



THE INSTITUTE OF SOCIAL SCIENCES OF
ANKARA YILDIRIM BEYAZIT UNIVERSITY

**GOVERNMENT INCENTIVES AND EMPLOYMENT IN
SMES, AN ECONOMETRIC ANALYSIS ON TURKEY'S
MANUFACTURING INDUSTRY**

MASTER'S THESIS

ALİ RECAİ DİREKÇİ

DEPARTMENT OF PUBLIC FINANCE

ANKARA, 2022

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Doç. Dr. Abdullah Tırgıl

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APPROVAL PAGE

The thesis study titled "Government Incentives and Employment in SMEs, An Econometric Analysis on Turkey's Manufacturing Industry" prepared by Ali Recai Direkçi was unanimously accepted by the following jury as a master's thesis in the Department of Public Finance at Ankara Yildirim Beyazit University Social Science Institute.

Title Name Surname		Institution	Signature
Assoc. Prof. Abdullah Tirgil		Ankara Yildirim	
Accepted ☐	Rejected ☐	Beyazit University	
Prof. Dr. Halit Yanikkaya		Gebze Technical	
Accepted ☐	Rejected ☐	University	
Assoc. Prof. Derya Fındık		Ankara Yildirim	
Accepted ☐	Rejected ☐	Beyazit University	

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I certify that this thesis fulfills all the requirements to be deemed a master thesis at Ankara Yildirim Beyazit University, Institute of Social Sciences, Department of Public Finance.

Director of the Institute of Social Science

Title Name Surname

PLAGIARISM

I hereby declare that all information in this thesis has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work; otherwise, I accept all legal responsibility. (05.09.2022)

Ali Recai Direkçi



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May Allah routes us in a path on which our consciousness is steadfast and our heart is always open to each other.

ÖZET

Devlet Destekleri ve KOBİ'lerin İstihdamı, Türkiye'nin İmalat Sanayii Üzerine Ekonometrik Bir Analiz

Kamu teşvikleri ülkelerin bölgesel kalkınmadan uluslararası rekabette güçlenmeye kadar çeşitli maksatlar için kullandıkları maliye politikalarıdır. Türkiye 2012 yılından itibaren sektör odaklı uygulanan kamu teşviklerini daha çok bölgesel eşitsizlikleri dengeleme maksadı ile kullanmaya başlamıştır. Bu durum ülke ekonomisinin bölgelerinde ve alt sektörlerinde yapılabilecek yeni analizler için fırsatlar oluşturmaktadır.

Literatürde bölgesel kalkınma için kullanılan teşviklerin etkilerini inceleyen çalışmaların ekseriyeti gelişmiş ülkeler üzerinedir. Türkiye gibi gelişmekte olan ülkeler için yapılmış çalışmaların geneli ise devlet desteklerinin toplam ekonomi üzerine etkilerini incelemektedir. Dolayısı ile literatürde sektör ve bölge bazlı mikro çalışmalara ihtiyaç olduğu açıktır. Bu çalışma bahsedilen ihtiyaca Türkiye'nin imalat sanayinde faaliyet gösteren Küçük ve Orta Ölçekli İşletmeler (KOBİ) örneği ile mikro veri analizi katkısı sağlama niyetindedir.

Türkiye'nin yeni teşvik programının performansı basit bir şekilde incelendiğinde KOBİ'lerin yeni politikalar aracılığı ile istihdamlarını artırmada zorluklar yaşadığı göze çarpmaktadır. Dahası, şirketlerin yıllık istihdam değişiklikleri bölgelerine ve ölçeklerine göre incelendiğinde giderilmesi amaçlanan eşitsizliklerin mevcudiyetini koruduğu görülmektedir. Verilen teşviklerin etkisini daha detaylı incelemek için çalışmada ampirik analizlerde bulunduk. Bu analizleri uyguladığımız veri seti bağımsız bir araştırma şirketinin imalat sanayiindeki KOBİ'ler ile 2016 yılında Sanayi ve Teknoloji Bakanlığı ile iş birliği içinde yapmış olduğu anket çalışmasından gelmektedir. Çalışmada, soruları cevaplayan 10 063 firma üzerinden sektörel ve bölgesel örneklem oluşturulmuştur. Bu veriye ek olarak bölgesel etkilerin kontrolünü sağlayacağımız değişkenleri Türkiye İstatistik Kurumunun (TÜİK) paylaştığı veriler üzerinden oluşturduk.

Edindiğimiz değişkenler arasındaki ilişkiyi incelemek için En Küçük Kareler (EKK) ve potansiyel içsellik şüphesi dolayısı ile Araç Değişken (IV) ekonometrik yaklaşımları uygulanmıştır. EKK yaklaşımı ile edindiğimiz bulgular gösterdi ki genel olarak teşvikler ile firmaların istihdam büyümeleri ve seviyeleri arasında pozitif bir ilişki bulunmakta. IV

yaklaşımında bu sonuçların katsayılarını daha büyük olarak bulduk. İstihdam teşviklerinin etkisi incelendiğinde iki yaklaşımda da tutarlı anlamlılığa sahip sonuçlara ulaşamadık. Son olarak şirketlerin ölçeklerine göre yaptığımız incelemeler 1-19 arası istihdama sahip şirketlerin 20 ve üzeri istihdama sahip şirketlerden biraz daha fazla teşviklerden olumlu etkilendiğini bulduk. Bunlara ek olarak firma karakteristikleri arasında bulunan firma yaşı, kapasite kullanım oranı, firmaların yenilikçi oluşu, makine gelişmişlik düzeyi ve bilişim teknolojileri gelişmişlik düzeylerinin şirketlerin istihdamı üzerinde anlamlı etkileri olduğunu bulduk.

Anahtar kelimeler: Devlet Destekleri, İstihdam Destekleri, İstihdam, İmalat Sanayii, KOBİ'ler, EKK, Araç Değişken Yöntemi, Mikro Veri Analizi.



ABSTRACT

Government Incentives and Employment in SMEs, An Econometric Analysis on Turkey's Manufacturing Industry

From internal regional development to gaining strength in international competition, government incentives are fiscal policy tools that countries implement for many purposes. Turkey changed the focus of incentive programs in 2012 from a sectoral perspective to vanquishing regional disparities. This change brings about opportunities for new studies that could be made on the country's regions and sub-sectors.

Most of the studies in the literature on the relationship between incentives and regional development deal with the data of developed countries. Studies on developing countries generally analyze the effects of public support on overall employment in the economy. Therefore, there is a gap in the literature for micro studies based on regional and sectoral differences. This study aims to add to the literature a micro data analysis on Turkish manufacturing SMEs to narrow the mentioned gap.

When the performance of Turkey's new incentive program is inspected, the first thing to notice is that the Turkish manufacturing SMEs are struggling to create jobs with the help of state support. Furthermore, the objective of balancing inequalities among firms seems to be far away from being accomplished when a basic inspection is made on enterprises' yearly employment changes based on their regions and sizes. We conducted empirical analyses to obtain a more detailed picture of the relationship between firms' employment and government incentives. The dataset used in our analyses comes from the study of an independent research firm in which Turkish manufacturing SMEs were surveyed. The study's sampling is made on 10 063 respondent firms based on their sectors and regions. In addition to the variables derived from the survey study, we obtained variables from the database published by TurkStat to control for the effects of regional differences.

We applied the OLS and for possible endogeneity problems IV approach to analyze the relationship between variables. Our OLS results showed a significantly positive relationship between general incentives and firms' employment. In the IV approach, we found higher coefficients between the variables. We could not find consistently significant results in OLS and IV approaches for employment incentives' effects on SMEs' employment.

Lastly, our findings based on firms' sizes revealed that SMEs with 1 to 19 employees employ more people than SMEs with 20 and more employees. Additional factors that we found to be significantly effective on SME employment are firm-level characteristics: age of the firm, the capacity utilization rate of the firm, innovation, machinery level, and information technologies level of the firm.

Keywords: Government Incentives, Employment Incentives, Employment, Manufacturing Industry, SMEs, OLS, Instrumental Variable, Micro Data Analysis.



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LIST OF ABBREVIATIONS

2SLS	: Two-Staged Least squares
EU	: European Union
GDP	: Gross Domestic Product
GIIS	: General Investment Incentives Scheme
IDA	: Ireland's Industrial Development Agency
IMFC	: International Monetary and Financial Committee
İŞKUR	: Turkish Employment Agency
IV	: Instrumental Variable
IZ	: Industrial Zones for Manufacturing Industry
JTC	: Job Tax Credit
KOSGEB	: Small and Medium Industry Development Organization
LOC	: Locus of Control
NACE	: Nomenclature of Economic Activities
NACH	: Need for Achievement
NUTS	: Nomenclature of Territorial Units for Statistics
OIZ	: Organized Industrial Zones
OLS	: Ordinary Least Squares
PBIIS	: Project-Based Investment Incentives Scheme
RAF	: British Royal Air Force
RDA	: Regional Development Agency
RIIS	: Regional Investment Incentives Scheme
ROE	: Return on Equity
ROI	: Return on Investment
SIIS	: Strategic Investment Incentives Scheme
SME	: Small and Medium Enterprises
TURKSTAT	: Turkish Statistical Institute
VAT	: Value-Added Tax

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1- Introduction

Ideas for the public sector to adjust the employment levels of cities and enterprises go back to the times of the Roman empire. Cicero (BC 106 – BC 43), one of the brightest thinkers of that Roman way of thinking educated, once said planners in government units are more praiseworthy even than philosophers since the planners' works produce jobs (Cicero, 1943). Today, what is being argued is not this precise and descriptive. Rather, it is required to be analyzed thoroughly.

One of the main discords between the two main pillars of schools of economic thought, Keynesian and free-market, is full employment (Greenwald and Stiglitz, 1987). For a long time, debates on employment theories were shaped by the trade-off between inflation and the unemployment rate (Mankiw, 1991). After Milton Friedman (1968) showed that it is more than dubious to assume that there is such a relation between inflation and unemployment, “exploiting the Phillips curve¹” became less desirable (Forder, 2010). Therefore, government interventions through policies to combat unemployment, which happen to be inflationary, were not advised to countries for decades starting from the seventies.

However, in the mid-nineties, micro-level studies showed a short-term relationship between the unemployment rate and inflation (Van der Ploeg, 2005). Furthermore, funds to aid regional development, especially for developing countries, have steadily increased throughout the eighties (Van Heerde and Hudson, 2009). One must analyze the cases one by one to know if public supports are successful. However, let alone help a region to develop, it is evident that state-level support can be successful enough to lure people into building cities in deserts (Stewart, 1996).

Greenwald and Stiglitz (1987) state that for fiscal policy interventions to be well-performed, the guidance of economic theory, which includes micro- and macro-level dimensions to the given problem, is a must. In this respect, this study aims to deliver a micro-level analysis of incentives' effectiveness on employment level and growth with the experiences of Turkish small and medium enterprises² (SMEs) in the manufacturing

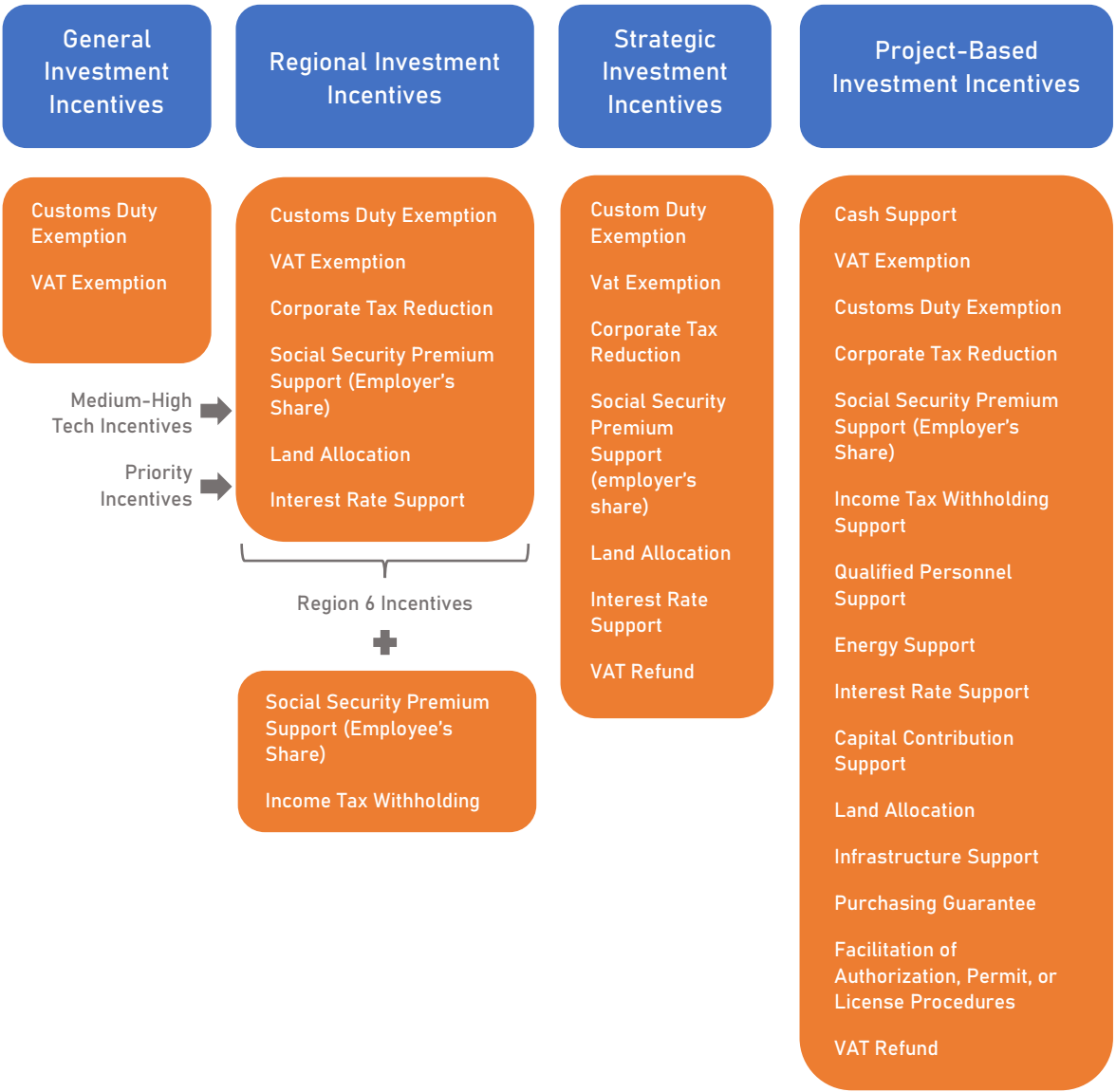
¹ Phillips curve is a concept developed by Bill Phillips (1914-1975) to show inverse relationship between inflation and unemployment.

² SME definition in Turkey comprise firms that have maximum 250 employees and 250 million Turkish liras net profit in a fiscal year (the amount for net profit was 40 million between 2013 and 2016).

industry. We intend to contribute to the literature a piece of humble evidence that hopefully will be helpful for prescient policies in the future. Our study is going to be the first study that considers survey data to test government incentives’ effects on manufacturing SMEs in Turkey.

1.1- Turkey in Action

In Turkey, government incentives are formulated to balance the regional disparities. For this purpose, public authorities consider the country to be classified into six regions



Source: Presidency of the Republic of Turkey, Investment Office, (2022)

Figure 1.1 Incentives provided by government to businesses

which can be categorized as developed (first and second regions), developing (third and fourth regions), and underdeveloped regions (fifth and sixth regions). There are different requirements for firms in each region to be eligible for government support. For example, firms in the first and second regions must have at least one million Turkish liras invested in their businesses to apply for government incentives. For other regions, the amount is half of the first two regions.

Figure 1.1 depicts the types of government incentives given to Turkish businesses. General Investment Incentives Scheme (GIIS) applies to businesses regardless of their region. Instruments within GIIS are tax incentives, and businesses can use them for their transactions except for machinery and equipment purchases. With the new incentive program decreed in 2012¹ (Resmi Gazete, 2012) Regional Investment Incentives Scheme (RIIS) has become the main focus of the Turkish government for aiding regions and firms to develop (Doğan, 2021). The Turkish government offers both tax and non-tax incentives to RIIS applicants. Again, tax exemptions on machinery and equipment purchases are not included in the scope of RIIS.

Strategic Investment Incentives Scheme (SIIS) and Project-Based Investment Incentives Scheme (PBIIS) are designed to smooth the way for much bigger investments. SIIS is to help businesses that are manufacturing or are to manufacture highly imported products in strategically important locations. Under PBIIS, on the other hand, there are prioritized sectors in which if a business has more than 50 million Turkish liras investment, then the firm will be evaluated as if located in the fifth region. For non-prioritized² sectors, the minimum investment amount is 1 billion Turkish liras to be eligible for PBIIS (Ministry of Industry and Technology, 2022a).

There are other channels through which state support is provided to enterprises. First and foremost, non-tax supports, namely interest rate and cash support from the Small and Medium Enterprises Development Organization of Turkey (KOSGEB), are appreciated by many SMEs both in their establishment and expansion. Additionally, Regional Development

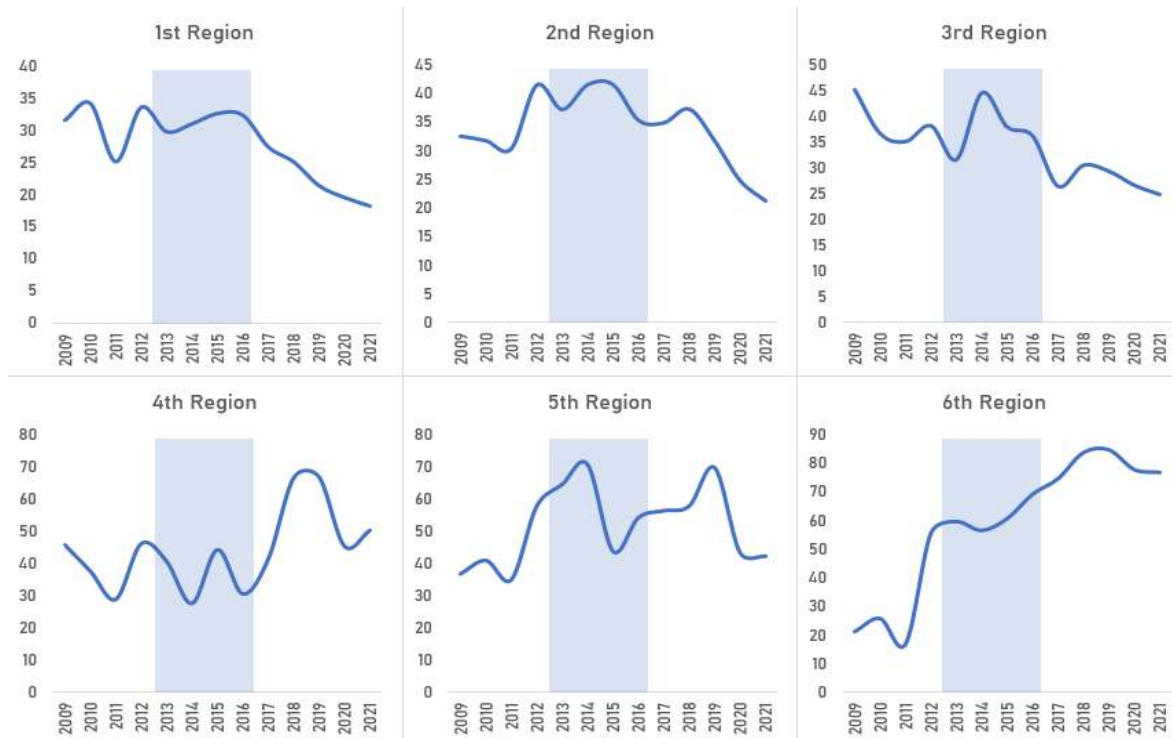
¹ For further information please refer to Appendix 1A

² Non-prioritized sectors are all manufacturing industries except: manufacture of chemicals, pharmaceutical products, computer products, electronic products, optic products, electrical equipment, machinery, and transportation vehicles.

Agencies (RDAs) provide cash support to businesses. Cash support from KOSGEB and RDAs is to partially rebate firms' expenditures.

There are mainly three instruments formulated within policies as employment incentives. The first two are supports for employee's and employer's share in social security premiums. The difference between support for employee's share and employer's share is that government will cover the employee's share based on legal minimum wage if the firm and worker meet the requirements. The coverage is not limited to the share based on the minimum wage calculation for the employer's share. However, it extends to the gross salary of the employee. The third instrument is support for employees' training. This tool covers eligible daily expenses and costs by the Turkish Employment Agency (İŞKUR).

Every firm granted government incentives announces their expected employment in their application forms. Figure 1.2 displays the expected employment per incentive granted to manufacturing firms in each region. The power of incentives to create jobs diminishes in the first three regions. Incentives given to less developed regions are expected to create more jobs. The sixth region's expected employment from a single incentive is 85 more jobs in 2019, almost double the first three regions' highest points.



Source: Ministry of Industry and Technology (2022b)

Figure 1.2 Expected employment per incentive given to manufacturing firms

The area shaded with the blue rectangle in the figures is the timespan of our empirical analysis. As can be seen, fluctuations between 2013 and 2016 are denser than before and after. Realized yearly changes in the number of enterprises and employment shows a slowdown in new entry (left axis) and job creation (right axis) within the manufacturing sector (Figure 1.3). Surprisingly, numbers start to diminish after the year of the new incentive program's introduction. Moreover, in 2016 and 2019, there was negative employment growth among manufacturing SMEs despite the relatively higher increase in enterprises. There could be many reasons regarding how more new entries are associated with less employment. However, the combination of trends in Figure 1.2 and Figure 1.3 leads us to believe that new entries to the manufacturing industry highly go into regions where incentives are expected to create less employment (first, second, and third regions, see Figure 1.2).

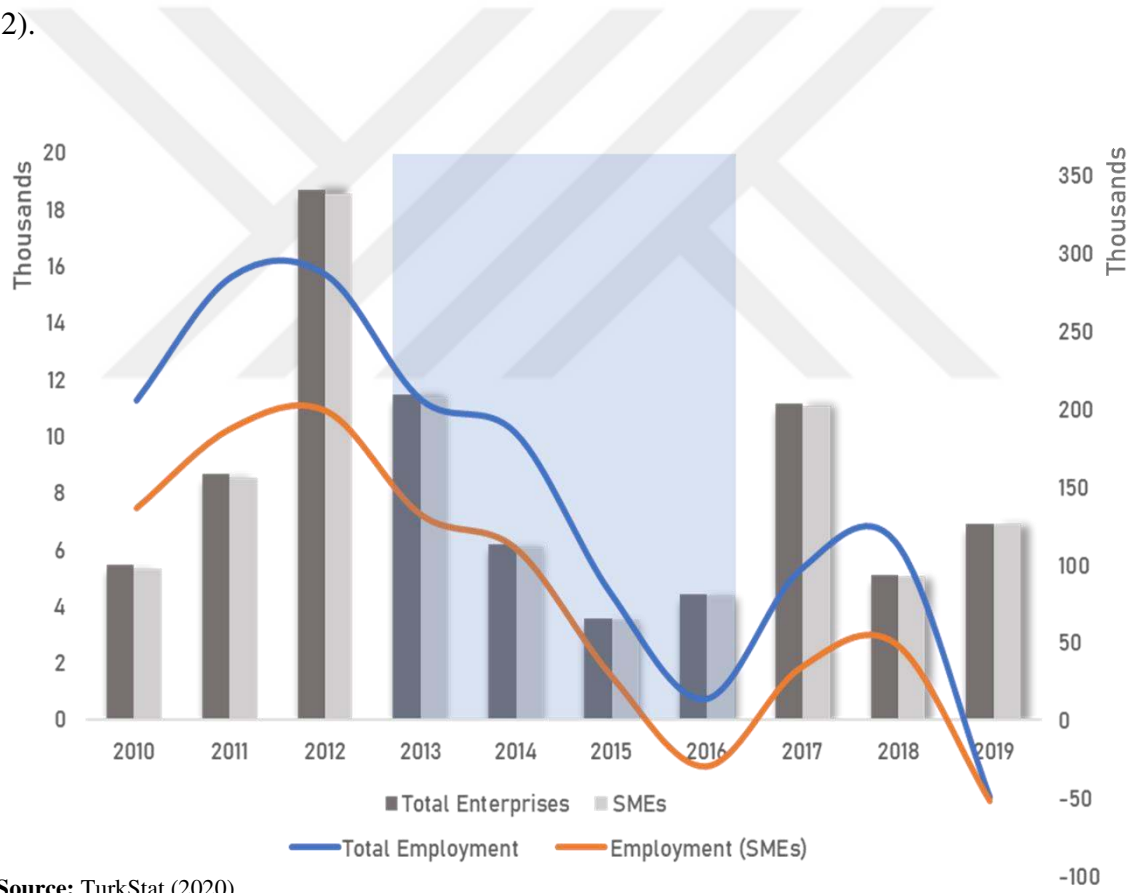
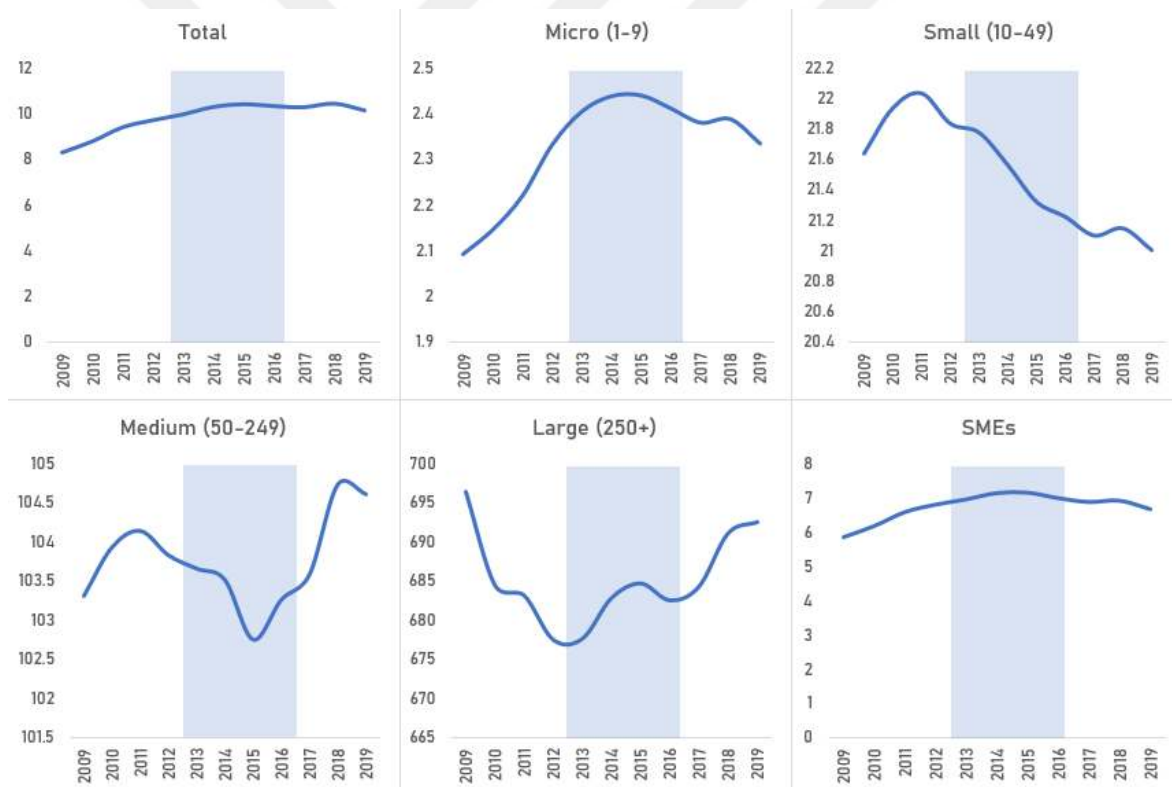


Figure 1.3 Annual change of enterprises and employment (secondary axis) in manufacturing industry

Creating loopholes is possible without tight regulations around new incentive programs (Rees, 2019). To curb existing loopholes and prevent new ones Turkish

government continuously observes and regulates state supports given to businesses under the law numbered 6015 (Resmi Gazete, 2010). However, agriculture, fishery, and services sectors are not included in the scope of the law numbered 6015. This signals for loose control over the incentives provided by public funds.

Most incentives are tailored according to regions and sectors of businesses. The size of businesses is also perceived as important hence there are institutions to assist firms of different sizes (e.g., KOSGEB, centers for microfinance). Looking at Figure 1.4, it is apparent that yearly change of employment per enterprise varies widely among firm clusters of different sizes. Manufacturing firms employ ten people on average. For SMEs, the number is seven. Knowing that more than 99 percent of firms in the manufacturing industry are SMEs, the fate of the manufacturing industry is strongly bounded by the fate of SMEs.



Source: TurkStat (2020)

Figure 1.4 Average employment of firms in manufacturing industry

Clearly, the ultimate objective of government incentives should be to sustain necessities for decent business life for every individual and firm in the economy. However,

this is a dream yet to come true. Therefore, help for the survival of businesses in a bad business climate would be the more realistic expectation from public support.

A very interesting real-life example of survival bias in statistics literature could be a good metaphor for businesses' survival. Gary Smith (2014) shares this example in his book, 'Standard Deviations,' to point out how to collect and read the data. The example is that in World War II British Royal Air Force (RAF) decided to strengthen planes by covering them with more resistant materials to help them to survive German attacks. For this purpose, RAF started to collect data about the location of hit parts on planes that carried out their missions in German-controlled territories and landed back in Britain. The first conclusion of this study was to cover the parts of the plane with bullet and shrapnel holes. Soon RAF realized that there was no point covering hit parts observed on returned planes. Instead, they decided to cover the non-hit location of returned planes since these parts were where the plane was more vulnerable to being shot down and crashed. Based on this metaphor, if planes are the businesses and parts with and without holes are the haves and the have-nots of businesses, maybe it could be wiser to focus a little bit more on what non-survived businesses did not possess. Unfortunately, data on out-of-business enterprises is unavailable to check for possible survival bias, which we think would be nice to have for a more sounding study.

The remaining part of the paper proceeds as follows: the second part examines the related literature. The third chapter concerns the methodology employed for this study and presents the research findings. Finally, concluding remarks are presented in the final section.

2- Literature Review

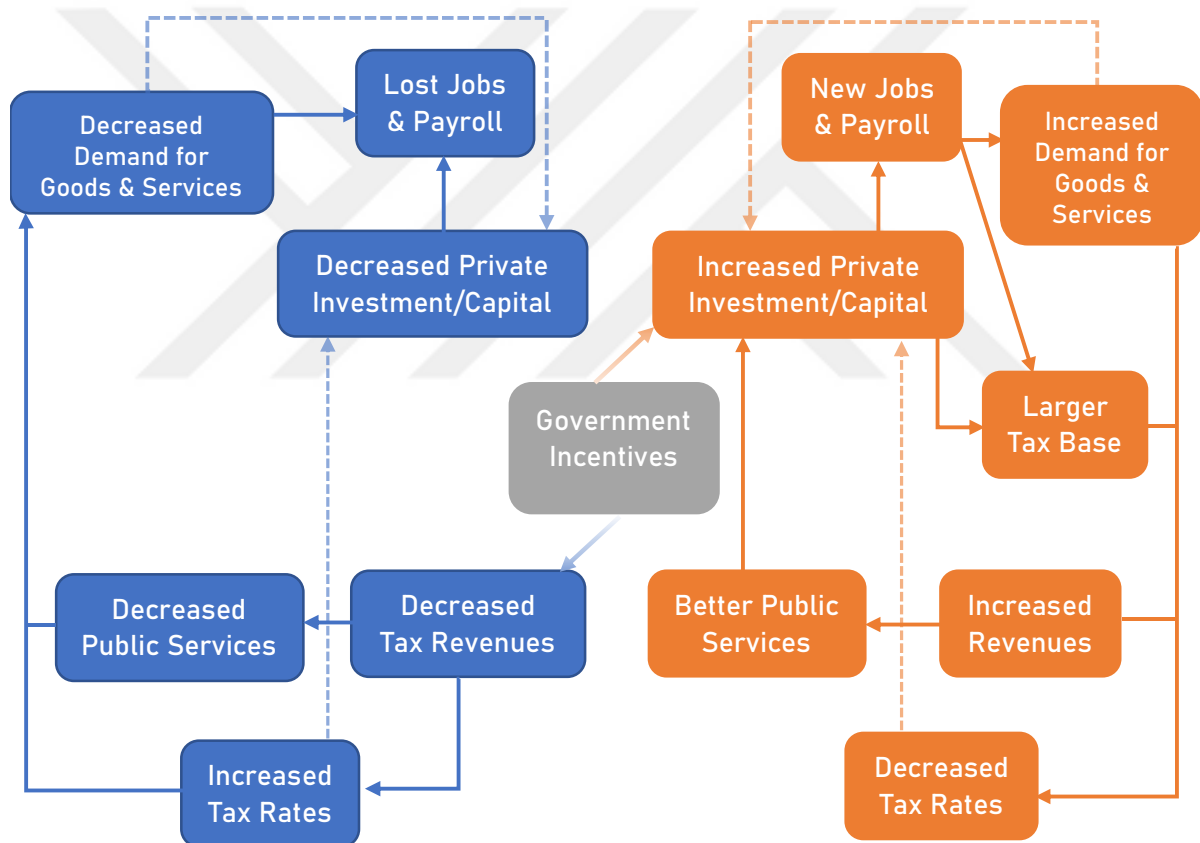
Studies concerning the effects of incentives on employment are vast in the relevant literature. Whether with policy briefs or empirical analysis of an industry for a given period, the academic consensus could be that the effectiveness of incentives is rather conjectural and uncertain (Patrick, 2016). However, it is also important to note that certain structural factors found in studies for manufacturing SMEs contribute more to the national employment level (Voulgaris et al., 2005). In this respect, empirical literature and recent discussions on the relationship between state support and firms' employment growth and level will be elaborated on in this section.

2.1- Empirical Studies

The main distinction among empirical studies appears to be the implementation of a theoretical framework on empirical strategies. For this purpose, we would like to consider and evaluate studies in the literature concerning the authors' approach to government incentives and employment changes. For instance, the main assumption that most of the studies build their argument on is the indisputable lagged effects of incentives on employment (Bartik, 2018). Consequently, studies in the literature have at least three years of difference between the time of enrolment in an incentive program and the level of or change of employment during this period. Therefore, the construction of variable for government incentives in econometric models either starts periodically before the variable for employment level (Westhead and Birley 1995; Hoyt et al. 2008; Courseuil and Moura 2010; Jensen 2016) or establishment-expansion decision of firms in the sample of the study makes the basis for the decision of the time point of variables (Daugney 2002; Gabe and Kraybill 2002; Fukanuma et al. 2006; Gamberoni et al. 2016).

In addition to three years of minimum time for incentives to be effective, Bartik (2018) also argues that 20 years at most would be the maximum time for an incentive's effect could last (positively and negatively). He argues that if a firm has received public funds for locating or relocating its plant to an incentivized location, sooner or later, it will become obvious that this decision is not good for the firm's business plan if the incentive is not updated and repeated in 20 years at most. Therefore, calibration of regional inequalities by one-time incentives could only be conjectural.

At this point, it is important to note that structuring state departments and their actions are almost always held constant with the guidance of theoretical frameworks. Therefore, hypotheses of studies are subjected to binary outcomes from the exercised incentive programs. Figure 2.1 shows possible scenarios for incentives to be job creators or job destructors. It is not always the case that government incentives are formulated to target the alleviation of unemployment rates. However, the biggest expectation from an incentive program to call it successful is the ability of public funds to poke the dynamics of the country's markets. Even unrealistic promises in political campaigns could diminish the number of unemployed citizens without moving a public penny.



Source: Patrick (2016)

Figure 2.1 Theoretical framework of government incentives

Alt (1985) suggests that newly elected and existing governments' political interventions positively affect the unemployment rate. In other words, according to his study, actions that promised to be done have the same effect on the labor market of Great Britain

in the short term. For this effect to be sustained longer, Alt concludes that dominance of the government in the parliament is required.

How locals perceive government policies is crucial for these policies to deliver desired economic prosperity. Trust of governed ones is necessary for the governor to thrust the economy in the planned way. The question here which politicians and institutions have asked is whose trust should be gained (Levi and Stoker, 2000)? Is it the majority of society, some certain groups, or only those loyal to elected ones unconditionally? A study by Walker and Greenstreet (1991) showed that implementing incentives by favoring new manufacturing firms in sub-regions of Appalachia¹ region or sub-sectors leads to intra-regional and intra-sectoral competition. Hence, firms that receive public funds tend to employ skilled workers from other firms with better conditions, which according to Walker and Greenstreet, is wasting resources that were supposed to create jobs. Furthermore, regional imbalances deepen with the transfer of capital from one region to another. So, the question of whose trust should be sought reveals its answer during the exercises of policies if the true intention is to create jobs.

In today's world, the perception of foreigners in governments and national institutions is no less important than that of locals. Consequently, incentivizing foreign investment is another tool for governments to foster employment. In their study, McAleese and McDonald (1978) investigate the factors affecting the employment growth of Ireland's domestic and foreign-owned manufacturing firms and their linkages. Their finding suggests that there is no significantly big difference between newly established domestic firms and foreign firms in terms of firms' responsiveness to policies that are to pace up their development process. Additionally, they found that the effects of government support on foreign manufacturing firms' employment in Ireland are significantly positive. McAleese and McDonald's main policy recommendation boldly stresses that being diligent about targeting the right enterprises will provide long-lasting channels for transferring public funds without wasting even a small portion of them.

Some studies examine the performance of policies and programs based on their aiming capabilities for the best possible entities. The study of Box et al. (1994) is one example in which empirical analysis is made on manufacturing entrepreneurs. Their

¹ The region extends from the South of New York State to Alabama and Georgia in the United States and is called Appalachian Region.

assumption for the best enterprises to deliver public resources is that if the owner of a firm is psychologically thriving for success and routinely discerns changes in her environment, then her firm is a candidate to be the best place. They found that firms owned by people with these attitudes and traits have more employment growth than those who lack these characteristics. For the government incentives' impact on firms' employment growth, they conclude that government supports have a significantly positive effect, but authors claim that these policies are not meticulous enough to aim at firms that are expected to boom. Also, they intuitively suggest that since government incentive programs are mostly designed to capture in-need firms, sectors, and regions, entrepreneurs with 'hunger for success' personalities are hard to find in-need positions except for the early years of their startup.

One example of a study that investigates firms' performance in their starting years is the study of Westhead and Birley (1995). Accepting the literature's consensus that picking winners among new ventures are almost impossible for incentive policies (Smilor and Freeser 1991), Westhead and Birley build their analysis on owner-manager characteristics at startup to see the effect of ambitiousness on development. In line with the accepted consensus, the authors could not find profound results for the relationship between employment growth and owner-manager characteristics. For the effect of incentives on employment growth, Westhead and Birley deduce that manufacturing firms that have been granted public funds tend to have much more employment growth than services firms that raised finance through credits and loans from non-governmental institutions. Subsequently, other factors significantly affecting firms' employment growth are the startup size in the beginning (positively) and the firm's sub-sector for both the services and manufacturing industries.

In contrast to studies that analyze the early years of entities, Gabe and Kraybill (2002) analyze firms that are in their somewhat median age. They found that firms with great expectations of their capabilities to employ more people with the help of governmental support for expansion usually announce overestimated employment growth for the future. Firms act on this behavior to be eligible for incentives, as Gabe and Kraybill state. So, the authors conclude that while incentives positively affect firms' announced employment growth, the sign of the significant correlation between actual growth and government support is negative.

Although they do not include government incentives as a variable in their equations, we think the study of Voulgaris et al. (2005) is important to mention since their country of interest, Greece, has some big similarities¹ with Turkey other than being neighbors. Their study captures the factors that are affecting manufacturing firms' employment growth for the years between 1995 and 1999. Among their findings, there are two which we suspect that our study would yield the same results: the first one is the ability of firms with 1-19 employees to create more jobs than firms with 20 and more employees, and the second is the negative correlation between the age of the firm and employment growth.

Regional differences change the fate of firms' development level as constantly as the world spin around. Hoyt et al. (2008) detect a gap in the literature. They state, '*More recent work was aware of these county and state differences, but authors still often failed to control adequately for these differences.*'. In their study based on firms located in counties of Kentucky, U.S. Hoyt et al. infer a positive relationship between employment and training incentives and tax incentives. The effect of incentives on employment varies from county to county. Border counties of Kentucky are where incentives turn into a larger number of employees. However, an increasing number of employed people comes from businesses located in bordering state counties that are attracted by public funds provided by Kentucky state.

Another purpose of incentives is alleviating disparities between people in the workforce with different conditions. For instance, Lalive et al. (2009) analyzed the effects of Austria's policies to encourage firms to employ disabled workers. They found that implementing such policies leads to more disabled workers' employment. Alas, they also found a decrease in total employment level, which is caused by displacing effect of incentives for disabled workers on non-disabled workers.

In general, studies tend to have samples in which a firm would either receive government support or not. The study of Courseil and Moura (2010) makes an exception for this generalization. Firms in their sample are eligible for the tax incentive program of Brazil but choose not to participate, and firms that are entitled to receive support and are recipients of support. Upon this distinction between firms, they found that firms involved in the

¹ As Christensen (2007) states "...authoritarian histories, military interventions, restrictive media legislation, rapid market liberalization, clientelism, and populist journalism, to name but a few."

program had more employment growth. On the other hand, they found a negative trend in the total employment level of firms eligible to receive support but did not receive it.

Patrick (2014) analyzes how non-tax government supports affect regional employment growth and levels. For this purpose, she created the Incentives Environment Index (IEI). This index captures and shows how local authorities' ability to incentivize businesses affects the county-level employment growth and level. IEI takes larger value if the government is highly capable of using public sources to help firms. Ultimately, Patrick found that increasing the available public funds to help private entities affects rural employment negatively in the medium term. Although Patrick is chary while stating it, one positive outcome from the study is public support's short-term impact on urban county employment level. The author's suggestion for public authorities is to increase the restrictions on eligibility in applying for government support. Other studies in the literature end up with the same recommendation (Burstein and Rolnick, 1995; Thomas, 2010).

There are very few studies that involve employment incentives specifically. The study of Gamberoni et al. (2016) is one example in which authors probe the effectiveness of Spain's 2012 labor market reform on SMEs. Baseline results of the study showed that firms eligible for employment subsidies had 2 percent more employment growth in 2013. Whereas with robustness test results and difference in discontinuities regressions, the authors failed to confirm any significant relationship between employment incentives and employment growth of SMEs. In conclusion, the authors are not skeptical about the long-term effects of the reform as more post-reform data become available.

Jensen (2017) states that without considering any adjustment to the problem of causal inference between incentives and job creation, any research would be similar to a study on the relationship between the reason for death and being in hospital. His solution to this problem is performing "matching methods" to compare firms that are recipients of incentives with firms with similar characteristics but have not received public support. The findings of Jensen showed that firms that participated in the incentive program stated in the survey that they would strongly recommend the program to other firms to enhance their employment. However, the author could not confirm the program's contribution to these recipient firms' employment. Jensen's final verdict is that firms that are granted public funds and have had employment growth would expand their businesses even if they were not incentivized. Therefore, he warns policymakers about the financial burden caused by these programs.

A more recent study that considers several solutions to problems that Jensen (2017) mentions is by Partridge et al. (2020). First and foremost, they utilize Patrick's (2014) IEI as a variable in their study to check the longer effects of incentives. Secondly, they address possible endogeneity problems; hence they isolate the county fixed effects, use Lewbel's (2012) instrumental variable approach, and construct a variable to approximate local demand shocks, also known as the Bartik instrument in the literature. Authors consider new startups in a county as an indicator of job creation. Their findings show that a change in incentives is associated with a negative change in the number of new startups. Especially in the export and manufacturing industries, a negative relationship between new startups and incentives is keenly observed. For future studies, they advise that heterogeneous effects of incentives should be the focal point of the investigation. Furthermore, they suggest that the long-term effects of incentives on SMEs should be a researcher's focus while delivering conclusions to policymakers because larger firms already dominate the incentives arena.

Table 2.1 Summary of literature review on factors affecting firms' employment level and employment growth¹

Author(s) and Title	Sample/Data	Variables	Significant Outcome
McAleese & McDonald (1978) <i>"Employment Growth and The Development of Linkages in Foreign-Owned and Domestic Manufacturing Enterprises"</i>	The sample of the study is foreign-owned and domestic manufacturing enterprises of Ireland. These firms were surveyed between 1966-1974 to make the data for the study.	Employment growth is the dependent variable. Age of the firm , foreign ownership dummy, affiliate purchases, the value of materials purchases, fixed assets per employee, and sector variables are independent variables.	Foreign-owned firms are significant places for employment growth in the Irish economy. Government support through Ireland's Industrial Development Agency (IDA) projects is Ireland's main source for foreign firms to help them establish and grow. Thus, the implication is that government support positively affects the employment growth of the manufacturing enterprises of Ireland.
Alt, James E., (1985) <i>"Political parties, world demand, and unemployment : domestic and international sources of economic activity"</i>	Data from 14 western countries between 1960 and 1983 were used to conclude. Observations in the dataset are monthly observations.	The unemployment rate of a country is the variable that is being explained. Political status and changes such as old and new governments, old and new labor policies, majority/minority governments, and partisan effects are explanatory variables.	Political interventions and external shocks are significantly affecting countries' unemployment levels. For Britain specifically, new governments have a positive but transitory effect on unemployment. However, it has been found that this transitory effect can only be sustained as the new government becomes dominant in the parliament.

¹ **Note:** Variables names with bold characters in the third column are the same variables used in our study.

Author(s) and Title	Sample/Data	Variables	Significant Outcome
Walker & Greenstreet, (1991) <i>"The effect of government incentives and assistance on location and job growth in manufacturing"</i>	New manufacturing firms in the Appalachian region of the U.S. have been surveyed via mail and telephone to build the microdata for the study. The number of firms in the study is 540.	The employment growth of firms is the dependent variable. Wage rate, any type of incentives, per-capita income , effective tax rate, population , percentage of manufacturing, percentage of people with high school degree, percentage of people with a college education , unemployment rate, metropolitan location, number of roads, property tax, and percentage urban are independent variables.	Findings show that incentive offerings can be effective for local firms in the Appalachia region to enhance their employment growth. However, there are some restrictions for the findings to be bold and precise. Authors vehemently suggest that public incentives could cause intra-regional competition, thus wasting resources. Additionally, the authors suspect that incentives could make windfalls to businesses. As a result, income and wealth would be transferred to the region's capital.
Box et al., (1994) <i>"Manufacturing entrepreneurs : an empirical study of the correlates of employment growth in the Tulsa MSA and Rural East Texas"</i>	The study focuses on 327 manufacturing firms in Tulsa and 13 contiguous counties in East Texas.	The dependent variable of the study is the annual employment increase of firms . Independent variables are previous startups, years of experience in business , years of formal education, firm age , years spent in the industry, entrepreneur's need for achievement (nAch), entrepreneur's locus of control (LOC), and entrepreneurs' environmental scanning behavior.	The age of the enterprise, managerial experience, industry experience, and environmental scanning practices are positively related to firms' employment growth.
Westhead & Birley, (1995) <i>"Employment growth in new independent owner-managed firms in Great Britain"</i>	In the data collection process, 744 questionnaires were collected. Firms in the survey are manufacturing and services firms located in Great Britain. The period of the survey design is between 1986 and 1990.	Employment growth is the explained variable. Explanatory variables are incentives , education level of owner-manager, size of the firm , access to finance, industry grants, public venture capital sources, firm entry level of the industry, business failures in the industry, economic sources from family and friends, startup capital grants from the government, diverse supplier bases, competitors' size, environmental characteristics, skilled labor, technology-wise skilled labors, the tax cost of the business, low-cost accounting, and consulting services received.	The study concludes that manufacturing firms that receive public grants are the ones that create jobs. Nevertheless, the authors warn readers about the unclear direction of causality. Hence they call for further investigation.
Gabe & Kraybill, (2002) <i>"The effect of state economic development incentives on employment growth of establishments"</i>	Data of the study is from 366 manufacturing and non-manufacturing firms in Ohio. These firms were selected amongst 2 400 businesses to meet the firm selection criteria ¹ of the firm being expanded between 1993 and 1995.	Actual employment growth and announced employment growth are explained variables of the study. Explanatory variables are government incentives , the value of incentives received per announced job creation, the firm's size, the age of the firm , employment growth of the sector, and the average size of firms in the same sector.	Authors conclude that government incentives do not lead firms to increase their actual employment and may even negatively contribute to their employment level. However, they also found a positive relationship between announced employment level and being incentivized. Based on these two findings, they conclude that businesses tend to misrepresent their employment level to receive government support.

¹ Gabe and Kraybill suspect that authorities may select firms that are above a certain productivity level. Thus, they argue that this way of firm selection would lead results of incentives on employment to be biased.

Author(s) and Title	Sample/Data	Variables	Significant Outcome
Daugney Faulk, (2002) "Do state economic development incentives create jobs? An analysis of state employment tax credits"	The study's sample is firms that participated and were eligible to participate in Georgia's Job Tax Credit (JTC) program between 1993 and 1995.	Employment growth is the dependent variable in the study. Initial employment, plants of the firm, previous participation in the JTC program, being a startup, firm age, rank of the firm in its sector, tax liability, headquarters location, and firm's rank in 1995 are independent variables.	The evidence from the study indicates that government incentives granted to the firms end up with employment growth in these businesses. Also, the firm's size affects the employment change of JTC participant firms.
Voulgaris et al. (2005) "Job Creation and Job Destruction in Greek Manufacturing"	There are 3094 Greek manufacturing firms in the sample. These firms were surveyed about their business characteristics years between 1995-1999.	Employment growth is the dependent variable. The initial employment level in 1995, age of the firm, export activities , gross investment, sales, sales growth, debt to total liabilities, return on investment (ROI) for 1995, change in ROI between 1995-1999, the profit margin in 1995, and change in profit margin years between 1995-1999.	Firms sized with 1-19 employees are more prone to create jobs than firms with 20+ employees. Additionally, the firm's age negatively correlates with Greek manufacturing firms' employment growth.
Fukanuma et al., (2006) "Do governmental financial institutions help startups grow?"	The study's data comes from a survey targeting 15 000 Japanese SMEs. The survey was conducted in 2003. The period of observations in the dataset is 1980 to 2003.	The yearly employment growth of firms is the dependent variable. Government incentives , educational level of the founder, founder's previous experiences, the logarithm of startup funds, capital to asset ratio, a dummy variable for the firm is established as a corporation, a dummy variable for the founder's status of owning properties, having a business plan prior to establishment, a dummy variable for if the firm received public awards, variable for firm's deposits, variable for overcapitalization, a dummy variable for positive profit, region and age of the firm.	Authors found that firms that borrow from government resources tend to grow faster than those which borrow from private lenders. They also conclude that governmental financial institutions are crucial for startup businesses in terms of their productivity enhancement in the long run.
Hoyt et al., (2008) "Business Incentives and Employment: What Incentives Work and Where?"	Firms of Kentucky and their data for years between 1992 and 2004 are the study's sample.	The logarithm of firms' employment level is the dependent variable in the econometric analysis of the study. Incentives , total taxes paid, public expenses for education of located county , location of the firm, and population are explanatory variables of the study.	Depending on where the firm is located, the authors found that training and tax incentives affect employment positively. Firms in border counties are the main places where incentives create much bigger employment opportunities.

Therefore, they sustain random selection by applying Mill's ratio to capture the essential differences in employment changes between the recipient and non-recipient firms.

Author(s) and Title	Sample/Data	Variables	Significant Outcome
Lalive et al., (2009) <i>"Do financial incentives for firms promote employment of disabled workers? A regression discontinuity approach."</i>	The authors use data provided by the Austrian Social security database, which contains employment history and characteristics for the years between 1972 to 2002.	The number of disabled employees is the study's dependent variable. The incentive given by the government to foster and stabilize disabled workers' employment is the main explanatory variable. Control variables are the size of the firm , 30 monthly dummies for time fixed effects, a dummy variable for the hiring strategy of the firm, the governmental quota for disabled workers, region of the firm , sector of the firm , the workforce of the region, educational level of workers, and the number of apprentices in the firm.	It has been found that putting a quota for disabled workers by the government is associated with more disabled workers' employment. However, it has also been found that incentivizing firms to employ disabled workers leads to displacing non-disabled workers and eventually decreasing total employment.
Corseuil & Moura, (2010) <i>"The effects of tax incentives for small firms on employment levels"</i>	Brazilian Institute for Geography and Statistics provides the data for Brazilian SMEs for the years between 1996 to 1999.	The employment growth of firms is the explained variable of the study. Explanatory variables are the firm's eligibility for incentives, a dummy variable for firms' enrollment in incentive programs , the firm's age, plants owned by the firm, and the annual revenue of the firm for each year.	The authors concluded that firms involved in incentive programs had more employment growth. Additionally, the average employment level of firms that were eligible for incentive programs had a relatively negative trend.
Aterido et al. (2011) <i>"Big constraints to small firms' growth? Business environment and employment growth across firms"</i>	Data of the study comes from World Bank Enterprise Surveys. The dataset comprises 80 000 manufacturing firms in more than 110 countries. The year period in the study is between 2000-2006.	The employment growth of firms is the dependent variable in the study. Variables that explain the employment growth are the size of the firm , investment climate, foreign-owned dummy, government-owned dummy, export activities , industry experience, city population , and sector of the firm .	Results show that a bad business climate refrains small, medium, and large businesses' employment growth to enhance. However, said bad business climate is favoring micro firms' employment growth positively. Also, it is found that access to finance has a great positive impact on firms' employment growth no matter what the firm size is.
Carlianne Patrick, (2014) <i>"Does increasing available non-tax economic development incentives result in more jobs?"</i>	Five-year panel data of 48 lower U.S. states which covers 1972-2002, is used in the study.	Employment growth and employment level are the dependent variables in the study to explain job creation. Government incentive is the key independent variable. Region and size of firms are other variables included in the study.	Results of the study suggest that increasing the non-tax incentives impacts rural employment negatively in the medium term. On the contrary, urban areas deliver small short-term benefits from increased incentives.

Author(s) and Title	Sample/Data	Variables	Significant Outcome
Gamberoni et al. (2016) <i>"Firm responses to employment subsidies: a regression discontinuity approach to the 2012 Spanish labor market reform"</i>	Firm-level data derived from 932 033 Spanish firms' balance sheets for the years between 2005-2014 is the used dataset in the study.	The relationship between employment subsidy given by the government in 2012 and firms' employment growth has been analyzed in the study.	The authors could not find a statistically significant result for the relationship between firm-level employment growth and employment incentives.
Jensen Nathan M., (2016) <i>"Job creation and firm-specific location incentives"</i>	The author uses establishment-level data from the state of Kansas and firm-level survey data.	The relationship between employment growth and incentives has been analyzed. Other control variables are the firm's previous employment, sales growth, a dummy variable for the company being a subsidiary, and the firm's sector	The study's main finding is that even though businesses that have been granted incentives recommend the incentive programs to other firms, they did not participate in job creation in Kansas except for very few of them.
Yanikkaya & Karaboga (2017) <i>"The Effectiveness of Investment Incentives in the Turkish Manufacturing Industry"</i>	Authors make their analysis on data which comprehends the period between 1981 and 2009	The study has four dependent variables: the growth rate of labor productivity, the growth rate of capital stock, the growth rate of employment , and total factor productivity. Independent variables are initial state-level labor productivity, initial state-level capital intensity, number of incentives given , import activities, export activities , the logarithm of the total actual input, the firm's sector , and the region .	The study concludes that investment incentives are negatively correlated with a growth rate of labor productivity and capital intensity. As for the relationship between total factor productivity and employment, the authors could not find any significant relationship.
Partridge et al., (2020) <i>"The Effects of State and Local Economic Incentives on Business Start-Ups in the United States: County-Level Evidence"</i>	The study sample is firms that conduct business in 47 cities in 33 states across 45 industries of the U.S.	The dependent variable is the number of startups per capita in a county and a sector. Government incentives , tax burden measured as the percentage of value-added, initial employment level, export activities , local demand shocks, employee changes between sectors, the employment share of sectors, percentage of people with high school degree , percentage of people with a college degree , and percentage of people with bachelor's degree are the other control variables. Authors use the 2000 value of the Incentives Environment Index developed by Patrick (2014) as an instrumental variable.	A negative relationship between incentives and change in total startups in export and manufacturing industries has been found. The authors' suggestion from this finding is that incentives crowd-out new firms. Their findings are that while the state and local tax burden does not affect job creation, local demand shocks and intersectoral job mobility have positive effects.

Author(s) and Title	Sample/Data	Variables	Significant Outcome
Süleyman Uğurlu, (2020) <i>"Do the incentives increase employment? Econometric evidences from Turkey's economy."</i>	Data is for Turkey for the period between 2003 and to first quarter of 2017.	The dependent variable is the employment level . Independent variables are incentives, export activities , and tourism activities.	The author found a significant and positive relationship between employment and government incentives. For the causal relationship, incentives impact employment positively in the long run.
Picas et al., (2021) <i>"Does Tax, Financial, and Government Incentives Impact Long-Term Portuguese SMEs' Sustainable Company Performance?"</i>	Firm-level data of Portuguese SMEs and macroeconomic data of Portugal for the years between 2010 to 2019 are the study's sample.	Return on asset and return on equity are the dependent variables in different equations of the study. Government incentives, employment growth, public health expenditure, public educational expenditure , minimum wage, annual change in gross domestic product, inflation rate, and unemployment rate are independent variables of the study.	Government support was found to be not deterministic for the performance of SMEs. However, state educational expenditure is important for Portuguese SMEs to be profitable.

2.2 Recent Discussions

In 2019, International Monetary and Financial Committee (IMFC) director Guy Ryder evaluated that fiscal policy would become more strongly used by governments since the limited flexibility of monetary policies to ease the way for development goals (IMFC, 2019). Consequently, debates on formulating and implementing incentive programs constantly spread among academia and policymakers with different perspectives. What we want to do in this part is to evaluate these discussions for the mere purpose of enriching our investigation.

Recently, mass migration has been one of the biggest concerns while a government aids its businesses and citizens (ILO, 2020). Once a country accepts to become a host for war-victim thousands and millions of individuals, providing for them is immediately accepted by this country's government (England and Weiner, 2018). These people, of course, come with challenging conditions by which both the country's demand and supply side economies would be disrupted (EBRD, 2018).

Firstly, migrants' bargaining power for wages is much less powerful than locals. Eventually, citizens of the hosting country will be displaced by migrants who are okay to

have their immediate needs only. Bartik (1991) argues that if only a small portion of migrants supply their labor to an increased demand for labor by government incentives, neutralizing incentive effects will occur at the regional level. Furthermore, although it is not desired, internal migration from rural to urban helps an economy balance inequality between households' income (Stark et al., 1991). Once international migration comes in waves, the positive effects of internal migration will be annihilated. As a result, it would be common sense for officials to consider migrants in policy formulation (Andersen, 2005).

Another commonly accepted concern for incentives to be development-oriented is the technological level of enterprises. Spillover effects of public funds granted to tech-savvy firms will force other firms in the same region and sector to consider their productivity levels, including employment levels (Bartik, 1991). In general, competition caused by incentives distorts labor markets' dynamics. However, when this competition is caused by incentives given to high-tech firms, other firms' propensity to invest increases (Weinblat, 2017). Thus, the tradeoff between the cons and pros resulting from the incentives-driven competition favors the pros when the rivalry is between high-tech firms. The most important thing a government should seek is a well-defined intermediate level of technology that can be affordable for SMEs (Schumacher, 2011).

Maybe the worst thing a government encouragement could encounter is discouragement from unofficial authorities that people would authorize them to control their personal affairs with the state. Religious groups are the ones that receive authorization from people widely. Fundamentally, all religions expect believers to voluntarily share their portions of earnings to religious money pools to be reshared to other in-need believers. Almost all secular governments exercise the deregulation of religious institutions (Iannaccone et al., 1997). In return, groups that survived vigorously from deregulations kept their activities in the shadows. To weaken these officially absent groups, leaders of these groups have been sentenced to jail time for tax evasion and such activities (Robbins, 1987). However, the influence of these groups on individuals is still and maybe will always be decisive in their economic decisions. Therefore, religious tendencies of geographies should not be neglected when government incentives target regional development.

In the following section, we will present and discuss our methodology, variable selection and construction, and results from our regression analysis.

3- Methodology

There are many techniques and methods for datasets to yield meaningful estimations. However, the justification of the chosen method is strictly tied to the nature of the data. For this purpose, we will present our dataset, adjustments we have made on variables, econometric models, and the ultimate results of regressions in this section.

3.1- Data

Data used in this study comes from a survey conducted in 2016. There are 10 063 firms involved in the survey. The project of surveying firms is done by a private firm in collaboration with Turkey's Ministry of Science and Technology. Questions in the survey are designed to capture firms' overall condition in their productivity levels and factors that are affecting these levels.

Table 3.1 Characteristics of firms in the survey

Characteristics	Number	Percentage
Size (Number of employees as of 2016)		
1-19 employees	6 194	61.6
20+ employees	3 869	38.4
Age (Number of years passed from the date of establishment)		
≤20 years	6 765	67.2
>20 years	3 298	32.8
Region (Regional location of the firm)		
Marmara Region	3 084	30.6
Central Anatolia Region	1 687	16.8
Aegean Region	1 343	13.3
Black Sea Region	1 213	12.1
Mediterranean Region	1 088	10.8
South-eastern Region	831	8.3
Eastern Region	817	8.1
Sector (Firm's sector in which has operations)		
Manufacture of food products	1 513	15
Manufacture of fabricated metal products	755	7.5
Manufacture of other non-metallic mineral products	675	6.7
Manufacture of textiles	610	6
Repair and installation of machinery and equipment	600	6
Manufacture of wearing apparel	590	5.9
Other sectors* (18 sectors)	5 320	53

Note: Turkey's traditional regional classification is considered for regional characteristics.

*For all sectors' numbers and shares, please refer to Appendix 3A.

Table 3.1 shows an overview of the characteristics of firms in the survey. Firms in our dataset are mostly SMEs. Also, younger firms in the dataset make up the bigger part, with 67.2 percent. As one would expect, firms located in the Marmara region almost make up one-third of our sample since the region includes İstanbul, the most populated city¹ in Turkey. The sector that firms operate in is concentrated on manufacturing food products.

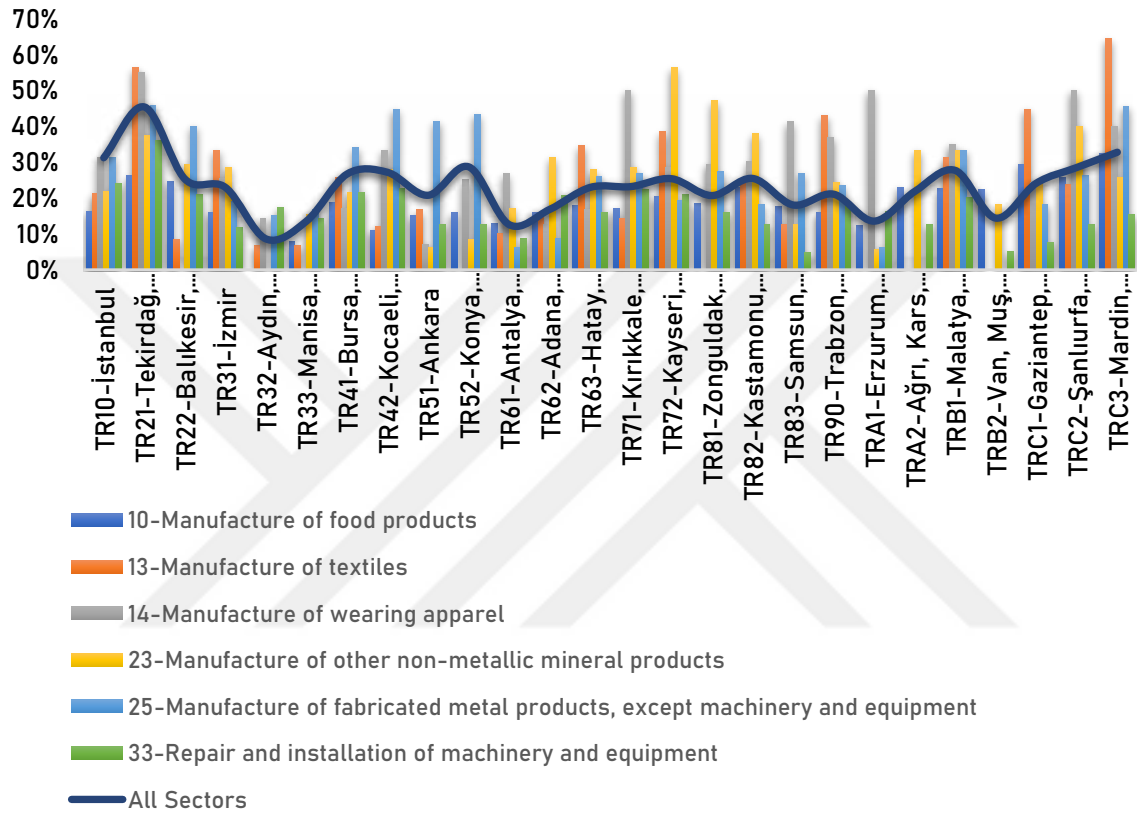


Figure 3.1 Sectoral and regional distribution of firms that received support

Furthermore, from the graph above, we can see that each region in Turkey has one sector to which the government's financial aids flow attentively. For instance, 55 percent of SMEs in Tekirdağ, Edirne, and Kırklareli conducting business in the manufacturing of textiles have confirmed that they have been incentivized between 2013 and 2016. Eventually, our dataset suggests that the Turkish government is seemingly fulfilling its objective of delivering support to pre-planned places and sectors. Nevertheless, the number in the runner-up sector in terms of receiving public support is way below the level of the dominant sector almost in all 26 regions. For instance, half of the firms in the manufacture

¹ Recently, İstanbul has been populated with some number of 15 840 900 as of 2021 (TurkStat, 2021)

of wearing apparel in the TRA1 region (Erzurum, Erzincan, and Bayburt) have been incentivized, and the second sector to that is the manufacture of food products in which only 23 firms of 100 have been incentivized. This situation might be perceived as a focused yet unequal distribution of public funds.

In the survey, firms are asked about their region. In this question, regional classification has been made with the Nomenclature of Territorial Units for Statistics¹ (NUTS) level 2. The figure above shows the firms' shares that confirmed the state support. Almost half of the firms in three cities of the Marmara region (Tekirdağ, Edirne, and Kırklareli) coded with TR21 have received government support between 2013 and 2016. For the lowest share of firms that enjoyed incentives, the region coded with TR32 (Aydın, Denizli, and Muğla) had a percentage of 9.

Firms that responded to the question of *'Have you ever received any support from the government in the past three years?'* as 'yes' have been asked to state which type of support they received. The figure below presents the percentage of firms that received any specific incentive by considering their size. Figure 3.2 exhibits that small-sized enterprises are successful in all their support applications except for two types of incentives: equity and patent and utility model incentives.

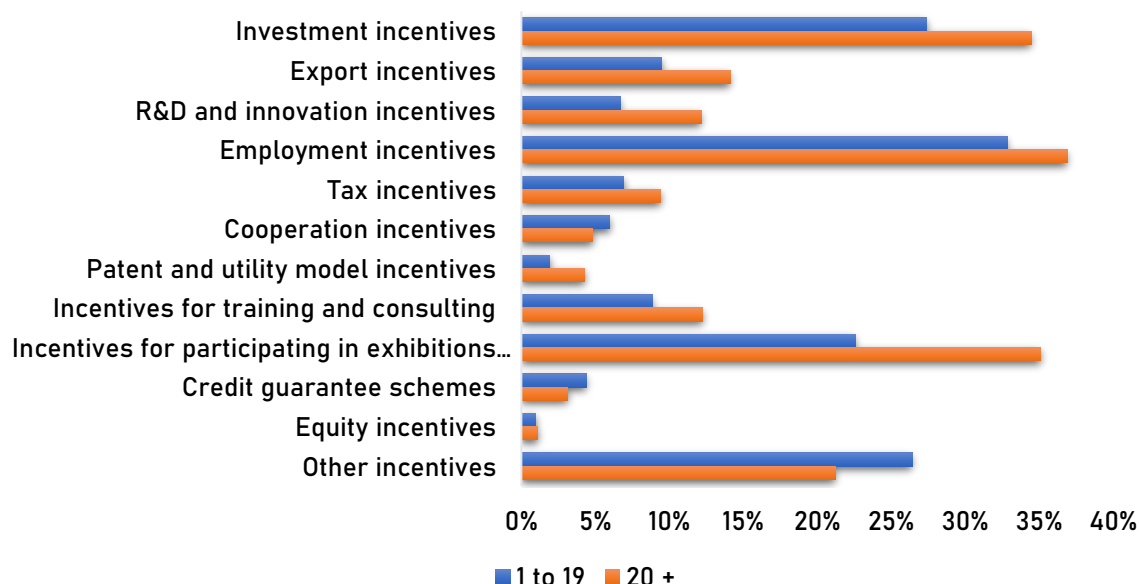


Figure 3.2 Types of incentives firms receive by their size (number of employees)

¹ NUTS classification is a standardization of the European Union for subdividing economic territories (Eurostat).

Regional classification in Turkey's policy formulation differs from the E.U. standard of NUTS classification and the traditional east-west approach. The Turkish government evaluates its regions according to their socio-economic status and potential. Then, the government pursues a prioritization policy of investments to disperse regional inequalities. In this respect, there are six defined regions to direct public funds. Cities in the regions and prioritized activities are being updated as economic circumstances necessitate (Ministry of Industry and Technology, 2021).

On NUTS level 2 and the city level (Appendix 3B) proportion of incentivized businesses differ greatly among regions. However, we get closer percentages when reorganizing our dataset according to the Turkish government's prioritized regions. Nevertheless, businesses in less prioritized regions (first and second regions) obtained more support than the regions where the government wanted to attract investments.

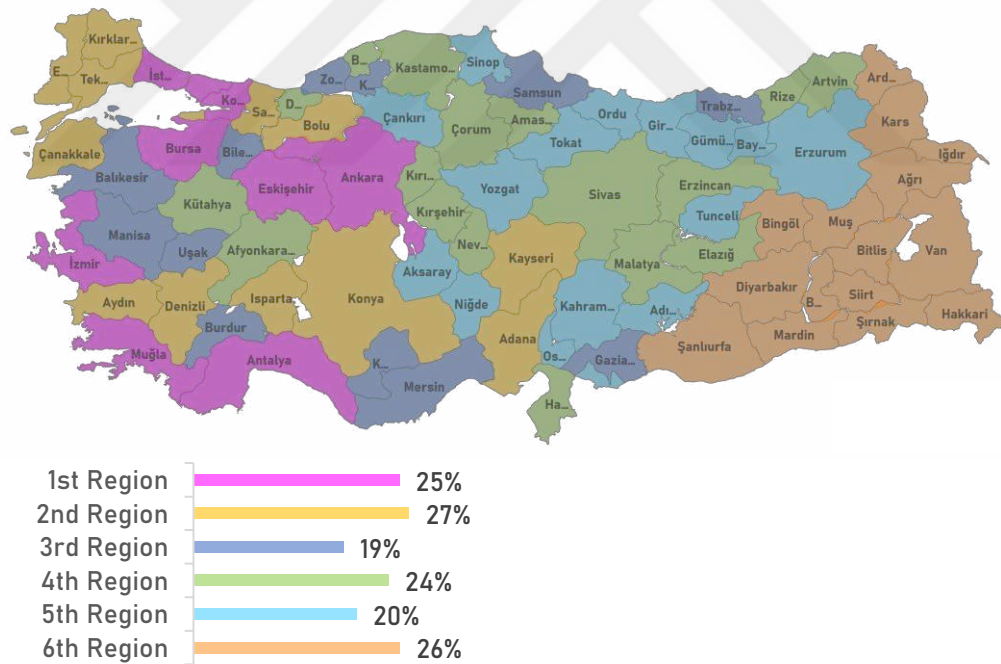


Figure 3.3 Proportion of firms that have been granted any incentive on prioritized regions level¹

¹ In the most recent regional classification Aksaray is in 4th, Manisa, Balıkesir, Bilecik and Karabük are in 2nd, Adıyaman is in 6th, and Rize, Kütahya, Düzce and Kırıkkale are in 3rd the region.

How employment incentives specifically paint the map of Turkey (figure 3.4) by the weight of recipient SMEs' share among the prioritized regions is satisfactory to prioritization policy. However, some minor shortcomings should be noted. For example, the sixth region, which was supposed to be the number one attraction center, had received less government support for enhancing employment than the fifth and the fourth regions.

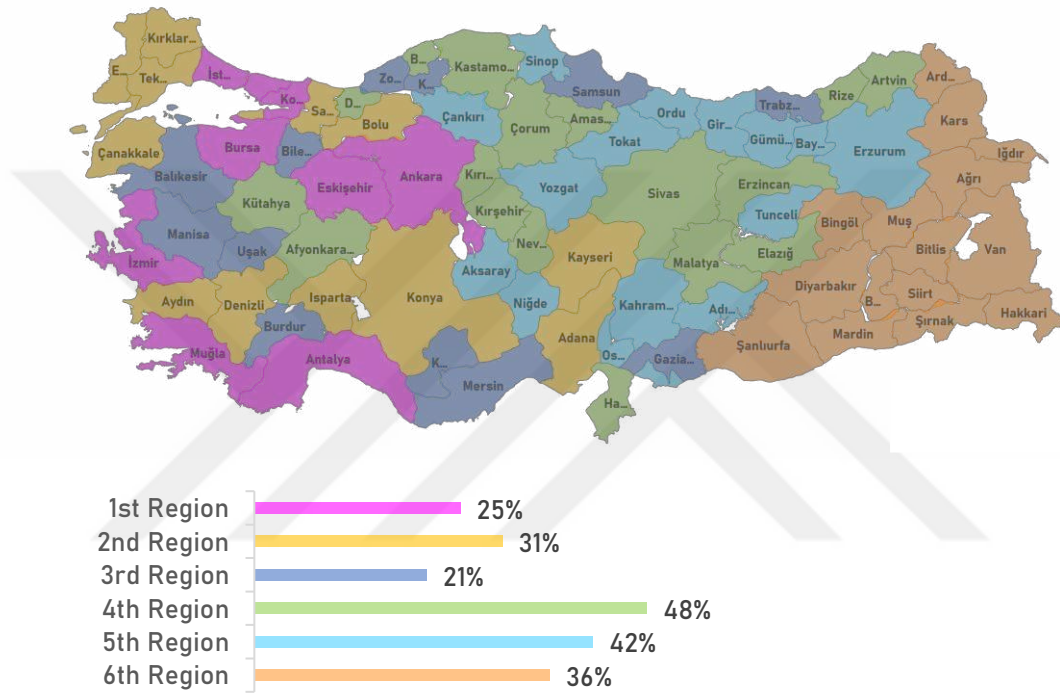


Figure 3.4 Proportion of firms that have been granted employment incentives at prioritized regions level

Overall, the data collected in the survey is satisfactory to our purpose of estimating the effects of government support on firms' employment levels. There are also plenty of variables yielded from the study which we could control for in our models. Additionally, the structure of our dataset and Turkey's institutions' data collection way have made it easy for us to include more regional variables.

In the following section, we present the variables used in this study. Each variable we used has evolved to its final condition as the relevant literature dictated.

3.2- Variables

Our selection of variables aligns with both theoretical and empirical literature (Gabe and Kraybill, 2002). One difference is that rather than replicating models of studies exactly, we expand the number of variables as much as our dataset allows. There are some unanswered questions in the survey which we had to treat as missing. In the following table, we present our variables and their summary statistics.

Table 3.2 Definitions and summary statistics of variables

Variables	Explanation	Obs.	Mean	Std. Dev.
<i>EMPGROWTH</i>	Employment growth between 2013 and 2016 (%)	10 060	.11	.50
<i>LNEMP</i>	Natural logarithm of average employment between 2014 and 2016	10 063	44.72	160.53
<i>LNEMP_2013</i>	Natural logarithm of employment level in 2013	10 060	42.75	154.61
<i>INCENT</i>	Dummy variable for getting any government support between 2013 and 2016 (1 = at least once, 0 = never)	10 063	.24	.43
<i>EMPINCENT</i>	Dummy variable for getting employment support from the government between 2013 and 2016 (1 = at least once, 0 = never)	2 421	.35	.48
<i>AGE</i>	Age of the firm	10 063	18.16	12.04
<i>CAPACITY</i>	Dummy variable for capacity utilization rate for operations in 2015 (1 = %0-25, 2 = %26-50, 3 = %51-75, 4 = %76-100)	10 063	2.97	1.07
<i>EXPORT</i>	Dummy variable for having export activities (1 = yes, 0 = no)	10 063	.30	.46
<i>INNOVATE</i>	Dummy variable for R&D and innovation activities (1 = yes there are, 0 = if there are no activities)	10 063	.23	.42
<i>MACHINE</i>	Dummy variable for level of sufficiency in machinery and equipment (1 = inadequate, 2 = neither inadequate nor adequate, 3 = adequate)	9 688	1.39	.68
<i>TECHINF</i>	Dummy variable for utilization level of information technologies (1 = inadequate, 2 = neither inadequate nor adequate, 3 = adequate)	9 622	1.44	.69

<i>SIZE</i>	Dummy variable for firm size (1 = 20 and more employees, 0 = 1 to 19 employees)	10 063	.33	.47
<i>LN_GDP_PC</i>	The logarithm of the average gross domestic product per capita for years between 2013-2016 at a city level	10 063	9.38	.41
<i>INFLATION</i>	Average inflation rate between the years 2013-2016 on the city level	10 063	.08	.003
<i>LN_EDUCRATE_H</i>	The logarithm of the percentage of people who hold a high school degree or above on the city level	10 063	3.08	.16
<i>LN_EDUCRATE_C</i>	The logarithm of the percentage of people who hold a college degree or above on the city level	10 063	2.56	.23
<i>LN_POPULATION</i>	The logarithm of the average total population of the city where business is located between the years 2013-2016	10 063	13.16	.95
<i>LN_HEALTH_EXP</i>	The logarithm of average public health expenditure between the years 2013-2016 at the city level	10 063	18.13	.83
<i>LN_EDUC_EXP</i>	The logarithm of average public educational expenditure between the years 2013-2016 at the city level	10 063	19.45	.88

The table's first two variables (EMPGROWTH and LNEMP) are our dependent variables. To do our analysis, we transformed firms' average employment levels between 2014 and 2016 to their natural logarithms (LNEMP). In another model, we use the percentage change in the employment level of firms between 2013 and 2016 as a dependent variable (EMPGROWTH). On average, firms in our sample had an 11 percent increase in their employment level over the studied period.

INCENT and EMPINCENT in the table are key independent variables. In one model, we use a variable that captures firms' status of receiving any support from the government between 2013 and 2016 (INCENT). In another model, the variable for employment incentives takes place as the independent variable (EMPINCENT). More than 24 percent of firms have received any support, and 35 percent of these firms stated that they were the recipient of employment incentives specifically. The rest of the variables are our control variables. In the dataset, the average age of firms is 18 years. The mean capacity utilization

level of firms is between 50-75 percent. Every 23 firms out of 100 have innovative activities. Generally, surveyed firms perceive their organization well settled, neither at the machinery level nor in the utilization of information technologies. We also add a natural logarithm of firms' initial employment level (LNEMP_2013) as a control variable in the model where we use the LNEMP variable as the dependent variable.

Furthermore, to control for regional differences, we add some macroeconomic variables at the city level. These are namely, the natural logarithm of average Gross Domestic Product (GDP) per capita between 2013 and 2016 (LN_GDP_PC), average inflation rate between 2013 and 2016 (INFLATION), the percentage of people with a high school degree or above (LN_EDUCRATE_H), the percentage of people with a college degree or above (LN_EDUCRATE_C), the natural logarithm of the average population (LN_POPULATION), and lastly, the natural logarithm of average public expenditures on education and health (LN_EDUC_EXP and LN_HEALTH_EXP).

3.3- Model

Our empirical strategy starts with the ordinary least squares (OLS) method to obtain guideline estimates. The objective at this point is to see the statistical correlation between employment and government incentives. Therefore, we estimate the following model:

$$EMPGROWTH_i = \gamma_0 + \delta INCENT_i + \theta X_i + \Omega Region_r + \beta Sector_s + \epsilon_i \quad (1)$$

Where $EMPGROWTH_i$ refers to employment growth between 2013 and 2016 for the i th manufacturing SME in our dataset, γ_0 stands for the constant term. δ stands for the main coefficients intended to be estimated. We will run $INCENT_i$ and $EMPINCENT_i$ independent variables on $EMPGROWTH_i$ and $LNEMP_i$ separately to obtain δ estimates on which we will build most of our conclusions.

Estimates of control variables are represented by θ . These variables are the firm's employment level in 2013, age, capacity utilization level, export activities, innovation activities, machinery and equipment level, the utilization rate of information technologies, and the size of SMEs. We also add some regional variables to the equation that are represented by $Region_r$. Our selected regional variables are the firm's region, city level average GDP per capita, average inflation rate, percentage of people with high school degree

and above, percentage of people with a college degree and above, population, and public expenditures for health and education. $Sector_s$ controls for sectoral fixed effect.

Since OLS estimates might yield biased estimates of our key independent variables, including any incentives and employment incentives, due to endogeneity issues, we implement instrumental variables analysis. The next section explains the sorts of endogeneity problems we might face.

3.3.1- Endogeneity Problem

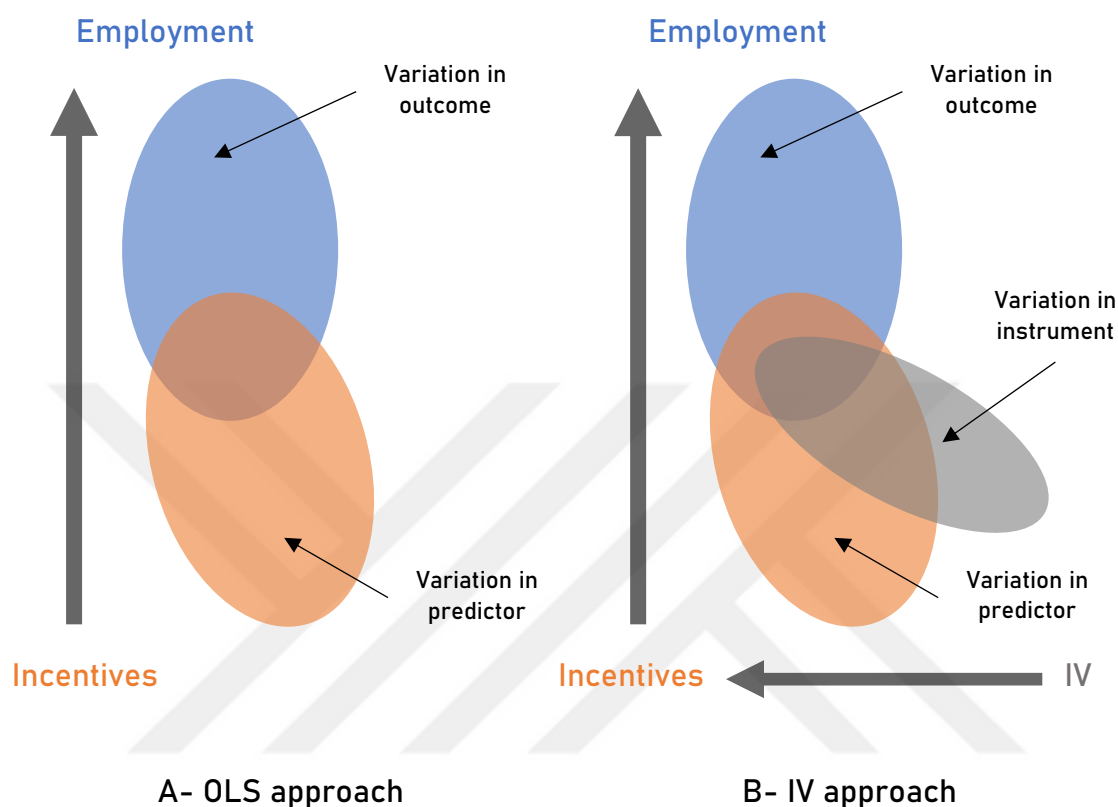
One possible scenario to obtain biased estimates is not meeting the assumption that the independent variable is exogenous (Koop, 2005). In other words, the assumption is that the direction of causality goes from the explanatory variable, which in our case is government incentives, to the dependent variable, which is either the employment growth or employment level in this study, not the other way around.

There might be simultaneity issues in our study, such that firms with higher employment growth or level might be the ones who benefit from employment incentives, which would lead to simultaneity bias in our estimations. Another likely problem with the OLS estimator could be that some unobserved factors in the error term might be correlated with our key independent variables. At the same time, the unobserved factor might be correlated with our dependent variable, which would then cause omitted variables bias.

The empirical literature has vast tools to deal with the correlation between the error term and the explanatory variable. One of them is the instrumental variable (IV) regression approach. In this approach, a researcher needs to find a variable that is correlated with the variable that is suspected to be endogenous and not correlated with the dependent variable directly. Figure 3.4 attempts to describe the distinction between OLS and IV methods.

Ellipses in the figure represent variances of our variables of employment and incentives. Basically, the area which emerges by the intersection of two ellipses represents the explanatory power of the independent variable (orange ellipse) on changes in the dependent variable (blue ellipse). However, we suspect that omitted variables in the error term might be able to find a place in this explanatory power area. Hence, we want to exclude this part; otherwise, we would obtain biased results. By instrumenting another variable (grey ellipse) for our independent variable, we get the new area in which the effects of

unobservable factors are excluded. One of the best ways to do that in the IV approach is the two-stage least squares (2SLS) method (Murnane & Willett, 2010), which is what we applied in our empirical analysis.



Source: Adapted from Murnane & Willett (2010)

Figure 3.5 Graphical representation of the distinction between OLS and IV regression approaches

3.3.2- Selection of Instruments

The main concern while using an instrumental variable is to check whether there are channels, other than interested ones, through which the outcome variable is affected by the instrumental variable (Angrist & Pischke, 2010). Simply put, we must ensure that there is no exogenous variable in omitted variables affecting the SME employment level in our dataset by having a relationship with our instruments.

We select the regional and sectoral average of the dummy variable $INCENT_i$ as our instrumental variable. The logic behind this is the term "contextual effect," meaning that

individual actions are shaped by exogenous characteristics of the involved group (Manski, 1993). In the second equation below, the first stage of the 2SLS regression method is depicted. In this stage, we will obtain fitted values to exclude the effects of omitted variables. Thence, with these fitted values, we will turn back to our original linear regression (equation 1) to obtain estimates from the IV regression approach.

$$INCENT_i = \beta_0 + \beta_1 INCENT_{rs} + \beta_2 X_i + \gamma_1 Sector_s + \vartheta Region_r + \epsilon_i \quad (2)$$

Where $INCENT_{rs}$ stands for the average of the region- and sector-level incentives, and the rest of the variables are defined in equation (1).

The nature of our dataset is highly decisive in our instrumental variable selection. Arguably, there would be better instruments. For example, suppose we could know the time and financial costs of receiving government support for firms. In that case, we could eliminate most bureaucratic factors' effects on the outcome variable. Nevertheless, sectoral and regional average of incentive beneficiaries as an instrument does help us to exclude factors that are related to corruptive exercises of officials, regional factors, and firm-specific business exercises.

The justification of our instrumental variable is hugely based on the ideas of contextual effect (Manski, 1993) and the 'simulated eligibility' approach of Currie and Gruber (1996). The contextual effect suggests that every firm in the same sector and region acts parallel to its rivals in the same clusters. The distinction between the two concepts is that the peer effect implies that firms in the same league are naturally in a race; thus, their actions shape other firms' movement space. As for the notion of simulated eligibility, firms in the same cluster that we created by firm's region and sector are assumed to have the same probability of eligibility for receiving incentives holding firm-level characteristics constant. Therefore, for us to be able to simulate firms' eligibility for government incentives, we need to ensure that our control variables added to the equation are sufficient for handling firm-level idiosyncrasies.

One of the main requirements for the area- and the sector-level instrument used in this analysis to be valid is that it must not be correlated with the error term in employment equations. Assuming area- and sector-level incentives are correlated with firm-level employment other than through their effect on firm-level incentivization, this will bias our

results. A plausible explanation for this might be that our instrument is correlated with other firm- and area- and sector-level characteristics. Therefore, we include many control variables at firm and area levels for our instrument to not correlate with the error term. We think of no other way (except through area- and sector-level) for our instrument to affect firm-level employment; hence, our instrument is not endogenous.

In other words, our firm- and area-level indicators are detailed enough to eliminate any correlation between area-level government incentives and the error term. Furthermore, area-based variations are used as instruments for endogenous explanatory variables, which appear in individual-level equations conditional on related regional variables controlled (Wooldridge, 2002).

3.4- Results from Regression Analyses

Before reporting our main results, we discuss the first-stage estimation results. Our first-stage results are strong throughout our main results, and our F-statistics are well above the recommended levels.

Coefficients for the relationship between receiving any incentive and employment growth between 2013 and 2016 are presented in Table 3.3. According to OLS results, the effects of incentives on employment growth are positive and statistically significant. In the IV approach, the coefficient of our explanatory variable is almost tripled. Basically, what we excluded among the unobservable variables in the error term contributed negatively to our outcome variable in the OLS estimation.

The impact of the years spent in business is negative on employment growth. This estimation is the same in the OLS and IV approaches. A possible explanation for this might be that the experiences of manufacturing SMEs in our sample could lead these enterprises to evaluate the years between 2013 and 2016 for cutting down costs; this is also called passive firm learning in literature (Jovanovic, 1982; Dune et al., 1989; Gabe and Kraybill, 2003).

Other control variables in the study that we found statistical significance in relation to employment growth are capacity utilization levels above 75 percent and innovative activities. According to the results, firms that operated at a capacity level above 75 percent had 4.4 percentage points more employment growth than those that operated between

capacity levels of 0-25 percent. The estimate decreases slightly in the IV approach to 4.3 percentage points. Additionally, innovative SMEs had 6.6 percentage points more employment growth than non-innovative ones, which in the IV approach corresponds to 5 percentage points more than non-innovative firms.

All in all, any government incentive statistically significantly increases SMEs' employment growth in the timespan of 2013-2016. Besides, the operational characteristics of SMEs are also strongly correlated with their employment growth.

Table 3.3 Regression results for the relationship between employment growth and receiving any incentive

	(1)	(2)
<i>(Dependent variable: EMPGROWTH)</i>	OLS	2SLS
<u>INCENT</u>	0.050*** (0.013)	0.140** (0.068)
<i>AGE</i>	-0.003*** (0.000)	-0.003*** (0.000)
<i>CAPACITY (%0-25)</i>	<i>Ref.</i>	<i>Ref.</i>
<i>CAPACITY (%26-50)</i>	-0.015 (0.019)	-0.016 (0.019)
<i>CAPACITY (%51-75)</i>	0.017 (0.018)	0.014 (0.019)
<i>CAPACITY (%75+)</i>	0.044** (0.018)	0.043** (0.017)
<i>EXPORT</i>	-0.017 (0.012)	-0.031* (0.017)
<i>INNOVATE</i>	0.066*** (0.014)	0.050*** (0.019)
<i>MACHINE (inadequate)</i>	<i>Ref.</i>	<i>Ref.</i>
<i>MACHINE (neither inadequate nor adequate)</i>	-0.013 (0.021)	-0.016 (0.021)
<i>MACHINE (adequate)</i>	-0.018 (0.023)	-0.020 (0.023)
<i>TECHINF (inadequate)</i>	<i>Ref.</i>	<i>Ref.</i>
<i>TECHINF (neither inadequate nor adequate)</i>	-0.034 (0.023)	-0.036 (0.023)
<i>TECHINF (adequate)</i>	-0.041 (0.025)	-0.048* (0.025)
<i>SIZE</i>	0.058*** (0.012)	0.046*** (0.015)
<i>LN_GDP_PC</i>	0.077 (0.048)	0.084* (0.049)

<i>INFLATION</i>	-0.200 (0.234)	-0.197 (0.226)
<i>LN_EDUCRATE_H (High school and above)</i>	-0.035 (0.122)	-0.043 (0.122)
<i>LN_EDUCRATE_C (College degree and above)</i>	0.063 (0.101)	0.066 (0.101)
<i>LN_POPULATION</i>	-0.021 (0.050)	-0.020 (0.050)
<i>LN_HEALTH_EXP</i>	-0.049 (0.070)	-0.060 (0.071)
<i>LN_EDUC_EXP</i>	0.059 (0.066)	0.068 (0.066)
<i>SECTOR</i>	<i>Yes</i>	<i>Yes</i>
<i>REGION</i>	<i>Yes</i>	<i>Yes</i>
<i>First-stage regression results</i>	-	0.800*** (0.040)
<i>First-stage F statistics</i>	-	395.37
R-squared	0.033	0.027
N	9429	9429

Note: Robust standard errors are shown in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Table 3.4 below illustrates the impact of employment incentives on employment growth. What stands out in the table is that our number of observations decreases dramatically. The reason is that the question of which type of incentives firms receive is conditional on whether firms receive any incentives. Consequently, we obtained rather weak estimates in regression analysis of employment incentives on employment growth.

We estimated that employment incentives were associated with 5 percentage points more employment growth in the OLS approach in Table 3.4, which is very close to the coefficient we estimated for any incentive on employment growth (see Table 3.3). However, we did not obtain statistically significant estimates for our predictor variable in the IV approach.

How the age of the firms interacts with their employment growth is identical to the results of any incentive (see Table 3.3) in the employment growth model. One big difference is that having export activities is found to be negatively associated with the employment growth of firms. For example, firms that sell their products outside the country would have almost 5 percentage points less employment growth than those that do not export. The empirical literature on the relationship between exports and job creation confirms our findings (Kilkenny and Paltridge, 2009).

The coefficient for the firm's innovativeness is strengthened in this model, and it is almost the same result both in OLS and IV approaches. We can confidently suggest a positive relationship between innovation activities and the generation of job opportunities for the firms in our dataset.

Surprisingly, firms' utilization rate of information technologies turned out to have a negative impact on employment growth. In fact, we have found the sign of the control variable *TECHINF* negative in the previous table (see Table 3.3). However, the result was not statistically significant in OLS approach, and it has a p-value of .10 in the IV approach. Now, when we control *TECHINF* while regressing employment growth on employment incentives, estimates show that firms with an adequate level of information technologies would have 15 percentage points less employment growth than those that utilized information technologies inadequately (see Table 3.4).

Our other control variables resulted in insignificant coefficients. The explanatory power of this model has a larger value than the previous model. Lastly, almost every estimate of variables resulted in an expected sign. However, most likely due to reduced observations, we could not find significant estimates.

Table 3.4 Regression results for the relationship between employment growth and receiving employment incentives

(Dependent variable: <i>EMPGROWTH</i>)	(1) OLS	(2) 2SLS
<u><i>EMPINCENT</i></u>	0.047** (0.023)	0.020 (0.055)
<i>AGE</i>	-0.003*** (0.001)	-0.003*** (0.001)
<i>CAPACITY</i> (%0-25)	<i>Ref.</i>	<i>Ref.</i>
<i>CAPACITY</i> (%26-50)	-0.083 (0.055)	-0.083 (0.054)
<i>CAPACITY</i> (%51-75)	-0.033 (0.052)	-0.032 (0.051)
<i>CAPACITY</i> (%75+)	-0.003 (0.050)	-0.003 (0.049)
<i>EXPORT</i>	-0.049** (0.025)	-0.049** (0.024)
<i>INNOVATE</i>	0.077*** (0.025)	0.076*** (0.024)
<i>MACHINE</i> (inadequate)	<i>Ref.</i>	<i>Ref.</i>
<i>MACHINE</i> (neither inadequate nor adequate)	-0.058 (0.058)	-0.055 (0.058)

<i>MACHINE (adequate)</i>	-0.034 (0.059)	-0.033 (0.059)
<i>TECHINF (inadequate)</i>	<i>Ref.</i>	<i>Ref.</i>
<i>TECHINF (neither inadequate nor adequate)</i>	-0.117 (0.079)	-0.117 (0.078)
<i>TECHINF (adequate)</i>	-0.149* (0.084)	-0.149* (0.083)
<i>SIZE</i>	0.032 (0.023)	0.033 (0.022)
<i>GDP_PC</i>	0.055 (0.104)	0.046 (0.102)
<i>INFLATION</i>	-0.367 (0.832)	-0.359 (0.818)
<i>EDUCRATE_H (High school and above)</i>	-0.343 (0.382)	-0.342 (0.376)
<i>EDUCRATE_C (College degree and above)</i>	0.425 (0.303)	0.426 (0.299)
<i>POPULATION</i>	0.082 (0.125)	0.082 (0.123)
<i>HEALTH_EXP</i>	0.052 (0.190)	0.056 (0.189)
<i>EDUC_EXP</i>	-0.151 (0.179)	-0.156 (0.178)
<i>SECTOR</i>	<i>Yes</i>	<i>Yes</i>
<i>REGION</i>	<i>Yes</i>	<i>Yes</i>
<i>First-stage regression results</i>	-	1.006*** (0.035)
<i>First-stage F statistics</i>	-	803.66
R-squared	0.049	0.049
N	2328	2328

Note: Robust standard errors are shown in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

With the previous two sets of results, we looked at the effect of incentives on the job creation process. Alas, taking employment growth as the explained variable causes to include some non-sustained jobs in firms. In other words, we cannot be sure how many jobs are created by only considering employment growth fluctuations of firms, because of, for example, the possible rehiring of old employees. It could be the case that people who were hired with previous public support before 2013 might have been rehired between 2013 and 2016. In short, we need to consider the probability of public support being exploited.

The next section of the analysis was concerned with the effect of incentives on SMEs' average employment levels between 2014 and 2016. The OLS approach shows that receiving any incentive increases the level of employees by 4.4 percent compared to non-incentivized firms (see Table 3.5). Interestingly, the coefficient is doubled in the IV approach and takes

the value of 0.09. This result may be explained by the fact that the employment levels of manufacturing SMEs in Turkey depended on government incentives between 2014 and 2016.

The association between age and the average employment level of firms between 2014 and 2016 is negative. One more year translates into employment by -0.1 percent. The result is identical in both OLS and IV approaches. Our evaluation for finding a negative coefficient, similar to the negative sign between age and employment growth in previous results, is that SMEs could not sustain a balanced and grown number in overall employment level with the help of government incentives as they go through recessionary times regarding their employment growth between 2013 and 2016.

We found the relationship between capacity and employment level statistically significant and positive. Firms that have operated above 75 percent capacity level had 5.5 percent more employees than those with a capacity utilization level of 0-25 percent. Similarly, according to the IV approach results, SMEs with export and innovative activities employed 1.5 and 4.1 percent more workforce than those which did not pursue such activities. Additionally, the city-level inflation rate has a significant but negative impact on employment.

Table 3.5 Regression results for the relationship between average employment level within 2014-2016 and receiving any incentive

<i>(Dependent variable: LNEMP)</i>	(1) OLS	(2) 2SLS
<u>INCENT</u>	0.044*** (0.006)	0.094*** (0.034)
<i>LNEMP_2013</i>	0.944*** (0.003)	0.941*** (0.004)
<i>AGE</i>	-0.001*** (0.000)	-0.001*** (0.000)
<i>CAPACITY (%0-25)</i>	<i>Ref.</i>	<i>Ref.</i>
<i>CAPACITY (%26-50)</i>	0.006 (0.010)	0.005 (0.010)
<i>CAPACITY (%51-75)</i>	0.039*** (0.010)	0.037*** (0.010)
<i>CAPACITY (%75+)</i>	0.054*** (0.009)	0.055*** (0.009)
<i>EXPORT</i>	0.021*** (0.006)	0.015** (0.007)
<i>INNOVATE</i>	0.049*** (0.007)	0.041*** (0.009)
<i>MACHINE (inadequate)</i>	<i>Ref.</i>	<i>Ref.</i>

<i>MACHINE (neither inadequate nor adequate)</i>	0.008 (0.011)	0.006 (0.011)
<i>MACHINE (adequate)</i>	0.005 (0.011)	0.004 (0.011)
<i>TECHINF (inadequate)</i>	<i>Ref.</i>	<i>Ref.</i>
<i>TECHINF (neither inadequate nor adequate)</i>	0.003 (0.011)	0.002 (0.011)
<i>TECHINF (adequate)</i>	0.014 (0.011)	0.011 (0.011)
<i>SIZE</i>	0.118*** (0.007)	0.117*** (0.008)
<i>GDP_PC</i>	0.013 (0.035)	0.018 (0.036)
<i>INFLATION</i>	-15.475** (6.383)	-16.417** (6.401)
<i>EDUCRATE_H (High school and above)</i>	-0.018 (0.059)	-0.024 (0.059)
<i>EDUCRATE_C (College degree and above)</i>	0.050 (0.061)	0.048 (0.061)
<i>POPULATION</i>	0.035 (0.032)	0.033 (0.032)
<i>HEALTH_EXP</i>	-0.010 (0.041)	-0.003 (0.041)
<i>EDUC_EXP</i>	-0.022 (0.035)	-0.026 (0.035)
<i>SECTOR</i>	<i>Yes</i>	<i>Yes</i>
<i>REGION</i>	<i>Yes</i>	<i>Yes</i>
<i>First-stage regression results</i>	-	0.772*** (0.040)
<i>First-stage F statistics</i>	-	374.80
R-squared	0.969	0.969
N	9429	9429

Note: Robust standard errors are shown in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

When we apply employment incentives as the predictor variable on the employment level of SMEs, we obtain the coefficient value of 0.031 at a significance level of .01 for the OLS approach (Table 3.6). The corresponding value in the 2SLS method is 0.025 ($p > 0.1$). These results imply that employment incentive increases employment by 3.1 percent compared to those firms without employment incentives in the OLS method. However, the insignificant result in the IV approach suggests that the result in the OLS approach is an overestimated value. It can be argued that employment incentives do not contribute to the bilateral relation between incentives in general and employment level, in which a 9.4 percent

linkage was found (Table 3.5). Nevertheless, we are not as confident as we were in previous results regarding estimates' significance level to make wild assumptions.

The relationship between the age of the firm and employment level in 2016 is detected as significantly negative. The estimated effect is identical to the value in general incentives on employment model results.

Likewise to the similar estimates for the age variable, we have observed very close coefficients to the previous model's estimates. For instance, the correlation between the capacity level and total employment is 0.054, which is the same value in both approaches. That is to say, operating at a capacity level above 75 percent and above is bound with almost 5.4 percent more employees than operating at a 0-25 percent capacity level.

As usual, we have found statistically significant correlations between the average employment level of a firm and being occupied with innovative activities. The estimate for innovativeness is a 5.2 percent difference in employment level among innovative and non-innovative SMEs favoring the former.

Table 3.6 Regression results for the relationship between average employment level within 2014-2016 and receiving employment incentives

<i>(Dependent variable: LNEMP)</i>	(1) OLS	(2) 2SLS
<u>EMPINCENT</u>	0.031*** (0.010)	0.025 (0.027)
<i>LNEMP_2013</i>	0.946*** (0.006)	0.946*** (0.006)
<i>AGE</i>	-0.001** (0.000)	-0.001** (0.000)
<i>CAPACITY (%0-25)</i>	<i>Ref.</i>	<i>Ref.</i>
<i>CAPACITY (%26-50)</i>	-0.003 (0.024)	-0.003 (0.023)
<i>CAPACITY (%51-75)</i>	0.027 (0.023)	0.027 (0.023)
<i>CAPACITY (%75+)</i>	0.054** (0.023)	0.054** (0.022)
<i>EXPORT</i>	0.011 (0.011)	0.011 (0.011)
<i>INNOVATE</i>	0.052*** (0.011)	0.052*** (0.011)
<i>MACHINE (inadequate)</i>	<i>Ref.</i>	<i>Ref.</i>
<i>MACHINE (neither inadequate nor adequate)</i>	-0.006 (0.026)	-0.006 (0.026)

<i>MACHINE (adequate)</i>	0.000 (0.026)	0.001 (0.026)
<i>TECHINF (inadequate)</i>	<i>Ref.</i>	<i>Ref.</i>
<i>TECHINF (neither inadequate nor adequate)</i>	-0.031 (0.029)	-0.031 (0.029)
<i>TECHINF (adequate)</i>	-0.027 (0.029)	-0.027 (0.029)
<i>SIZE</i>	0.100*** (0.013)	0.100*** (0.013)
<i>GDP_PC</i>	-0.109 (0.099)	-0.112 (0.095)
<i>INFLATION</i>	-14.737 (10.576)	-14.972 (10.519)
<i>EDUCRATE_H (High school and above)</i>	-0.027 (0.153)	-0.028 (0.150)
<i>EDUCRATE_C (College degree and above)</i>	0.253 (0.182)	0.255 (0.177)
<i>POPULATION</i>	0.129 (0.094)	0.130 (0.091)
<i>HEALTH_EXP</i>	-0.054 (0.103)	-0.054 (0.102)
<i>EDUC_EXP</i>	-0.047 (0.085)	-0.049 (0.084)
<i>SECTOR</i>	<i>Yes</i>	<i>Yes</i>
<i>REGION</i>	<i>Yes</i>	<i>Yes</i>
<i>First-stage regression results</i>	-	1.000*** (0.036)
<i>First-stage F statistics</i>	-	796.32
R-squared	0.971	0.971
N	2328	2328

Note: Robust standard errors are shown in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

In summary, general incentives appear to do much more with firms' employment status than directly employment incentives. There may be various reasons for employment incentives not fulfilling their main goal. However, we cannot baldly say that this is the case with our dataset. Rather, we found out, and want to stress, that incentives play a great role in Turkey's manufacturing SMEs' employment levels regardless of the firm's specific incentive.

In the final part of the analysis, we estimated the coefficients for firms sized 1-19 and 20+ separately. For smaller firms, we found more powerful results than for larger firms. Indeed, this was our expectation since the literature points out that smaller firms are more eager to engage in expansion and development because they are to catch their developed rivals.

The first four columns in Table 3.7 are filled with results from regressions between incentives in general and employment growth and employment level of firms. All estimates in these columns' first row show a significant relationship between any incentive, employment growth, and employment level. Firms' age effect on employment growth is significantly negative, and the relationship between age and employment level is also significantly negative. Also, the capacity level of firms, export activities, and innovativeness impact these firms' employment levels positively. Columns from fifth to eighth show the coefficients for the relation between employment incentives, enterprises' employment growth and levels. Results are again insignificant, as we obtained in analyses without size distinction for employment incentives.

Another significant result we found for firms with 1 to 19 employees is that the inflation rate at the city level is negatively correlated with firms' employment level when we control these variables for the relationship between incentives in general and employment level.

In Table 3.8, we present results for firms sized with 20 and more employees. We could not find significant results between our dependent and key independent variables. The innovative activity variable is the only variable that consistently ends up with positive and significant coefficients in all models.

As we suggested, smaller firms' responsiveness to incentives is stronger than larger firms, implying that targeting smaller firms among SMEs within policies will bring more success to governmental objectives related to regional development. Nevertheless, unclarity for causal relation does not allow us to say when, where, and how these policies turn into public funds and end up in firms' balance sheets. Nevertheless, at least we can confidently say that incentives, in general, are important for Turkish SMEs to level their productivity.

Additionally, our study motivates further studies on job creation in the Turkish manufacturing industry. Especially our findings regarding small-sized firms, having export and innovative activities show that it is worth investigating the long-term effects of incentives by adding more years to the dataset, which also would help to make the aiming of public support more precise.

Table 3.7 Regression results for firms sized 1-19 employees.

	Dependent variable:		Empgrowth		Lnemp		Empgrowth		Lnemp	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS		
<u>INCENT</u>	0.069*** (0.020)	0.181** (0.090)	0.056*** (0.009)	0.111*** (0.046)						
<u>EMPINCENT</u>										
LNEMP_2013			0.935*** (0.004)	0.932*** (0.005)	0.005 (0.033)	0.032 (0.076)	0.013 (0.065)	0.042 (0.140)		
AGE	-0.002*** (0.001)	-0.002*** (0.001)	-0.001*** (0.000)	-0.001*** (0.000)	-0.002 (0.002)	-0.002 (0.002)	-0.000*** (0.001)	-0.000*** (0.001)		
CAPACITY (%0-25)	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.		
CAPACITY (%26-50)	-0.004 (0.023)	-0.005 (0.023)	0.008 (0.012)	0.007 (0.012)	-0.102 (0.081)	-0.103 (0.078)	-0.019 (0.033)	-0.019 (0.032)		
CAPACITY (%51-75)	0.031 (0.022)	0.030 (0.022)	0.048*** (0.012)	0.048*** (0.012)	-0.020 (0.072)	-0.021 (0.070)	0.030 (0.32)	0.029 (0.031)		
CAPACITY (%75+)	0.047** (0.021)	0.047** (0.021)	0.059*** (0.011)	0.060*** (0.011)	-0.031 (0.073)	-0.030 (0.071)	0.046 (0.105)	0.048 (0.102)		
EXPORT	-0.015 (0.016)	-0.031 (0.020)	0.025*** (0.009)	0.019* (0.010)	-0.087** (0.038)	-0.087** (0.037)	0.011 (0.018)	0.011 (0.018)		
INNOVATE	0.070*** (0.020)	0.050* (0.026)	0.058*** (0.010)	0.049*** (0.012)	0.050 (0.043)	0.051 (0.041)	0.064*** (0.019)	0.64*** (0.018)		
MACHINE (inadequate)	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.		
MACHINE (neither inadequate nor adequate)	0.004 (0.024)	0.001 (0.024)	0.017 (0.012)	0.015 (0.012)	-0.018 (0.067)	-0.020 (0.066)	0.019 (0.033)	0.017 (0.032)		
MACHINE (adequate)	-0.023 (0.025)	-0.027 (0.025)	0.006 (0.012)	0.004 (0.012)	0.002 (0.065)	0.001 (0.063)	0.025 (0.033)	0.024 (0.032)		

Table 3.8 Regression results for firms sized 20+ employees.

	Dependent variable:		Empgrowth		Lnemp		Empgrowth		Lnemp	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS		
<u>INCENT</u>	0.026 (0.017)	0.079 (0.109)	0.030*** (0.008)	0.075 (0.047)						
<u>EMPINCENT</u>										
LNEMP_2013			0.958*** (0.005)	0.955*** (0.006)						
AGE	-0.003*** (0.001)	-0.003*** (0.001)	-0.001*** (0.000)	-0.001*** (0.000)	-0.004*** (0.001)	-0.004*** (0.001)	-0.001*** (0.001)	-0.001*** (0.000)	-0.003 (0.037)	-0.003 (0.037)
CAPACITY (%0-25)	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
CAPACITY (%26-50)	-0.043 (0.029)	-0.046 (0.029)	-0.001 (0.018)	-0.003 (0.018)	-0.070 (0.057)	-0.072 (0.056)	-0.001 (0.030)	0.003 (0.029)		
CAPACITY (%51-75)	-0.019 (0.029)	-0.027 (0.033)	0.015 (0.017)	0.010 (0.017)	-0.055 (0.058)	-0.050 (0.057)	0.009 (0.028)	0.010 (0.027)		
CAPACITY (%75+)	0.026 (0.030)	0.023 (0.029)	0.040*** (0.017)	0.038*** (0.016)	0.012 (0.054)	0.014 (0.052)	0.050* (0.027)	0.050* (0.026)		
EXPORT	-0.016 (0.018)	-0.026 (0.030)	0.015* (0.008)	0.009 (0.010)	-0.010 (0.031)	-0.011 (0.030)	0.016 (0.014)	0.015 (0.014)		
INNOVATE	0.058*** (0.018)	0.048* (0.029)	0.036*** (0.009)	0.030*** (0.011)	0.094*** (0.030)	0.089*** (0.029)	0.043*** (0.013)	0.040*** (0.013)		
MACHINE (inadequate)	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
MACHINE (neither inadequate nor adequate)	-0.050 (0.049)	-0.053 (0.049)	-0.020 (0.022)	-0.021 (0.022)	-0.150* (0.090)	-0.137 (0.091)	-0.062 (0.038)	-0.056 (0.038)		
MACHINE (adequate)	-0.016 (0.056)	-0.015 (0.055)	-0.004 (0.023)	-0.003 (0.023)	-0.119 (0.098)	-0.116 (0.096)	-0.052 (0.039)	-0.050 (0.039)		

<i>TECHINF</i> (inadequate)	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
<i>TECHINF</i> (neither inadequate nor adequate)	-0.046 (0.077)	-0.050 (0.076)	0.005 (0.028)	0.001 (0.027)	-0.202 (0.197)	-0.205 (0.194)	-0.045 (0.058)
<i>TECHINF</i> (adequate)	-0.082 (0.083)	-0.089 (0.082)	-0.002 (0.028)	-0.008 (0.028)	-0.258 (0.213)	-0.258 (0.209)	-0.056 (0.060)
<i>LN_GDP_PC</i>	0.049 (0.107)	0.059 (0.117)	-0.006 (0.057)	0.008 (0.059)	0.098 (0.150)	0.064 (0.146)	0.051 (0.095)
<i>INFLATION</i>	-0.443 (0.612)	-0.414 (0.606)	-18.508 (16.518)	-22.442 (16.511)	-0.667 (0.941)	-0.732 (0.857)	-18.384 (39.402)
<i>LN_EDUCRATE_H</i> (High school and above)	0.008 (0.268)	-0.002 (0.264)	-0.027 (0.106)	-0.049 (0.106)	0.299 (0.631)	0.337 (0.621)	0.225 (0.228)
<i>LN_EDUCRATE_C</i> (College degree and above)	-0.125 (0.203)	-0.116 (0.199)	0.063 (0.102)	0.068 (0.102)	-0.395 (0.518)	-0.447 (0.517)	-0.137 (0.232)
<i>LN_POPULATION</i>	0.034 (0.107)	0.035 (0.106)	0.053 (0.060)	0.041 (0.061)	0.139 (0.178)	0.108 (0.181)	0.020 (0.107)
<i>LN_HEALTH_EXP</i>	0.049 (0.159)	0.042 (0.160)	-0.070 (0.079)	-0.051 (0.081)	0.129 (0.313)	0.150 (0.315)	-0.022 (0.135)
<i>LN_EDUC_EXP</i>	-0.067 (0.153)	-0.061 (0.153)	0.004 (0.068)	-0.003 (0.068)	-0.269 (0.252)	-0.259 (0.246)	0.016 (0.125)
<i>SECTOR</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>REGION</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
First-stage regression results		0.969*** (0.089)		0.919*** (0.088)		0.992*** (0.064)	0.982*** (0.064)
First-stage F statistics		119.40		109.86		239.27	233.06
R-squared	0.041	0.039	0.963	0.962	0.109	0.101	0.964
N	3176	3176	3176	3176	1242	1242	1242

Note: Robust standard errors are shown in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Conclusion

Government support to firms as a tool in a government's fiscal policy is becoming increasingly important as monetary policy tools are limited for direct state interventions. In this respect, we analyzed the effectiveness of incentives given to Turkish manufacturing SMEs. Our findings show that SMEs' reliance on incentives to develop and compete is very strong. Consequently, general incentives do help SMEs to grow. However, we could not find strong evidence to suggest the same for employment incentives.

The firm's size in our sample is also an important factor for incentives to be effective. While firms sized 1-19 are more eager to expand with public funds, incentives are less effective for firms with 20 or more employees. Firm-level characteristics such as capacity level, exporting, innovation, and advancement in technology and machinery are other factors that are significantly and positively (except for the export variable) correlated with firms' employment level. This finding urges us to recommend that Turkish officials formulate and implement policies to favor small firms if they have promising characteristics.

Furthermore, regional imbalances are still apparent as less incentivized regions receive more incentives than the regions which are the top priority of public funds. We believe that wealth distribution between these regions could be found more severe if research investigates firms' employment based on their plants instead of their headquarters, which is a tempting inquiry question for further study.

Another topic we build intuition with our study for further investigations is that incentives have longer-term effects on employment. Our intuition is that one could find windfalls in the labor markets of Turkey caused by incentives. Our reasoning for this is our finding on tax and non-tax incentives formulated to ease firms' employment processes. According to our results, employment incentives are relatively ineffective compared to incentives in general. Thus, a study with the dataset for longer periods might find that employment incentives are misused and wasted.

Lastly, data collection on SMEs that went out of business could help studies to shed a brighter light on the relationship between incentives and employment.

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APPENDICES

Appendix 1A Detailed information about current Regional Investment Incentive Scheme

1 st Region	2 nd Region	3 rd Region	4 th Region	5 th Region	6 th Region
Ankara Antalya Bursa Eskişehir İstanbul İzmir Kocaeli Muğla	Adana Aydın Bolu Çanakkale Denizli Edirne Isparta Kayseri Kırklareli Konya Sakarya Tekirdağ Yalova	Balıkesir Bilecik Burdur Gaziantep Karabük Karaman Manisa Mersin Samsun Trabzon Uşak Zonguldak	Afyonkarahisar Amasya Artvin Bartın Çorum Düzce Elâzığ Erzincan Hatay Kastamonu Kırıkkale Kırşehir Kütahya Malatya Nevşehir Rize Sivas	Adıyaman Aksaray Bayburt Çankırı Erzurum Giresun Gümüşhane Kahramanmaraş Kilis Niğde Ordu Osmaniye Sinop Tokat Tunceli Yozgat	Ağrı Ardahan Batman Bingöl Bitlis Diyarbakır Hakkâri İğdır Kars Mardin Muş Siirt Şanlıurfa Şırnak Van
8 Provinces	13 Provinces	12 Provinces	17 Provinces	16 Provinces	15 Provinces

Provided Supports Within Regional Investment Incentive Scheme								
Incentive Tools			Regions					
			I	II	III	IV	V	VI
VAT Exemption			✓	✓	✓	✓	✓	✓
Customs Duty Exemption			✓	✓	✓	✓	✓	✓
Tax Reduction	Rate of Contribution to Investment (%)	Out of OIZ and IZ*	15	20	25	30	40	50
		Within OIZ and IZ*	20	25	30	40	50	55
Social Security Premium Support (Employer’s Share)		Out of OIZ and IZ*	2 years	3 years	5 years	6 years	7 years	10 years
		Within OIZ and IZ*	3 years	5 years	6 years	7 years	10 years	12 years
Land Allocation			✓	✓	✓	✓	✓	✓
Interest Rate Support	TRY Denominated Loans		-	-	3 points	4 points	5 points	7 points
	FX Loans				1 point	1 point	2 points	2 points
Social Security Premium Support (Employee’s Share)			-	-	-	-	-	10 years
Income Tax Withholding			-	-	-	-	-	10 years

*OIZ: Organized Industrial Zones, IZ: Industrial Zones for manufacturing industry

Source: Ministry of Industry and Technology, Retrieved from:

https://tim.org.tr/files/downloads/ihracat_destekleri/Yat%C4%B1r%C4%B1m%20Te%C5%9Fvik%20Sistemi.pdf

Appendix 3A Distribution of firms in sectors (firms in sample)

Sectors	Number	Percentage
10- Manufacture of food products	1 513	15
11- Manufacture of beverages	175	1.7
12- Manufacture of tobacco products	2	0
13- Manufacture of textiles	610	6
14- Manufacture of wearing apparel	590	5.8
15- Manufacture of leather and related products	446	4.4
16- Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	447	4.4
17- Manufacture of paper and paper products	230	2.3
18- Printing and reproduction of recorded media	358	3.5
19- Manufacture of coke and refined petroleum products	100	1.1
20- Manufacture of chemicals and chemical products	281	2.8
21- Manufacture of basic pharmaceutical products and pharmaceutical preparations	108	1.1
22- Manufacture of rubber and plastic products	580	5.8
23- Manufacture of other non-metallic mineral products	675	6.7
24- Manufacture of basic metals	391	3.9
25- Manufacture of fabricated metal products	755	7.5
26- Manufacture of computer, electronic and optical products	213	2.1
27- Manufacture of electrical equipment	283	2.8
28- Manufacture of machinery and equipment n.e.c.*	421	4.2
29- Manufacture of motor vehicles, trailers and semi-trailers	279	2.8
30- Manufacture of other transport equipment	189	1.9
31- Manufacture of furniture	539	5.4
32- Other manufacturing	278	2.8
33- Repair and installation of machinery and equipment	600	6

Note: Two digits before sectors' name represents E.U. standard of nomenclature of productive economic activities codes (NACE).

*Not elsewhere classified

Appendix 3B Distribution of incentive recipients on city level (firms in sample)

