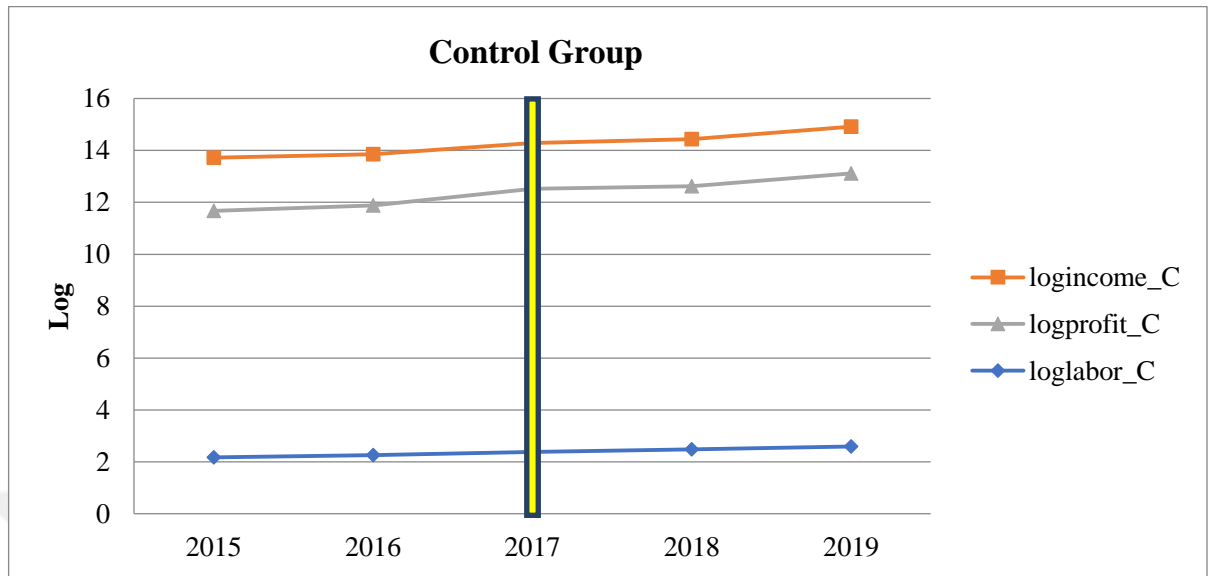
b: coefficient t: t-stat

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

As predicted before, startups are moving forward and gaining more labor, income and profit at the end of each year, regardless of intervention. However, funded startups exhibit a positively diverging pattern when compared to the control group after intervention. The treatment group has steeper slopes in each regression when compared to the control group.

Figure 4.8 demonstrates the change of control group between pre-intervention and post-intervention. Logarithms of income, profit and labor start at 13.72, 11.67 and 2.18, respectively. Until the intervention period, the trend of control group runs parallel to the treatment group in all three regressions. After intervention period, control group still has a positive slope in terms of labor, income and profit. Control group, which

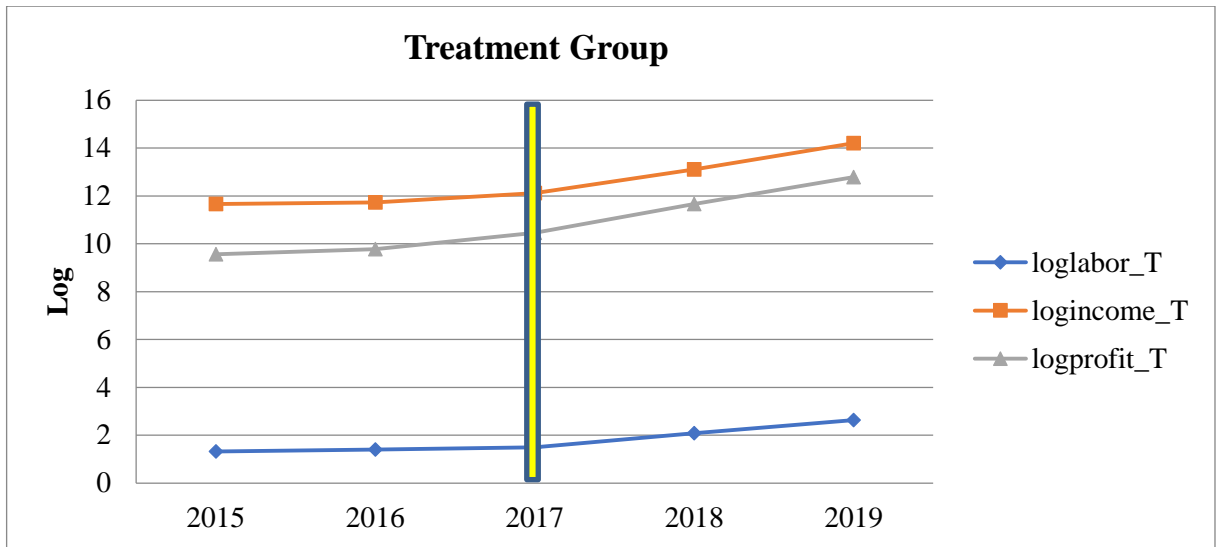
consists of 40 ICT startups, end up with the results of income, profit and labor as 14.92, 13.11 and 2.59, respectively.



**Figure 4. 8. Control Group between 2015 and 2019**

\*Colored (yellow) bar is placed at the intervention year.

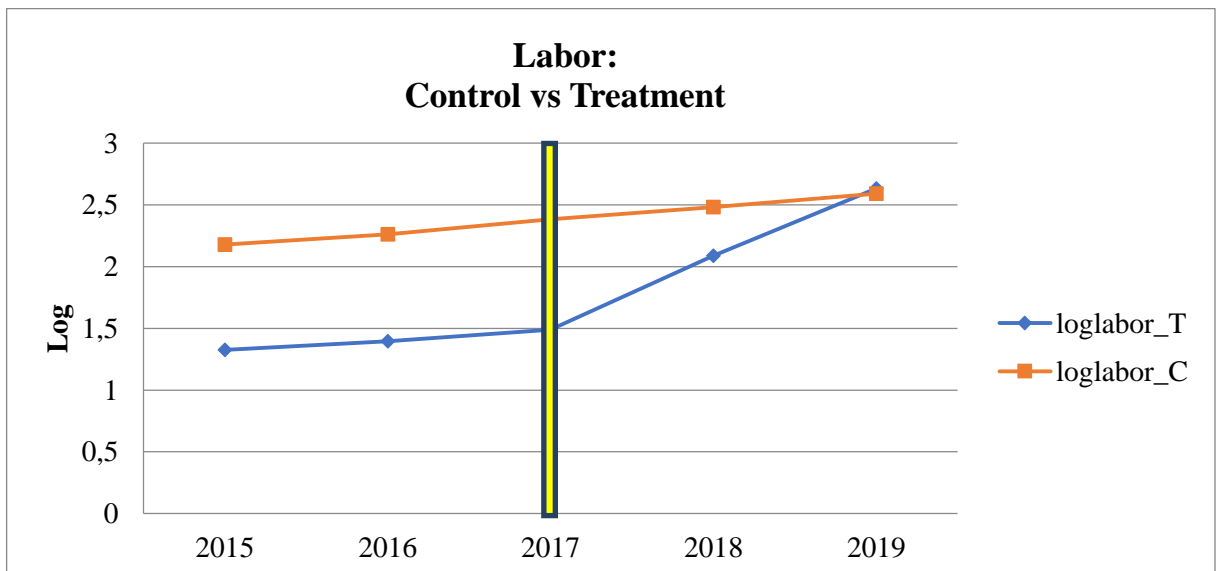
Figure 4.9 pinpoints the change in treatment group between pre-intervention and post-intervention. Logarithms of income, profit and labor start at 11.67, 9.56 and 1.33, respectively. Until the intervention period, the trend of the treatment group runs parallel to the control group in all three regressions. After the intervention period, the treatment group demonstrates a steeper positive slope in terms of labor, income and profit. The treatment group, which consists of 20 ICT startups funded during the intervention period, end up with the results of income, profit and labor as 14.21, 12.79 and 2.63, respectively. Regarding employment, the treatment group not only catches up with the control group, but also surpasses it.



**Figure 4. 9. Treatment Group between 2015 and 2019**

\*Colored (yellow) bar is placed at the intervention year.

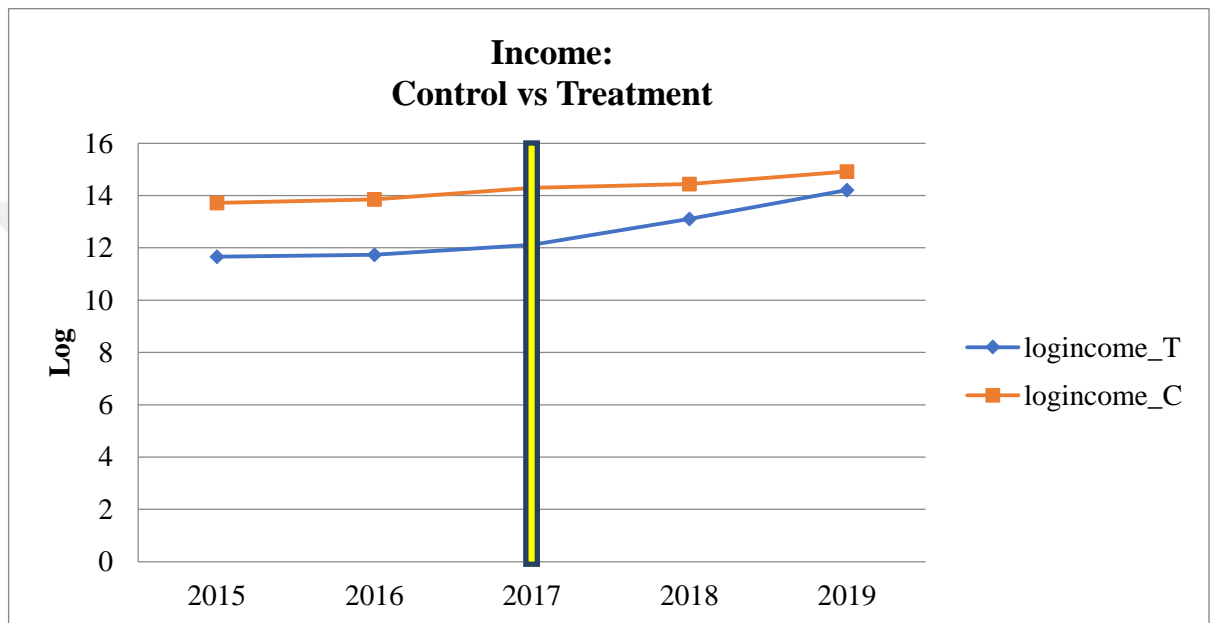
Figures 4.10, 4.11 and 4.12 illustrate the changing pattern of both groups after intervention period. Figure 4.10 compares control group and treatment group in terms of the natural logarithm of labor. After running parallel until the intervention period, it can be seen that there is a clear divergence. It is observed that funded startups are positively diverging from the control group. Moreover, treated startups comes from behind and surpass the control group in 2 years after intervention, in 2019.



**Figure 4. 10. Control Group vs. Treatment Group: Labor**

\*Colored (yellow) bar is placed at the intervention year.

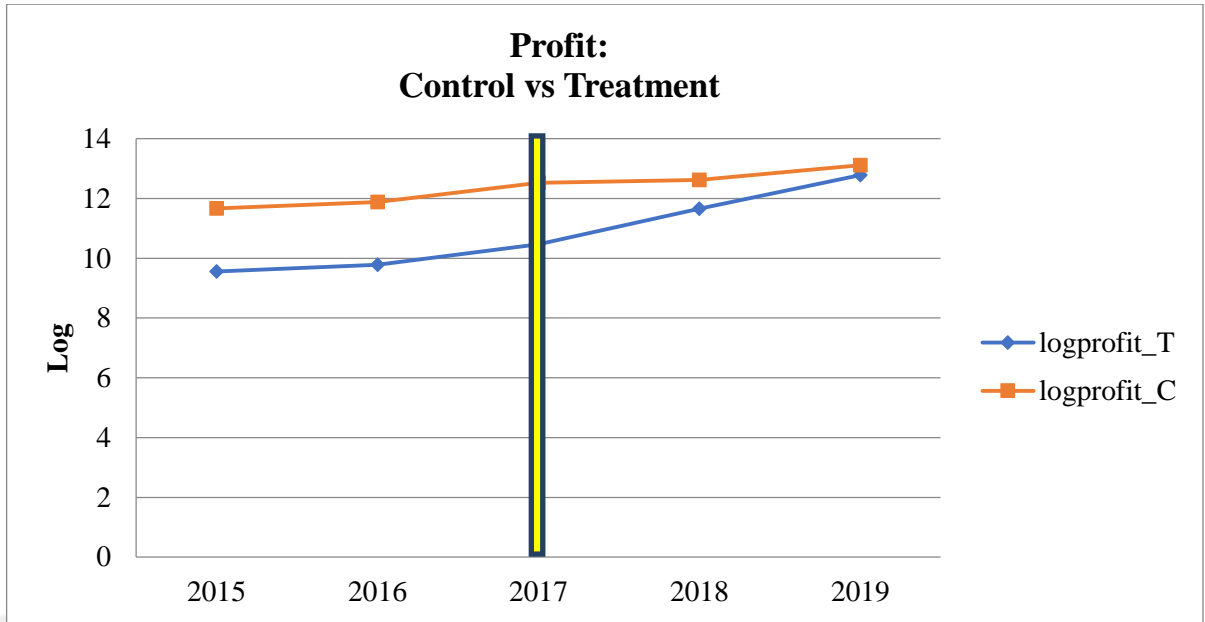
Figure 4.11 compares the regression results of both groups in terms of the natural logarithms of their income levels. Likewise, the data shows that funded startups have a steeper slope of income when compared to the control group. It is again observed that there is a parallel trend before intervention. After intervention, average income of control group continues to follow approximately its previous slope; however, treatment group's slope rises visually.



**Figure 4. 11. Control Group vs. Treatment Group: Income**

\*Colored (yellow) bar is placed at the intervention year.

In Figure 4.12, data from survey shows a similar outcome for the natural logarithm of profit. Even though there is a parallel trend between control group and treatment group before the intervention time, treated sample's slope gets steeper than that of control group.



**Figure 4. 12. Control Group vs. Treatment Group: Profit**

\*Colored (yellow) bar is placed at the intervention year.

As anticipated, survey data proved that the percentage change in labor employment, income level and profit level of funded startups have surpassed those of ICT startups which were not funded by investment funds. Results of all three regressions are significant.

On the other hand, our results need to be interpreted with caution. Given that our findings are based on a limited number of startups, the results from such analyses should thus be treated with the utmost caution. Additionally, our survey does not cover startups from various sectors or backgrounds. It covers only a sample of startups from ICT sector operating in Istanbul, Turkey.

#### **4.5. Conclusion**

Startups, which undoubtedly differ from traditional enterprises due to their innovative and technological foundations, are usually named SMEs with the potential to grow rapidly. This study intends to question the effectiveness of SMEs from a different perspective. Rather than focusing on traditional SMEs, startups and their performance have been analyzed.

In this study, ICT startups operating in Istanbul have been interviewed and asked to fill out a survey questionnaire. It has been investigated that angel investment or venture capital funds allocated to ICT startups have or do not have a significant effect on employment, profit, and income. Above all, the evidence from this study highlighted the importance of allocating grants to startups, rather than to traditional businesses. In any case, ICT startups exhibit an upward slope regardless of the funding condition. Accurate results have been obtained from survey data. Difference in differences methodology has been employed while processing the data.

The findings of this study showed that the startups, which received investment, exhibited better performance than the startups which opted not to receive fund. The percentage change in income, profit and labor employment of ICT startups that were funded during the intervention period was way higher than the percentage change of the control group.

The strength of this study lies in the fact that there is no similar study in the Turkish startup ecosystem. Additionally, these findings add to a limited but growing body of literature on the importance of startups and the effective allocation of government funds.

This study clearly has some limitations. Even though the preliminary number of startups was 80, the scope has been lowered to 60 and the sample consisted of only ICT startups due to the “parallel trends” prerequisite of counterfactual evaluation (difference in differences estimation). Therefore, given the small sample size, caution must be exercised while interpreting results. A further study may be conducted with an extended survey and a higher number of startups covering various sectors across Turkey.

As mentioned before, startups produce innovative products. Such products generate higher income, profit, and labor employment when compared to the products of

traditional businesses. This study may implicitly suggest that governments might be allocating grants to businesses producing higher value-added goods and services. Promising results may be expected since more labor employment and rising income of households are some of the prominent goals of a government.

This research demonstrates that ICT startups display a positive and steeper slope when they receive investment from funding companies. In brief, our findings have raised many questions in need of further investigation of the concept of “startup funding” from a governmental perspective. It is recommended that further research should be undertaken in various sectors with a broader dataset.



## References

- Barkley, A. (2019), "The Economics of Food and Agricultural Markets", *New Prairie Press*, Ch. 5.
- Bates, T. and Bradford, W. D. (2008), "Venture-Capital Investment in Minority Business", *Journal of Money, Credit and Banking*, Mar. - Apr., Vol. 40, No. 2/3, pp. 489-504.
- Blank, S. (2010), "What's A Startup? First Principles", <https://steveblank.com/2010/01/25/whats-a-startup-first-principles/> (access on March 15, 2020)
- Bosma N., Hill, S., Ionescu-Somers, A., Kelley, D., Levie, J., and Tarnawa A. (2019), "Global Entrepreneurship Monitor 2019/2020 Global Report", *Global Entrepreneurship Research Association*, London, UK.
- Bottazzi, L., Da Rin, M., Van Ours, J. C., and Berglöf, E. (2002), "Venture Capital in Europe and the Financing of Innovative Companies", *Economic Policy*, April, Vol. 17, No. 34, pp. 229-269.
- Butler, I., Galassi, G., and Ruffo, H. (2016), "Public funding for startups in Argentina: an impact evaluation", *Small Business Economics*, Feb., Vol. 46, No. 2, pp. 295-309.
- Collins, O. and Moore, D.G. (1970), "The Organization Makers", *Appleton-Century-Crofts*, New York.
- Columbia University, "Difference-in-Difference Estimation", *Population Health Methods*, <https://www.mailman.columbia.edu/research/population-health-methods/difference-difference-estimation> (access on May 04, 2021)
- Dasewicz, A., Simon, J., and Ramanujam, S. R. (2020), "Financing Small Business Is Critical for a Strong Post-Covid Recovery", *Center for Strategic and International Studies (CSIS)*, 24 September 2020, Washington D.C.
- Dessí, R. (2005), "Start-up Finance, Monitoring, and Collusion", *The RAND Journal of Economics*, Summer, Vol. 36, No. 2, pp. 255-274.
- Digital Edenz (2018), "Why Startups are important for economic growth of a nation", <https://digitaledenz.com/why-startups-are-important-for-economic-growth-of-a-nation/> accessed on February 12, 2021.
- Durdak, A. (2019), "Bölgesel Kalkınma Fonu ile 'Teknoloji ve İnovasyon Fonu Kuruldu'", *Anadolu Ajansı*, <https://www.aa.com.tr/tr/bilim-teknoloji/bolgesel-kalkinma-fonu-ile-teknoloji-ve-inovasyon-fonu-kuruldu/1682748> (access on March 10, 2021).
- European Commission (2012), "Design and Commissioning of Counterfactual Impact Evaluations", *Directorate-General for Employment, Social Affairs and Inclusion*, Unit A3.
- Global Entrepreneurship Monitor, "Data", <https://www.gemconsortium.org/data> (access on February 12, 2021).
- Harris, K. (2016), "The difference between startups and SMEs", *BrighterBlog*, <https://brighterbox.com/blog/article/difference-between-startups-and-smes> accessed on April 12, 2022.

- Hecht, J. (2017), “Are You Running A Startup Or Small Business? What's The Difference?”, *Forbes*, Dec. 8, <https://www.forbes.com/sites/jaredhecht/2017/12/08/are-you-running-a-startup-or-small-business-whats-the-difference/?sh=1b799d8926c5> accessed on March 24, 2021.
- Hellmann, T. and Puri, M. (2002), “Venture Capital and the Professionalization of Start-up Firms: Empirical Evidence”, *The Journal of Finance*, Feb., Vol. 57, No.1, pp. 169-197.
- Hubbard, R. G., Garnett, A. M., Lewis, P. and O'Brie A. P. (2015), “Microeconomics”, *Pearson Australia*, Ch. 10, pp. 317.
- Istanbul Development Agency (2020), “Application Guide of Regional Venture Capital Fund Support Program”, Istanbul.
- \_\_\_\_\_ (2020), “Presentation of Entrepreneurship Oriented Program”, Istanbul, Turkey.
- Köhn, A. (2018), “The Determinants of Startup Valuation in the Venture Capital Context: A Systematic Review and Avenues for Future Research”, *Management Review Quarterly*, Vol. 68, pp. 3–36.
- Luque-Fernandez, M. A. (2014), “A Counterfactual Approach for Impact Evaluation”, *Presentation on Counterfactual Framework*, IE Designs & Methods, Case Studies, Department of Epidemiology, Harvard School of Public Health, Boston, MA, USA.
- Manigart, S. and Struyf, C. (1997), “Financing High Technology Startups in Belgium: An Explorative Study”, *Small Business Economics*, April, Vol. 9, No. 2, *European SME Financing: An Overview*, pp. 125-135.
- Mankiw, N. G. (2018), “Principles of Microeconomics”, *Cenage Learning*, pp. 322-328.
- Motohashi, K. (2012), “A Comparative Analysis of Biotechnology Startups between Japan and the US”, *Social Science Japan Journal*, Summer, Vol. 15, No. 2, pp. 219-237.
- OECD, “*Outline of Principles of Impact Evaluation*”, <https://www.oecd.org/dac/evaluation/dcdndep/37671602.pdf> (access on May 03, 2021)
- Official Gazette (2018), “Küçük ve Orta Büyüklükteki İşletmelerin Tanımı, Nitelikleri ve Sınıflandırılması Hakkında Yönetmelikte Değişiklik Yapılmasına Dair Yönetmelik (Regulation for the amendment on the regulation of SMEs’ definition, qualifications and classification)”, 24 June 2018, Vol. 30458.
- Paik, Y. and Woo, H. (2014), “Economic Downturn and Financing Innovative Startup Firms”, *Managerial and Decision Economics*, Vol. 35, No. 2, Special Issue: The Effects of Alternative Investments on Entrepreneurship, Innovation, and Growth, pp. 114-128.
- Pinchot, G. (1983), “Managing for Innovation”, *Marketing Communications*, Vol. 8(6), pp. 35-38.
- Presidency of the Republic of Turkey – Investment Office, 2019, “The State of Turkish Startup Ecosystem: An In-Depth Analysis and Evaluation”, Istanbul, Turkey.

- Republic of Estonia E-Residency Program, “Start a Company”, <https://www.e-resident.gov.ee/start-a-company/> (access on December 23, 2021).
- Schumpeter, J. A. (1934), “The theory of economic development”, *Harvard University Press*, Cambridge, MA.
- Sekhon, J. S. (2007), “The Neyman-Rubin Model of Causal Inference and Estimation via Matching Methods”, *The Oxford Handbook of Political Methodology*.
- Shabangu, S. (2014), “The Importance of Startup Firms for Economic Development”, *LinkedIn Pulse*.
- Startup Amsterdam (2019), “Startup Amsterdam 2019-2023: Strengthening the Startup and Scaleup Ecosystem by Promoting Innovative and Sustainable Entrepreneurship”
- Startup Genome (2021), “The Global Startup Ecosystem Report 2021”.
- \_\_\_\_\_ (2021), “Rankings 2021: Top 100 Emerging Ecosystems”, *The Global Startup Ecosystem Report 2021*, <https://startupgenome.com/article/rankings-2021-top-100-emerging-ecosystems>, access on December 23, 2021.
- Startups.watch (2019), “Turkish Startup Ecosystem v.01”, Istanbul, Turkey.
- \_\_\_\_\_ (2019), “Turkish Startup Ecosystem in Review Report”, Istanbul, Turkey.
- \_\_\_\_\_ (2021), “2020 Year in Review”, Istanbul, Turkey.
- Török, L. and Morris, R. (2019), “Mapping the Istanbul Tech Ecosystem”, *Endeavor Turkey*.
- Van de Ven, A. H., Hudson, R., and Schroeder, D. M. (1984), “Designing New Business Startups: Entrepreneurial, Organizational, and Ecological Considerations”, *Journal of Management*, Vol. 10 (1), pp. 87-108.
- Westlund, H. and Olsson, A. (2011), *Economic Entrepreneurship, Startups and Their Effects on Local Development: The Case of Sweden*.
- World Bank, “Small and Medium Enterprises (SMEs) Finance”, <https://www.worldbank.org/en/topic/sme/finance> (access on March 15, 2020)

## 5. CONCLUSION

The positive performance of businesses in the economy is one of the key factors influencing economic development and growth. A better economic environment is created by the establishment of new firms, the scaling up of present firms, and assisting the fragile ones to survive in the market.

In order to secure sustainable development across regions, entrepreneurs are seen as vital elements of the economy. 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 in the economy directly or indirectly. Therefore, governments use mechanisms that positively affect the drivers of entrepreneurship.

Startups, which undoubtedly differ from traditional enterprises due to its innovative and technological foundations, are usually named SMEs with the potential to grow rapidly. This study intends to question the effectiveness of SMEs and government grants from a different perspective; hence, the study brings startups to the table and investigates if there may be alternative policies for governments to stimulate regional development.

In the first essay, an econometric analysis was conducted to find out how government grants designed to stimulate entrepreneurship affect the number of new firms and new firm birth rate across NUTS-II regions of Turkey. Using a variety of economic development metrics, the results reveal no evidence that such grants are effective in promoting new firm establishment or new firm birth rate. Since the introduction of new resources into the economy is anticipated to improve economic outcomes, the insignificant results in this empirical analysis are surprising.

There are probably multiple explanations for this. The grant itself could be one explanation. Grants may be viewed as free money by entrepreneurs because there is no demand for reimbursement. They choose to just take advantage of the incentive and purchase the machinery and equipment, but they do not seek innovation. Because

business owners are the primary decision-makers, they choose to remain as small businesses rather than scale up or globalize. It is referred to as "dumb money" when only money is invested without the investors contributing any knowledge, network, or time. It is widely assumed that Turkish entrepreneurs consider government grants as dumb money.

In the second essay, while still maintaining a regional approach, SMEs operating in manufacturing industry were analyzed. In line with this background, this essay intends to measure the effectiveness of subsidies allocated to SMEs in manufacturing industry across Istanbul, Marmara Region and Turkey. A counterfactual impact evaluation has been carried out in order to assess the impact of subsidies in a broad perspective in terms of labor force, average labor cost, value added per labor and total exports per labor.

Our findings reveal that, in general, the number of labor recruited and the value added per labor increases during the five year period that our data covers, regardless of regional differences or whether they were subsidized or not. These findings indicate that, while employment is increasing, average labor cost is increasing as well. Regarding the financial support programs and subsidies, our results proved that the treatment group faces negative consequences in labor force recruitment, average labor force and value added per labor. Even though the magnitudes vary across Istanbul, Marmara Region, and Turkey, the signs are consistently negative and significant. When it comes to profit per labor and export per labor, regression outputs give us insignificant results.

Because of the nature of grants and subsidies, firms regard them as "dumb money." As a result, after using such financial tools, SMEs frequently do not aim to keep on growing, creating, and commercializing their products. An angel investment or venture fund, on the other hand, could be an alternative to provide smart money into SMEs. Firms would get access to funding, as well as grow their network, improve management skills, and gain a worldwide perspective, thanks to the injection of smart money (Tam, 2017). Therefore, this essay showed that there is a need for analyzing the impact of smart money on SMEs.

The third essay intends to question the effectiveness of SMEs from a different perspective. Rather than focusing on traditional SMEs, startups and their performance

have been analyzed. In this essay, Istanbul-based ICT startups were interviewed and requested to complete a survey questionnaire. Angel investment or venture capital funds allocated to ICT startups have been studied to see if they have a substantial impact on employment, profit, and income.

First, the performance of startups in terms of employment, profit and income is no doubt positively diverges from traditional SMEs, regardless of getting investment from funds. The trends of both funded and non-funded startups have positive slopes in all aspects. Second, the findings of this study showed that startups which received investment exhibited better performance than the startups which opted not to receive fund. The percentage change in income, profit and labor employment of ICT startups which were funded at the intervention period was way higher than the percentage change of control group.

The strength of this study comes from the fact that no similar study of its kind exists in the Turkish startup environment. Furthermore, these findings add to a limited but growing body of literature on the role of startups and effective distribution of government funds. As previously stated, startups produce innovative products. When compared to products of typical SMEs, such products create higher income, profit, and labor employment. This research could imply that governments may provide funds to businesses that produce higher-value-added goods and services. Thus, governments may choose to become an actor in the startup ecosystem as an angel investor or venture capital; so, it may inject smart money, which leads to increased corporate culture, network, technology and innovative business models. Promising results may be expected since more labor employment and rising income of households are some of the prominent goals of a government.