

**FIRM SIZE, GROWTH AND FINANCIAL CONSTRAINTS:**

**IS TURKEY SPECIAL?**

by

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Access to Finance; Financial Constraints

**Abstract**

In this thesis, I analyze the relationship of firm size and age with firm growth, as well as the effects of financial and regulatory environment on firm growth, with an emphasis on Turkish firms. Using the Enterprise Surveys' firm level data, I investigate whether Turkish firms are different than countries with similar development levels in terms of employment growth rates of firms. Studies suggest that SMEs in Turkey consider constraints on access to finance as a major obstacle on growth. This paper shows that the effects of financial and regulatory environment on firm growth in Turkey are not significantly different than other countries. Furthermore, I find that these effects that are present on international level diminish as firm age increases.

# **FİRMA BÜYÜKLÜĞÜ, BÜYÜME VE FİNANSAL KISITLAMALAR: TÜRKİYE ÖZEL Mİ?**

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*Anahtar Kelimeler:* Küçük ve Orta Büyüklükte İşletmeler; Firma Büyüklüğü; Firma Büyümesi; Finansmana Erişim; Finansal Kısıtlamalar

## **Özet**

Bu tezde, firma büyüklüğü ve yaşının firma büyümesi ile ilişkisi ve finansal ve düzenleyici ortamın firma büyümesine olan etkileri Türk firmaları üzerine vurgu yapılarak incelenmektedir. Türk firmalarının çalışan sayısının büyüme oranlarının Türkiye ile benzer gelişmişlik düzeyindeki ülkelerin firmalarının çalışan sayısının büyüme oranı ile farklı olup olmadığı Enterprise Surveys verileri kullanılarak araştırılmıştır. Bir çok çalışma Türkiye'deki KOBİlerin büyüme önündeki en büyük engelin finansmana erişim olduğunu düşündüğünü öne sürer. Bu çalışma, Türkiye'deki finansal ve düzenleyici ortamın firma büyümesi üzerinde yarattığı etkilerin başka ülkelerden kayda değer şekilde bir fark yaratmadığını göstermektedir. Bunun yanı sıra, uluslararası seviyede görülen bu etkiler firma yaşı arttıkça azalmaktadır.

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## 1. Introduction

The dynamics of firm growth is an essential topic for economics. One of the stylized facts is that; employment growth rates have an inverse relationship with firm size and age. The reasoning behind this observation can be explained by diminishing returns to scale and knowledge. Many studies, such as Jovanovic (1982), state that diminishing returns to scale and bounded efficiency may be the cause of the inverse relationship between firm size and employment growth. Jovanovic (1982) also explains that firms learn their efficient size and adjust accordingly whereas less efficient firms leave the market. Therefore small and newer firms have a higher growth rate.

Access to finance and the regulatory environment are some of the most important factors that affect firm growth. In the case of developing countries, financial market deficiencies are usually suggested as causes for low growth rates. Limited access to finance can impair firms' growth performance and prevent them from realizing their full potential. Red tape, bribery and other regulatory deficiencies can help to explain the differences in growth rates between firms, or even countries.

Beck and Demirgüç-Kunt (2006) suggest that small and medium enterprises (SMEs) suffer more from financial market deficiencies and regulations than large firms. SMEs are considered a crucial part of economic growth, especially in the developing countries. The European Commission considers any firm that has lower than 250 employees as an SME. Although there might be additional criteria such as industry, ownership structure and revenue, most of the countries (including Turkey) use 250 employees as a threshold for SME definition. By this definition, 99% of the firms in the world are SMEs.

Turkey is a developing economy which relies heavily on SMEs. SMEs account for 78% of employment, 55% of value added, 65.5% of total sales and 50% of total investments in Turkey.<sup>1</sup> However they only account for close to 25% share of total credits in Turkey.<sup>2</sup> As a comparison, SMEs account for 67% of employment and 58% of

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<sup>1</sup> Turkish Statistical Institute (TUİK 2008 Sanayi ve Hizmet İstatistikleri)

<sup>2</sup> Banking Regulation and Supervision Agency (BDDK Türk Bankacılık Sektörü Genel Görünümü – Eylül 2010)

value added in European Union. Their share of total credits is close to 40%.<sup>3</sup> Many studies performed by World Bank show that, developing countries such as Brazil, Chile and Hungary exhibit financial constraints on firms similar to Turkey. According to the World Enterprise Survey, 25% of Turkish firms state that access to finance is the biggest obstacle faced by them, whereas only 13% of Brazilian firms chose the same answer in 2008. However, when the survey asks to what degree is access to finance an obstacle to the current operations of the firm, 55% of Brazilian firms answered that it is a severe obstacle whereas only 14% of Turkish firms responded with the same answer. Since the nature of the question is different, these two results may not contradict with one another. It can be concluded that firms in both of these countries experience financial constraints on growth. Therefore Turkey exhibits a great example of financial market imperfections in developing countries.

Paulo Guilherme Correa and Murat Şeker (2010) investigate firm growth in Turkey with a special focus on small and medium enterprises (SMEs). Using firm level data from the Enterprise Surveys, they argue that small and medium enterprises in Turkey have slower growth rates compared to those in several countries from Eastern Europe and Central Asia (ECA).<sup>4</sup> They also argue that the investment climate can be the main reason of this irregularity and state that improved access to finance is the most important factor that increases firm growth. In order to show the effects of financial variables on SME growth, they perform regressions with firm level data only for Turkey. Therefore their results cannot be used as a justification for reasons of the suggested SME growth rate disparity between Turkey and other countries.

This study considers the Correa and Şeker (2010) paper as a starting point and follows their methodology to some extent. The main purpose of this paper is to compare the firm level growth performance of Turkey with other countries, focusing on the effects of access to finance and the regulatory environment, analyzing whether they create a significant difference in terms of firm growth. Similar to the Correa and Şeker,

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<sup>3</sup> The European Central Bank: Survey on the access to finance of SMEs in Euro Area – November 2012

<sup>4</sup> Actually, their results do not support their claim. They show that difference of growth rates between micro firms and SMEs is higher in Turkey than other countries. Using their results, it is not possible to find significant differences between Turkey and ECA region countries in terms of growth rates of SMEs.

this paper will put special emphasis on SMEs. Following the extensive literature on this subject, I will first analyze the relationship between firm size, age and structure and, growth rates. This analysis will include comparisons of Turkey with other countries, as performed in Correa and Şeker. There are some major differences between Correa and Şeker and this paper. This paper will compare Turkey with countries which are at a comparably similar economic level, whereas Correa and Şeker uses countries from Eastern Europe and Central Asia. An important difference between the two studies is that, this paper will provide a comparative analysis between Turkey and other countries in terms of the effects of access to finance and regulatory variables on firm growth rates, which will be the main focus of this paper. The analysis performed in the paper shows that although there are some differences between Turkey and other countries in terms of growth rates and the growth-size relationship, these differences are not explained by access to finance and regulatory variables. Another difference of this paper is that, in order to address the potential problem of endogeneity, this paper uses location-size-sector averages in addition to the actual variables and location-sector averages used in Correa and Şeker. This method will be explained in the fifth section, which is very similar to the method used in Aterido, Hallward-Driemeier, Pages (2009).

The rest of the paper is organized as follows: Section 2 will provide a literature review. Section 3 explains the data, selection of the countries and provides descriptive statistics. Section 4 will analyze the relationship between firm growth and firm size. Section 5 will investigate the effects of firm age within size groups. Section 6 analyzes the role of financial and regulatory environment in firm growth. Section 7 will insert the role of firm age into financial and regulatory variables. Finally, Section 8 will provide concluding remarks.

## **2. Literature Review**

There is a great deal of literature on the subject of firm growth and financial and regulatory obstacles on firm growth. Early work analyzes the relationship of firm employment growth with firm characteristics such as size, age and ownership status. Robert Gibrat (1931) states that size of a firm and its growth rate are independent, a hypothesis that is known as Gibrat's Law. Hart and Prais (1956) provide evidence that there is no significant relationship between firm size and firm growth. Many papers in

the literature such as Simon and Bonini (1958) and Lucas (1967) assume that Gibrat's Law holds. Scherer (1980) is one of the pioneers stating that Gibrat's Law may not hold, especially for small firms.

Jovanovic (1982) provides a theory of selection with incomplete information that is consistent with the evidence that small firms have higher growth rates than large firms. He argues that firms differ in size because some firms discover their efficiencies over time. Efficient firms grow and survive; inefficient firms decline and fail. During the process of learning the efficient scale of operation, surviving small firms experience higher growth rates. The same reasoning can also be used to explain the inverse relation between firm age and growth rates. Theory also states that small firms are less likely to survive than large firms.

Evans (1987) uses a sample of manufacturing firms between 1976-1982 to investigate the relationship of firm growth with firm size and age. He finds that firm growth has an inverse relationship with firm size and age. The strength of this relationship changes with firm age. Some studies such as Kumar (1985), Evans (1986) and Hall (1987) also provide similar results.

Dunne, Roberts, Samuelson (1989) analyze patterns of post entry employment growth for over 200000 plants in the US manufacturing sector that entered between 1967 and 1977. They find that patterns of growth and failure are significantly affected by firm characteristics. As firm size and age increases, both plant failure rates and employment growth rates of nonfailing plants decrease. They state that the net effect of these two forces determines the expected growth rate of a plant. They also find that growth rates decrease with size for plants owned by single-plant firms whereas it increases with size for plants owned by multiplant firms.

Starting from the 1990s, studies shift their focus on financial and regulatory constraints on firm growth. Along with many other economists, Thorsten Beck, Asli Demirgüç-Kunt and Vojislav Maksimovic provide numerous studies on this subject. Demirgüç-Kunt and Maksimovic (1996) provide an empirical study on decisions of investment financing between countries and whether differences in financial systems and legal institutions across countries affect the ability of firms to grow faster. For each firm in their sample, they use a financial planning model to estimate the rate of growth which can be financed internally or through short term financing alone. Then they

examine the firms that have growth rates exceeding their predicted rates. They show that the proportion of firms that grow faster than the predicted rate in each country is associated with the features of financial system and legal institutions. They state that high activity on stock market and high scores on an index of respect for legal norms are associated with faster than predicted growth rates. They also add that government subsidies do not affect the proportion of firms with faster than predicted growth rates.

Beck, Demirgüç-Kunt and Maksimovic (2003)<sup>5</sup> use the World Business Environment Survey to investigate how financial and institutional development affects financing of small and large firms. They find that small firms and firms in countries with poor institutions use less external finance, mainly bank finance. Since protection of property rights has a positive effect on bank finances, it increases the bank finance of small firms significantly more than large firms. They state that when faced with financial constraints, large firms expand their external financing more easily than small firms. Beck, Demirgüç-Kunt and Maksimovic (2005) examined the same subject with an updated database and reached similar conclusions. These results indicated that access to finance is a bigger obstacle for small firms when compared to large firms.

Beck, Demirgüç-Kunt, Laeven and Levine (2005) examine whether financial development has different effects on the growth of small and large firms. Theory suggests that well-developed financial systems have a greater effect on the growth of small firms than on the growth of large firms. The authors aim to investigate this phenomenon on a sectoral level. They find that financial development has a larger effect on the growth of the industries that are technologically more dependent on small firms. They suggest that financial development boosts growth due to the removal of constraints on small firms, and financial development also has sectoral implications.

Berger and Udell (2005) address the issue of SME finance by emphasizing lending technologies. They suggest that current categorization of lending technologies is flawed and insufficient since there are many different transaction technologies. They provide a detailed framework for lending technologies by proposing a causal chain from policy to financial structures. Authors argue that lending technologies play a key role as the channel through which government policies and financial structure affect SMEs'

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<sup>5</sup> The revised version of their paper is published in 2008, therefore it is listed as 2008 in the references section.

access to credit. They argue that oversimplification of this framework results in neglect of key elements such as opacity of the borrowers. The information problem in SME finance makes models treating lending technologies as a homogeneous group unsuitable.

Demirgüç-Kunt, Love and Maksimovic (2006) examine the effects of a country's institutions and business environment on firms' organizational decisions and the impact of organizational form of a firm on access to finance and growth. They use firm-level data of 52 countries. They find that in countries with developed financial sectors, efficient legal systems, low regulatory obstacles and efficient bankruptcy processes, businesses are more likely to choose the corporate form. They also find that incorporated firms have higher rates of growth in countries with mentioned specifications.

Beck and Demirgüç-Kunt (2006) investigate access to finance as a growth constraint on SMEs. They find evidence that small firms experience more severe growth constraints and have less access to external finance therefore it might be one of the reasons of lack of SME's contribution to growth. Development in financial institutions increases SMEs' access to finance. Beck, Demirgüç-Kunt and Maksimovic (2006) also examine the effect of financial and legal institutions on the size of the large firms. They find that firm size is positively related to financial intermediary development, efficiency of the legal system and property rights protection.

Beck, Demirgüç-Kunt, Laeven and Maksimovic (2006) use the Enterprise Survey to assess the determinants of financial obstacles on firms. They find that reporting of financial obstacles decrease with age, size and foreign ownership. Their results indicate that firm size, age and ownership status are important determinants of financial constraints and therefore firm growth. They also state that institutional development is a crucial characteristic in order to explain cross-country variation in firms' financing obstacles.

Aterido, Hallward-Driemeier and Pages (2009) use the Enterprise Survey to show the effects of business environment on employment growth by firms. They point out that these effects have differences across firm size. As previous studies state, small firms face higher financial obstacles. However they make the distinction between small and micro (less than 10 employees) firms, arguing that micro firms are less affected

form weak business environment. Furthermore, they find that small firms are the most constrained size group in terms of access to finance. They also address the potential problem of endogeneity, since a firm's growth performance and its financial variables can be endogenous. My paper will follow the methodology they use, which will be explained in detail in the fifth section.

There are also some studies that are not directly related to this subject, but provide important insight and methodological ideas for my research. Aghion and Howitt (2005) discuss theories of growth policy and their study contributes to the literature on growth models. Escribano, Guasch, Orte and Pena (2008) discuss econometric methodology of Turkey's Investment Climate Survey. Sleuwaegen and Goedhuys (1997) investigate growth of firms in developing countries by focusing on Ivory Coast. Beck, Demirgüç-Kunt and Levine (2005) use data from 45 countries in order to provide insight for the relationship regarding SMEs, economic growth and poverty. They find that SMEs and GDP per capita growth are positively associated, although they cannot support a causal link. They also find no evidence that SMEs alleviate poverty or decrease income inequality.

### **3. Data**

The World Bank's Enterprise Surveys provide firm level data on business environment from 135 countries.<sup>6</sup> The data has been collected through face-to-face interviews with top managers and business owners in over 130000 establishments worldwide. The survey in Turkey has been conducted between April 2008 and January 2009. It includes 1152 establishments and provides information on firm characteristics and the business environment. The sample of firms selected for survey is stratified by sector, size and location.

The selection of countries to compare with Turkey is not a simple task. Correa and Şeker use the same survey that is implemented in 28 other countries in the ECA region during the same time period. As a part of the cross-country comparison, I will be using ECA region data. However, some of the countries in ECA region such as Albania, Bosnia, Moldova do not possess the same characteristics as Turkey, mainly in terms of

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<sup>6</sup> The Enterprise Surveys can be accessed from [www.enterprisesurveys.org](http://www.enterprisesurveys.org)

GDP per capita. Including developed countries into the study would also create similar problems. The main objective of the process of country selection is that the overall level of development of a country should not create additional variance. It is not an aim of this study to capture results that are related to the characteristics of a country that are originated from its development level. Therefore, it is crucial to create a dataset that provides countries similar to Turkey. In order to achieve that, I selected countries from ECA, South America and Central American<sup>7</sup> regions that have higher GDP per capita than the UN upper middle income threshold as of 2007. The reasoning behind the selection of Latin American countries is that, it is often stated that Turkey and countries such as Brazil and Argentina have similar traits in terms of economical development and business environment. As a result, this study includes two datasets; one with 29 ECA countries and 11306 establishments, and the combined dataset with 15544 establishments from 25 countries that are listed in Table 1.

There are two major concerns caused by the inclusion of Latin American countries. First one is the difference in survey questions. Since surveys conducted in ECA region are not identical to the Latin America region, there is a loss of some variables in the process. However, those variables are tested within the ECA region data and also for Turkey, and they fail to have any significant effect on firm growth rates.<sup>8</sup> Furthermore, Correa and Şeker also report that these variables have no significant effect within Turkey. These variables can be treated as other variables that are dropped in the regression process.

The second problem is regarding the period that surveys are conducted. In most of the ECA region, this survey is conducted between 2008 and 2009. In Latin American countries, it was conducted between 2009 and 2010. Although I control this difference with year dummies, it is important to report this situation as a cautionary note. The effects of current global financial crisis did not occur simultaneously, or in the same magnitude, among these countries. Therefore, using this dataset, it is not possible to

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<sup>7</sup> I will be referring to South and Central American countries as Latin American countries for simplicity.

<sup>8</sup> I have tested close to 40 variables in the following categories: Finance, Infrastructure, Regulations and Training and others. The complete list of variables can be accessed through The Enterprise Surveys database.



investigate this subject completely clear of the effects of the crisis, even among countries with same surveying periods.

The classification of firms in terms of size is performed by dividing firms into four size groups in terms of full-time employment levels. Micro:  $\leq 10$ , Small: 11-50, Medium: 51-250 and Large:  $\geq 251$ . Employment levels are measured during the survey year and three years prior to the survey. Size groups are constructed using the employment levels from three years before the survey was conducted. Age groups are generated, according to the initial age of the firms, as follows: Young: 1-5, Mature: 6-15 and Old:  $\geq 16$ . As Table 2 shows, larger firms are likely to be older both in Turkey, ECA and in all countries combined.

Firm growth rates are calculated using the formula from Aterido, Hallward-Driemeier and Pages (2009) which is as follows:

$$growth = 2 \times \frac{(employment_t - employment_{t-3})}{(employment_t + employment_{t-3})}$$

(1)

This formula allows us to construct meaningful growth rates for firms with drastic changes in their employment levels; therefore outliers in terms of growth rates would be avoided.<sup>9</sup> The employment levels are from the survey year and three years before. Since the question in the survey is about the employment levels from three years before the survey, this study only includes firms that have existed three years before the survey and survived in the industry at least until the survey. Table 3 shows the relationship between age and size in terms of firm growth, for Turkey and for all data. Average growth rates decrease with size and age in both Turkey and all data. On average; Turkish firms display higher growth rates than the average growth rates of both data.

Along with size and age, there are some key variables that are used in the analysis. *Export* is a binary variable to control for firms that generate more than 10% of their sales from exports.<sup>10</sup> *Foreign* and *Govt* are also binary variables that control for the

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<sup>9</sup> This analysis is robust to the definition of growth, since other definitions are mostly linear combinations of this one.

<sup>10</sup> Using *Export* as a continuous variable yields no significant coefficients; therefore the binary form is preferred for this analysis.

ownership status of the firms; these variables are set equal to one when a firm is owned by foreigners and/or government by more than 10%, respectively. Firms that are completely owned by government are excluded from the analysis, since they might be subject to political influences. I also use dummy variables to control the effects of country, region within the country and sector.

#### 4. The Regression Analysis

Before introducing the models, it is important to state that in all of the regressions performed, probability weights have been used as suggested by the survey itself. Additionally, robust standard errors are constructed through clustering by region and 2-digit industry variables. I start the analysis by examining the relationship between firm size and firm growth. In the first model, instead of using size groups, logarithm of firm size (*logsize*) is used in order to analyze this relationship without any size assumptions. The model for Turkey is as follows:

$$growth_{i,t} = \beta_0 + \beta_1 Logsize_{i,t-3} + \beta_2 Age_{i,t-3} + \beta_3 Export_{i,t} + \beta_4 Foreign_{i,t} + \beta_5 Govt_{i,t} + \alpha Industry_i + \gamma Region_i + \epsilon_{i,t}$$

(2)

The following is the model for comparison between Turkey and other countries. *TR* is the dummy variable for Turkey.

$$g_{i,t} = \beta_0 + \beta_1 Logsize_{i,t-3} + \beta_2 Logsize_{i,t-3} \times TR_t + \beta_3 Age_{i,t-3} + \beta_4 Age_{i,t-3} \times TR_t + \beta_5 Export_{i,t} + \beta_6 Foreign_{i,t} + \beta_7 Govt_{i,t} + \alpha Industry_i + \gamma Region_i + \theta Country_i + \epsilon_{i,t}$$

(3)

The results are presented in Table 4. The regression within Turkey confirms the stylized facts that firm growth is negatively related with firm size and age. Coefficients of both *Logsize* and *Age* are negative and significant. Comparison with combined countries shows that the inverse relationship between firm growth and firm size is stronger in Turkey. The corresponding coefficient (*Logsize\*TR*) is negative and significant. Comparison with ECA region gives similar results. The relationship between firm growth and age in Turkey is not significantly different than other

countries. Coefficients of *Export*, *Foreign* and *Govt* are not significant in combined country data; however *Export* and *Foreign* have positive and significant coefficients in ECA region. Also it is important to note that in ECA region, the coefficient of *Turkey* dummy is positive and significant at 10% level, meaning that smaller firms in Turkey might be growing faster than smaller firms in ECA region. This coefficient was not significant in combined countries data.

In order to further analyze the relationship between firm size and firm growth, the following model with size groups is used. The omitted size group is micro firms.

$$g_{i,t} = \beta_0 + \beta_1 Small_{i,t-3} + \beta_2 Medium_{i,t-3} + \beta_3 Large_{i,t-3} + \beta_4 Age_{i,t-3} + \beta_5 Export_{i,t} + \beta_6 Foreign_{i,t} + \beta_7 Govt_{i,t} + \alpha Industry_i + \gamma Region_i + \theta Country_i + \epsilon_{i,t} \quad (4)$$

This model is used for cross-country comparison:

$$g_{i,t} = \beta_0 + \beta_1 Small_{i,t-3} + \beta_2 Medium_{i,t-3} + \beta_3 Large_{i,t-3} + \beta_4 Small_{i,t-3} \times TR_t + \beta_5 Medium_{i,t-3} \times TR_t + \beta_6 Large_{i,t-3} \times TR_t + \beta_7 Age_{i,t-3} + \beta_8 Age_{i,t-3} \times TR_t + \beta_9 Export_{i,t} + \beta_{10} Foreign_{i,t} + \beta_{11} Govt_{i,t} + \alpha Industry_i + \gamma Region_i + \theta Country_i + \epsilon_{i,t} \quad (5)$$

Results are given in Table 5. Regression within Turkey shows that micro firms are the fastest growing size group, as expected. However, the inverse relationship between growth rates and firm size is not monotonic. Coefficient of *Small* is the smallest and it is followed by *Medium*, implying that large firms are the second fastest growing size group. All three size groups' coefficients are significant, but tests for the difference of these coefficients show that there are no significant differences among them. Combined data also reveals non-monotonic growth pattern with respect to size. Coefficients of all size groups are significant and fastest growing group after micro firms are medium sized firms. Differences between the coefficients of small, medium and large size groups are not significant. On the other hand, ECA region shows monotonic growth pattern with respect to size. As usual, differences are not significant.

Regression with ECA region data and combined countries data give similar results about Turkey. Coefficient of *Large\*TR* is insignificant. Coefficients of *Small\*TR* and

*Medium\*TR* are negative and significant, whereas the coefficient of *Turkey* is positive and insignificant. In order to find the difference of growth rates between small (or medium) enterprises of Turkey and other countries, we need to add coefficient of *Small\*TR* (or *Medium\*TR*) with coefficient of *Turkey*. Both results are close to zero; they are tested and found insignificant. Therefore, there is no evidence that SMEs in Turkey have slower growth rates than ECA countries or other selected countries. Furthermore, coefficient of *Age\*TR* is also insignificant, meaning that the relationship between firm growth rates and firm age in Turkey is not significantly different than other countries.

Models presented with equations 4 and 5 are almost identical to the models in Correa and Şeker. Comparison between two studies shows that results presented in Table 5 are similar to their results. Since the definition of growth is different in this study, magnitudes of coefficients are expected to differ. Signs and ordering of significant coefficients are same in both studies.

In this part, I will analyze the relationship between employment growth rates and firm age within the size groups. In order to achieve that, following models will be used.

$$g_{i,t} = \beta_0 + \beta_1 Small_{i,t-3} + \beta_2 Medium_{i,t-3} + \beta_3 Large_{i,t-3} + \beta_4 Small_{i,t-3} \times Age_{i,t-3} + \beta_5 Medium_{i,t-3} \times Age_{i,t-3} + \beta_6 Large_{i,t-3} \times Age_{i,t-3} + \beta_7 Age_{i,t-3} + \beta_8 Export_{i,t} + \beta_9 Foreign_{i,t} + \beta_{10} Govt_{i,t} + \alpha Industry_i + \gamma Region_i + \epsilon_{i,t} \quad (6)$$

$$g_{i,t} = \beta_0 + \beta_1 Small_{i,t-3} + \beta_2 Medium_{i,t-3} + \beta_3 Large_{i,t-3} + \beta_4 [Small_{i,t-3} \times Age_{i,t-3}] + \beta_5 [Medium_{i,t-3} \times Age_{i,t-3}] + \beta_6 [Large_{i,t-3} \times Age_{i,t-3}] + \beta_7 Age_{i,t-3} + \beta_8 [Small_{i,t-3} \times TR_t] + \beta_9 [Medium_{i,t-3} \times TR_t] + \beta_{10} [Large_{i,t-3} \times TR_t] + \beta_{11} [Small_{i,t-3} \times Age_{i,t-3} \times TR_t] + \beta_{12} [Medium_{i,t-3} \times Age_{i,t-3} \times TR_t] + \beta_{13} [Large_{i,t-3} \times Age_{i,t-3} \times TR_t] + \beta_{14} [Age_{i,t-3} \times TR_t] + \beta_{15} Export_{i,t} + \beta_{16} Foreign_{i,t} + \beta_{17} Govt_{i,t} + \alpha Industry_i + \gamma Region_i + \theta Country_i + \epsilon_{i,t} \quad (7)$$

Equation 6 will provide insight for this relationship within Turkey, whereas equation 7 will help to analyze possible cross-country differences through the inclusion of all combinations of age and size variables with Turkey-specific country variable (*TR*). The results are presented in Table 6.

Regression within Turkey gives a negative and significant coefficient for *Age*, as expected. Since the coefficient of *Large\*Age* is insignificant, it is reasonable to assume that the relationship between firm age and firm growth is similar for micro and large firms. However, coefficients of *Small\*Age* and *Medium\*Age* are positive and significant. It implies that the negative effect of firm age on firm growth is smaller for small and medium enterprises in Turkey.

In the regression within ECA region, *Age* has a negative and significant coefficient. However, positive and significant coefficients of *Medium\*Age* and *Large\*Age* suggest that growth rates of medium and large firms are not negatively related with firm age. Regression also gives no significant coefficient regarding the relationship of firm age and growth rates that is specific to Turkey.

Combined countries data gives interesting results. There are no significant coefficients regarding *Size\*Age* variables. However, *Age\*TR* has a negative and significant coefficient whereas *Small\*Age\*TR* and *Medium\*Age\*TR* have positive and significant coefficients. It can be said that the negative relationship between firm age and growth rates is stronger for micro and large firms in Turkey than other selected countries. Small and medium firms in Turkey experience a relationship similar to other countries.

Overall, regression analyses show that there are only minimal differences in growth rates of small and medium enterprises between Turkey and other countries. However; in Turkey, growth rates of small and medium enterprises are significantly lower than the growth rates of micro firms, if the difference is compared to other countries. There are also some irregularities concerning the relationship between growth rates and firm age within size groups, in Turkey. In the next section, I will try to analyze the effects of financial and regulatory environment on these irregularities and growth rates of Turkish firms in general.

## **5. The Effects of Financial and Regulatory Environment**

The Enterprise Survey contains valuable information about the impact of financial and regulatory environment at the firm level. However, some variables are derived from answers to subjective questions, while some variables are country-specific and many

variables are not related with firm growth rates. Therefore, in order to find relevant variables, I used a series of regressions and also used some insight from previous studies.<sup>11</sup> As a result, there will be 4 financial and regulatory environment variables (*FVar*). Access to external finance (*Exfin*) measures the percentage of fixed assets financed by external funding. Line of credit (*Line*) is a binary variable that reports whether a firm has a line of credit or loan from a financial institution. Sale on credit (*Salescred*) gives the percentage of sales of a firm that was not paid before the delivery of the product. Management time (*Mgntime*) is the variable that measures what percentage of senior management time was spent in dealing with government regulations. Unfortunately all of these variables are measured in the survey year, or at the end of the fiscal year before the survey was undertaken. Since there are no variables that give information about 3 years before the survey, except employment levels which are used to compute the dependent variable, this situation presents an unavoidable problem for Enterprise Survey data.

Table 7 presents summary statistics for external financing. Average level of external financing for firms in Turkey is 26.23% which is lower than firms in combined countries but higher than firms in ECA region. Tables 8, 9 and 10 present growth rates of firms with respect to their level of external financing. Graphs indicate that firms with higher levels of external financing have higher growth rates.

Table 11 presents the number of firms having a line of credit. 63% of firms in Turkey have a line of credit. Proportion of firms that have a line of credit increases as firm size increases in all three datasets. In ECA region, only 48% of firms have a line of credit whereas in combined countries 60% of firms have a line of credit. Table 12 presents a comparison of average growth rates of firms with a line of credit to firms without a line of credit. It is clear that firms that have a line of credit have higher growth rates.

Summary statistics for sales on credit are presented in Table 13. Firms in Turkey sell 88% of their products on credit. This number is close to the average of combined countries but it is significantly higher than the average of ECA region which is 75%. Table 14 shows that sales on credit should be examined as an obstacle on growth of

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<sup>11</sup> Since the number of variables tested for this study is very large, I will only report variables that turned out to be significant.

Turkish firms, even though the slope of the basic regression is small. Tables 15 and 16 indicate that the inverse relationship between sales on credit and firm growth is not observed in other countries. This unique situation for Turkey encourages examining the effects of sales on credit. Since sales on credit is a form of negative financing for a firm, it can be an indicator of financial market imperfection and therefore an obstacle on firm growth.

Table 17 presents summary statistics for management time spent on regulations. Firms in Turkey spent almost twice the amount of time on regulations than ECA region or combined countries. For all three datasets, time spent on regulations increases as firm size increases. Tables 18, 19 and 20 suggest that this variable may not significantly affect firm growth. However, the disparity of average time spent on regulations between Turkey and the rest of the dataset provides necessary evidence to further analyze this variable.

Direct inclusion of these variables causes a major problem. Since the main data is cross sectional, there is a high possibility of endogeneity. Firms with high growth rates may be more likely to have external financing and line of credit. Faster growing firms might be spending more time interacting with government officials. Therefore, I will use two similar methods in order to alleviate this problem. For the sake of completeness, I will also use the variables directly, calling it method A.

The first method is the one that Şeker and Correa use in their paper. They create cells of firms that are in the same industry and region. They exclude cells with less than 5 observations, which accounts for a very small portion of firms. Then, they take averages for the relevant variables and use them in the regressions. I will use the same method and report it as method B. Although this method does not completely eliminate endogeneity, it uses averages of mostly large samples.

The second method will use smaller cells; mainly region-sector-size averages, which is the method from Aterido, Hallward-Driemeier, Pages (2009). A crucial feature of this method is that, it excludes the individual firms' own response from its own variable. Therefore, it handles endogeneity problem better than Şeker and Correa's method. They create cells based on both initial and average size of firms, and then they match firms according to their initial size. For cells smaller than 5 observations, they drop one aspect of the cells until they reach sufficient number of observations. I will use

this method to create cells based on average size of firms and matching with initial size of firms, this will be known as method C.

Method C creates additional problems while eliminating endogeneity. Firstly, it creates smaller cells that are vulnerable to small sample problems. The second problem is regarding the exclusion of the individual firms' own response from its own variable. Suppose this method is used with a binary variable such as *Line*. Data shows that firms with a line of credit ( $Line=1$ ) have a higher growth rate on average, than the firms with no line of credit ( $Line=0$ ). Consider two firms in a cell; Firm X with a line of credit and a higher growth rate, Firm Y without a line of credit and a slower growth rate. This method gives Firm X a strictly smaller *Line* variable than Firm Y. Since Firm X has a higher growth rate, the resulting coefficient for *Line* will be negative. Also, since the cells are smaller, almost all of the other variables of Firm X will be the same with Firm Y, which will amplify the effect of *Line*. As I will report in the following paragraphs, this method gives irrational results for the binary variable *Line*. This situation with binary variables should be a cautionary example for other variables as well. Use of this method may not always give accurate results, which is the main reason for using 3 different methods in this section.

Similar to the previous section, there will be two regression models, one for within Turkey and one for cross country comparison for Turkey. In the following models, I will use *Size* as a variable that contains *Small*, *Medium* and *Large*, for simplicity.

$$g_{i,t} = \beta_0 + \partial Size_{i,t-3} + \delta [Size_{i,t-3} \times F var_{i,t}] + \beta_1 F var_{i,t} + \beta_2 Age_{i,t-3} + \beta_3 Export_{i,t} + \beta_4 Foreign_{i,t} + \beta_5 Govt_{i,t} + \alpha Industry_i + \gamma Region_i + \epsilon_{i,t} \quad (8)$$

$$g_{i,t} = \beta_0 + \partial Size_{i,t-3} + \vartheta [Size_{i,t-3} \times TR_t] + \delta [Size_{i,t-3} \times F var_{i,t}] + \Omega [Size_{i,t-3} \times F var_{i,t} \times TR_t] + \beta_1 F var_{i,t} + \beta_2 [F var_{i,t} \times TR_t] + \beta_3 Age_{i,t-3} + \beta_4 [Age_{i,t-3} \times TR_t] + \beta_5 Export_{i,t} + \beta_6 Foreign_{i,t} + \beta_7 Govt_{i,t} + \alpha Industry_i + \gamma Region_i + \theta Country_i + \epsilon_{i,t} \quad (9)$$

### 5.1. External Financing

Results for the variable *Exfin* are given in Table 21. Regressions within Turkey with methods A and B suggest that external financing does not significantly affect firm



growth. However, using method Y gives *Exfin* a positive coefficient that is significant in 10% level. Also *Large\*Exfin* has a negative coefficient with 5% significance level. Therefore; method Y suggests that external financing provides an overall increase in firm growth except for large firms. It is also important to note that using methods B and C results in losing significance in other variables such as *Small*, *Medium* and *Large*.

Coefficient of *Exfin* is positive and highly significant in both datasets with all three methods. Considering methods B and C, one percent increase in a firm's external financing increases its growth around 0.007% in combined countries. In ECA region, this effect is smaller; 0.0024% with method B and 0.0046% with method C. It is reasonable to conclude that, overall, external financing has a positive effect on firm growth. In the combined countries data, we can observe that the positive effect of external financing diminishes with size, suggesting medium enterprises are the least affected group. However the differences between medium and small, and medium and large are not significant. Using external financing in cross country comparison does not yield much information regarding the specific case of Turkey. In all regressions, the coefficient of *Exfin\*TR* is insignificant. In combined data with method B, the coefficient of *Medium\*Exfin\*TR* is positive and significant at 10% level. In ECA data with method C, the coefficient of *Large\*Exfin\*TR* is negative and significant. There are no other significant coefficients that are related to Turkish firms alone. Therefore, it can be concluded that external financing does not create a difference for Turkey in terms of firm growth rates.

## **5.2. Line Of Credit**

Line of credit is a binary variable, but methods B and C use cell averages. Therefore this variable is no longer a binary variable for these methods; it can be interpreted as the probability of having a line of credit. Methods B and C result in inflated coefficients for this variable, since they change its characteristics. As mentioned in the previous section, method C is especially problematic for this variable. It is important to interpret the results with caution. The results are presented in Table 22.

In Turkey, method A suggests that only small firms are positively and significantly affected by having a line of credit. Methods B and C show that an increase in the probability of having a line of credit significantly increases overall firm growth. However, as size of the firm increases, this positive effect decreases and becomes a

negative effect for large firms. Therefore, micro firms benefit from having a line of credit the most.

Both in the combined countries data and ECA data, all methods show that the coefficient of *Line* is positive and significant; having a line of credit is positively associated with firm growth. Methods B and C suggest that small firms in combined data experience a smaller effect. This effect is not observed in ECA data. Method A reveals that small firms in Turkey benefit from having a line of credit significantly more than other firms in both combined and ECA data. Regressions in combined and ECA data with methods B and C give similar results. They show that Turkish firms overall have a positive and significant coefficient, whereas small firms in Turkey have a negative and significant coefficient. Method C also gives a negative and significant coefficient for large firms in Turkey. The common result for these regressions is that; all firms benefit from having a line of credit overall, but this effect decreases with size for Turkish firms. Inflated coefficients and possibility of endogeneity prevents making further interpretation for this variable.

### **5.3. Sale On Credit**

Sale on credit (*Sales*) gives the percentage of firms' sales for which firms did not receive immediate payment on delivery. This variable is the least problematic variable in terms of endogeneity, since a firm's employment growth should not affect the structure of payments the firm receives. Results are presented in Table 23.

All three methods give insignificant coefficients for the regression within Turkey. Combined data includes only two significant coefficients; Method B shows that large firms in Turkey are negatively affected with the increase of sale on credit, Method C yields a negative coefficient for sale on credit overall. Both of these coefficients are significant only at 10% level; therefore it is reasonable to conclude that sale on credit does not significantly affect firm growth neither in Turkey nor in combined countries.

The analysis performed on ECA data gives similar results, except for an interesting situation for medium sized firms. All three methods show that sale on credit is positively related with employment growth of medium sized enterprises. Method C gives a negative and significant coefficient for *Sales* overall.

Main conclusions for analysis on this variable are that, sale on credit does not create a significant effect on firm growth in general, and it also does not create a difference for Turkish firms as well.

#### **5.4. Management Time Spent on Regulations**

Management Time (*Mngtime*) measures what percentage of senior management time was spent on dealing with government regulations. Since firms with high employment growth can spend more time on government regulations, this variable is also vulnerable to endogeneity problem. Nevertheless, the results are provided in Table 24. In Turkey, Method A suggests small firms which spend more time on government regulations grow faster. Methods B and C suggest that employment growth of large firms is negatively affected by the amount of time spent on government regulations. Small firms can be spending time on regulations in order to grow, whereas regulations can be an obstacle for large firms.<sup>12</sup>

Cross country comparison yields similar results for Turkish firms. Method A gives a positive and significant coefficient for *Small\*Mngtime\*TR*, whereas Method B gives a negative and significant coefficient for *Large\*Mngtime\*TR* for both datasets (Method C gives similar results for ECA countries). For combined dataset, Method A suggests growth of Turkish firms and growth of medium sized firms overall are negatively related with management time, although medium sized firms in Turkey are exempt from this size effect. Method C gives a positive coefficient for overall term *Mngtime* but negative coefficients of small and large firm cross terms negate this effect.

Overall, this analysis indicates that small firms in Turkey might experience a boost from spending management time on government regulations, which is significantly different from other countries. In the same manner, large firms in Turkey might consider it an obstacle that is significantly more severe than firms in other countries might consider.

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<sup>12</sup> Aterido, Hallward-Driemeier, Pages (2009) also report a similar (and perhaps stronger) result. They find a positive coefficient for micro firms and negative coefficients for other size groups. All of their coefficients are significant.

## 6. The Effects of Age with Financial and Regulatory Environment

In the previous section, the analysis focused on the effects of financial and regulatory environment within size groups. This section will analyze whether firm age has a significant role in this relationship. The following are models for Turkey and cross country comparison:

$$g_{i,t} = \beta_0 + \partial Size_{i,t-3} + \delta [Size_{i,t-3} \times Fvar_{i,t}] + \Omega [Size_{i,t-3} \times Age_{i,t-3}] + \Upsilon [Size_{i,t-3} \times Fvar_{i,t} \times Age_{i,t-3}] + \beta_1 Fvar_{i,t} + \beta_2 Age_{i,t-3} + \beta_3 [Fvar_{i,t} \times Age_{i,t-3}] + \beta_4 Export_{i,t} + \beta_5 Foreign_{i,t} + \beta_6 Govt_{i,t} + \alpha Industry_i + \gamma Region_i + \epsilon_{i,t} \quad (10)$$

$$g_{i,t} = \beta_0 + \partial Size_{i,t-3} + \delta [Size_{i,t-3} \times Fvar_{i,t}] + \Omega [Size_{i,t-3} \times Age_{i,t-3}] + \Upsilon [Size_{i,t-3} \times Fvar_{i,t} \times Age_{i,t-3}] + \tilde{\lambda} [Fvar_{i,t} \times Age_{i,t-3}] + \ell [Size_{i,t-3} \times Age_{i,t-3} \times TR_t] + \Delta [Size_{i,t-3} \times Fvar_{i,t} \times Age_{i,t-3} \times TR_t] + \nabla [Size_{i,t-3} \times TR_t] + \varpi [Size_{i,t-3} \times Fvar_{i,t} \times TR_t] + \beta_1 Fvar_{i,t} + \beta_2 [Fvar_{i,t} \times TR_t] + \beta_3 [Fvar_{i,t} \times Age_{i,t-3} \times TR_t] + \beta_4 Age_{i,t-3} + \beta_5 [Age_{i,t-3} \times TR_t] + \beta_6 Export_{i,t} + \beta_7 Foreign_{i,t} + \beta_8 Govt_{i,t} + \alpha Industry_i + \gamma Region_i + \theta Country_i + \epsilon_{i,t} \quad (11)$$

The purpose of this analysis is to examine the function of age together with financial and regulatory environment. My focus will be solely on interaction terms that include  $Age * Fvar$ . Therefore, these long equations ensure that those coefficients are cleaned from the general effects of age, age with size, and Turkey specific general age effects.

### 6.1. External Financing

Table 25 presents the results. Within Turkey, only Method A gives significant coefficients. It suggests that for micro firms in Turkey; as age increases, external financing will have less effect on firm growth. For small, medium and large firms, this effect approaches to zero.

For ECA and combined data, only Method A gives significant coefficients for Turkish firms, which are in line with the previous paragraph. Methods B and C do not

give meaningful significant coefficients; therefore endogeneity might be an explanation for these results. Overall, reported individual variables suggest that for micro firms in Turkey, older firms are less likely to be constrained by lack of access to external finance.

## **6.2. Line Of Credit**

Results are presented in Table 26. For Turkey, Method B suggests that effects of having a line of credit decreases with firm age. Method C gives a positive and significant coefficient for large firms, but as mentioned in previous sections, Method C is problematic to use on line of credit variable. There are no other significant variables in the regression on Turkey.

Method A does not report any significant coefficient for cross country comparison. Method C suggests that for Turkish firms (especially for micro firms), as the firm age increases, the positive effect of having a line of credit diminishes. Large Turkish firms however, experience a positive effect from this relationship. In combined data, small and medium firms in Turkey have positive and significant coefficients that negate the overall negative effect in Turkey. Overall, Turkish firms consider having a line of credit as less constraining as they get older and bigger, whereas micro firms find line of credit more constraining as they get older.

## **6.3. Sales On Credit**

Table 27 presents the results for sales on credit. Method A indicates that within Turkey, as firm age increases, sales on credit will have a more positive effect on firm growth, except for medium sized firms. Method B suggests that only large firms in Turkey experience this positive effect. Cross country analysis gives the exact same result for Turkey. Method C does not yield any significant coefficient. In the previous section, it was concluded that sales on credit does not have any significant effect on growth rates of Turkish firms overall, this results suggest that it might only be less of a constraint for older firms, therefore its overall effects become close to zero.

## **6.4. Management Time Spent on Regulations**

Results in Table 28 show that Method A yields no significant coefficient, neither within Turkey, or in cross country comparison for Turkey. Method C suggests that for

firms in Turkey,  $Mngtime*Age$  has a negative and significant effect. This effect becomes positive as firm size increases. This effect is also significant in international level. Method B also suggests that compared to combined countries, medium and large Turkish firms are positively affected by  $Mngtime$  as they grow older.

In the previous section, it is stated that for Turkey, smaller firms are positively affected by time spent on government regulations whereas large firms are negatively affected, with respect to the firms in other countries. This analysis shows that both of those effects diminish as firm age increases.

## 7. Conclusion

This paper analyses patterns of employment growth for firms, with a specific focus on Turkey. The role of firm size and age on firm growth is investigated on international level, using firm level data. The results for Turkey indicate that growth rates decrease in firm size and age, as the theory suggests. However, consistent with the empirical literature, growth rates decrease in a non-monotonic way with respect to size. For cross country analysis, two datasets were created; one consists of all ECA region countries whereas another one includes countries from ECA, Central and South America regions. Selection of those countries is based on their similarity to the economic characteristics and performance to Turkey. Both datasets show that growth rates decrease with size and age. In ECA region, this relationship between growth rates and size groups is monotonic. I find no evidence that Turkish firms grow significantly faster or slower than firms in other countries in either dataset. The non-monotonicity of growth rates with respect to firm size in countries similar to Turkey might suggest that; small and medium enterprises experience a slower-than-expected growth performance.

In order to provide a more detailed analysis, the effect of age on firm growth is investigated within size groups. Within Turkey, the negative effect of firm age on growth is greater for micro and large firms. This outcome for micro and large firms in Turkey is also significant when compared to selected countries. However, when compared to ECA region, the effect of firm age on growth within size groups for Turkish firms is not significantly different.

The effects of financial and regulatory environment on firm growth are analyzed, including their interaction with firm size and age. In order to account for endogeneity, three different methods are used in these analyses. Results indicate that external financing and the percentage of sales on credit does not create a significant effect on the growth rates of Turkish firms, hence they do not act as significant constraints on growth. There is also no evidence that these variables create a difference on international level. An increase in the probability of having a line of credit increases firm growth in general. For Turkish firms; as firm size increase, this positive effect decreases. Except for micro firms, this effect increases as firm age increases. Management time spent on government regulations has a positive effect for small Turkish firms. This effect is negative for large Turkish firms. Further analysis indicates that both effects diminish as firm age increases.

Access to external finance is often considered as a major obstacle on growth for SMEs in Turkey. One of the main findings of this paper is that; compared to similar countries, access to finance does not create a significant difference in growth rates for Turkey. Results on international level indicate that external financing is an important factor on firm growth, and Turkey is not different from countries with similar characteristics.

Enterprise Surveys provides valuable firm level information for almost every country. Many studies have been performed using this rich database; many more will follow as the surveys continue to grow. Although this study does not offer any significant policy implications for Turkey, it can be an important step for future studies with wider datasets and more detailed variables. This paper also provides a better understanding for the effects of firm size and age on employment growth.

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## Appendix

**Table 1: List of Countries Included in the Analysis**

Country	ECA Region		Combined Data	
	Number of Observations	Percent of Total	Number of Observations	Percent of Total
Albania	175	1,55		
Belarus	273	2,41	273	1,76
Georgia	373	3,30		
Tajikistan	360	3,18		
Turkey	1152	10,19	1152	7,41
Ukraine	851	7,53		
Uzbekistan	366	3,24		
Russia	1004	8,88	1004	6,46
Poland	455	4,02	455	2,93
Romania	541	4,79	541	3,48
Serbia	388	3,43	388	2,50
Kazakhstan	544	4,81	544	3,50
Moldova	363	3,21		
Bosnia and Herzegovina	361	3,19		
Azerbaijan	380	3,36		
Fyr Macedonia	366	3,24		
Armenia	374	3,31		
Kyrgyz Republic	235	2,08		
Estonia	273	2,41	273	1,76
Kosovo	270	2,39		
Czech Republic	250	2,21	250	1,61
Hungary	291	2,57	291	1,87
Latvia	271	2,40	271	1,74
Lithuania	276	2,44	276	1,78
Slovak Republic	275	2,43	275	1,77
Slovenia	276	2,44	276	1,78
Bulgaria	288	2,55	288	1,85
Croatia	159	1,41	633	4,07
Montenegro	116	1,03	116	0,75
Argentina			1054	6,78
Brazil			1802	11,59
Chile			1033	6,65
Colombia			942	6,06
Mexico			1480	9,52
Peru			1000	6,43
Uruguay			607	3,91
Venezuela			320	2,06
<b>Total</b>	<b>11306</b>	<b>100</b>	<b>15544</b>	<b>100</b>

**Table 2: Number of Firms at Different Size and Age Groups**

## TURKEY

Age	Micro	Small	Medium	Large	Total
Young	52	74	20	5	151
Mature	72	196	92	35	395
Older	45	137	123	59	364
Total	169	407	235	99	910

## COMBINED COUNTRIES

Age	Micro	Small	Medium	Large	Total
Young	818	995	461	107	2381
Mature	1392	2857	1459	442	6150
Older	719	2100	1709	935	5463
Total	2929	5952	3629	1484	13994

## ECA REGION

Age	Micro	Small	Medium	Large	Total
Young	948	996	422	95	2461
Mature	1296	2471	1329	359	5455
Older	198	558	633	358	1747
Total	2442	4025	2384	812	9663

**Table 3: Growth Rates of Firms at Different Size and Age Groups****TURKEY**

Age	Micro	Small	Medium	Large	Total
Young	0,644	0,348	0,377	0,189	0,449
Mature	0,348	0,186	0,113	0,158	0,196
Older	0,259	0,074	0,083	0,058	0,079
Total	0,415	0,178	0,120	0,031	0,191

**COMBINED COUNTRIES**

Age	Micro	Small	Medium	Large	Total
Young	0,412	0,208	0,118	-0,036	0,250
Mature	0,248	0,114	0,071	0,047	0,129
Older	0,258	0,023	0,026	-0,022	0,047
Total	0,296	0,097	0,056	-0,003	0,118

**ECA REGION**

Age	Micro	Small	Medium	Large	Total
Young	0,430	0,225	0,123	0,054	0,280
Mature	0,219	0,109	0,059	0,011	0,116
Older	0,215	0,040	-0,036	-0,128	-0,002
Total	0,301	0,128	0,045	-0,045	0,137

**Table 4: Regression of Employment Growth Rates with Logarithm of Firm Size**

VARIABLES	Turkey	Combined Countries	ECA Region
Logsize		-0.0526 (0.015)***	-0.0758 (0.008)***
Logsize*TR	-0.1106 (0.017)***	-0.0759 (0.021)***	-0.0585 (0.022)***
Age		-0.0030 (0.001)***	-0.0025 (0.001)***
Age*TR	-0.0052 (0.003)*	-0.0027 (0.003)	-0.0027 (0.003)
Export	0.0352 (0.076)	-0.0016 (0.032)	0.0748 (0.022)***
Foreign	-0.1046 (0.144)	0.0113 (0.060)	0.0819 (0.047)*
Govern	0.1543 (0.117)	0.0523 (0.068)	0.0535 (0.057)
Turkey			0.4686 (0.250)*
Constant	0.7516 (0.110)***	0.6275 (0.105)***	0.3400 (0.105)***
Observations	910	13977	9530
R-squared	0.172	0.145	0.139

Robust standard errors clustered by region and 2-digit industry are in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 5: Regression of Employment Growth Rates with Size Groups**

VARIABLES	Turkey	Combined Countries	ECA Region
Small*TR	-0.3803 (0.057)***	-0.1700 (0.073)**	-0.2427 (0.069)***
Medium*TR	-0.3574 (0.086)***	-0.2182 (0.100)**	-0.2301 (0.086)***
Large*TR	-0.3135 (0.126)**	-0.1422 (0.119)	-0.1512 (0.129)
Small		-0.2495 (0.042)***	-0.1638 (0.019)***
Medium		-0.2097 (0.048)***	-0.2033 (0.027)***
Large		-0.2158 (0.055)***	-0.2316 (0.035)***
Age		-0.0036 (0.001)***	-0.0034 (0.001)***
Age*TR	-0.0051 (0.003)*	-0.0019 (0.003)	-0.0016 (0.003)
Export	0.0133 (0.065)	-0.0028 (0.031)	0.0603 (0.022)***
Foreign	-0.2392 (0.167)	-0.0344 (0.065)	0.0580 (0.046)
Govern	0.3428 (0.146)**	0.0253 (0.065)	0.0179 (0.055)
Turkey		0.1635 (0.217)	0.2079 (0.150)
Constant	0.7954 (0.162)***	0.6429 (0.115)***	0.6248 (0.236)***
Observations	910	13992	9533
R-squared	0.231	0.162	0.139

Robust standard errors clustered by region and 2-digit industry are in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 6: Effects of Firm Size with Age on Growth**

VARIABLES	Turkey	Combined Countries	ECA Region
Small*Age*TR	0.0091 (0.005)*	0.0154 (0.006)**	0.0079 (0.006)
Medium*Age*TR	0.0164 (0.005)***	0.0208 (0.006)***	0.0087 (0.006)
Large*Age*TR	-0.0013 (0.008)	-0.0041 (0.009)	-0.0127 (0.009)
Small*TR	-0.4869 (0.104)***	-0.3577 (0.118)***	-0.3549 (0.122)***
Medium*TR	-0.6106 (0.118)***	-0.5368 (0.147)***	-0.3995 (0.138)***
Large*TR	-0.2459 (0.197)	0.0498 (0.203)	0.1138 (0.211)
Age*TR	-0.0123 (0.005)**	-0.0124 (0.005)**	-0.0041 (0.005)
Turkey		0.3050 (0.225)	0.2837 (0.160)*
Age		-0.0019 (0.003)	-0.0087 (0.003)***
Small*Age		-0.0036 (0.003)	0.0028 (0.003)
Medium*Age		-0.0027 (0.003)	0.0074 (0.003)**
Large*Age		0.0021 (0.003)	0.0089 (0.004)**
Small		-0.2051 (0.042)***	-0.1818 (0.038)***
Medium		-0.1722 (0.064)***	-0.2842 (0.040)***
Large		-0.3236 (0.072)***	-0.3862 (0.068)***
Export	0.0063 (0.071)	-0.0070 (0.033)	0.0583 (0.022)***
Foreign	-0.1754 (0.135)	-0.0306 (0.066)	0.0599 (0.046)
Govern	0.2911 (0.130)**	0.0259 (0.061)	0.0128 (0.053)
Constant	0.6866 (0.143)***	0.6064 (0.102)***	0.6231 (0.236)***
Observations	910	13992	9533
R-squared	0.219	0.168	0.148

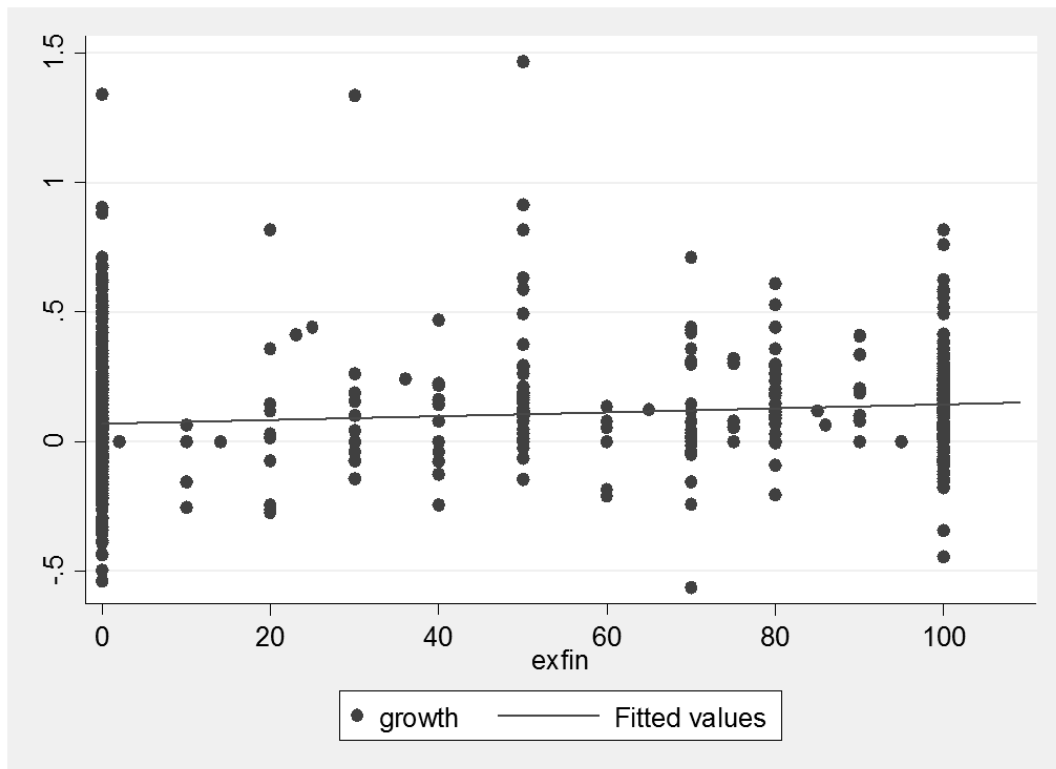
Robust standard errors clustered by region and 2-digit industry are in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1



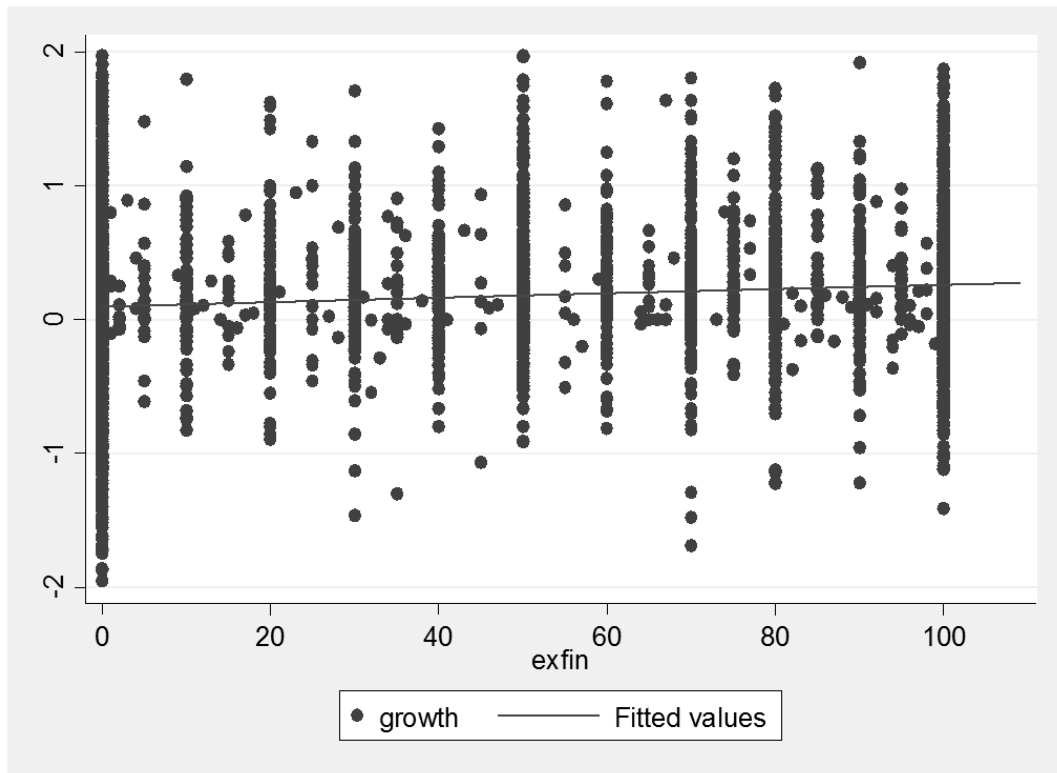
**Table 7: Summary Statistics for External Financing**

External Financing	Obs	Mean	Std. Dev.	Min	Max
Turkey	901	26,23	39,85	0	100
ECA	9563	23,89	37,80	0	100
Combined Countries	13853	28,50	40,26	0	100

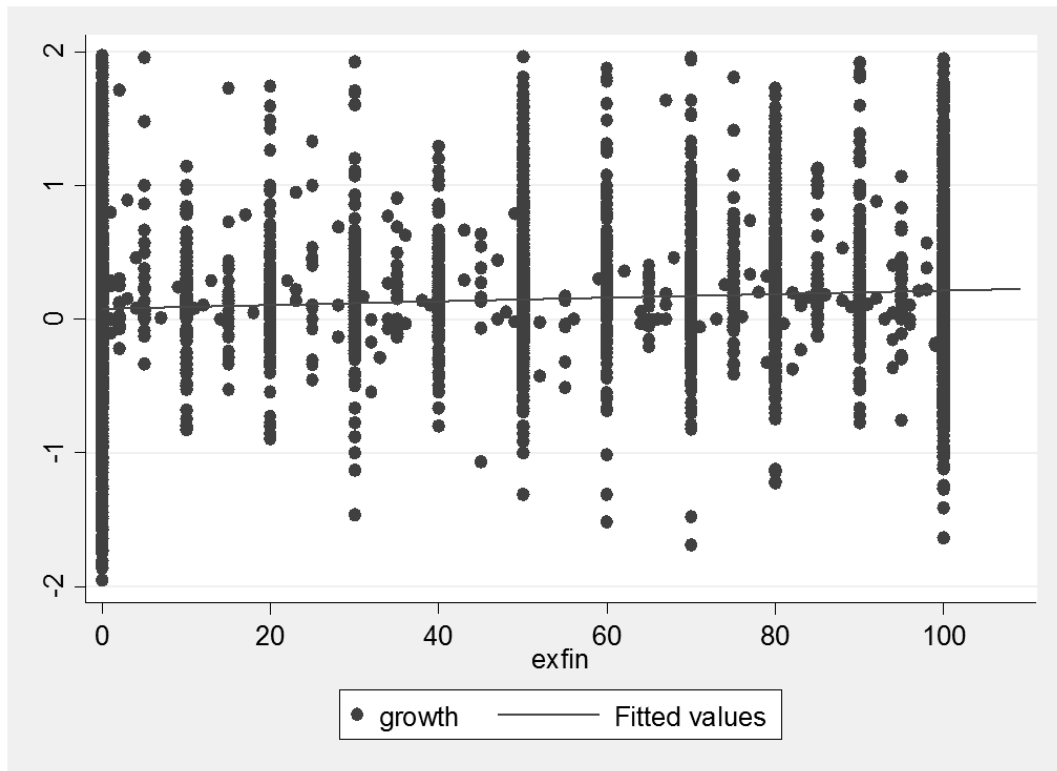
**Table 8: Growth Rates of Firms in Turkey and Level of External Financing**



**Table 9: Growth Rates of Firms in ECA Region and Level of External Financing**



**Table 10: Growth Rates of Firms in Combined Countries and Level of External Financing**



**Table 11: Number of Firms Having a Line of Credit**

**Turkey**

<b>Size</b>	<b>No</b>	<b>Yes</b>	<b>Total</b>
<b>Micro</b>	77	93	170
<b>Small</b>	150	260	410
<b>Medium</b>	77	158	235
<b>Large</b>	30	72	102
<b>Total</b>	334	583	917

**ECA**

<b>Size</b>	<b>No</b>	<b>Yes</b>	<b>Total</b>
<b>Micro</b>	1556	886	2442
<b>Small</b>	2178	1847	4025
<b>Medium</b>	1011	1373	2384
<b>Large</b>	263	549	812
<b>Total</b>	5008	4655	9663

**Combined Countries**

<b>Size</b>	<b>No</b>	<b>Yes</b>	<b>Total</b>
<b>Micro</b>	1608	1321	2929
<b>Small</b>	2439	3513	5952
<b>Medium</b>	1144	2485	3629
<b>Large</b>	340	1144	1484
<b>Total</b>	5531	8463	13994

**Table 12: Growth Rates of Firms with a Line of Credit**

**Turkey**

<b>Size</b>	<b>No</b>	<b>Yes</b>	<b>Total</b>
<b>Micro</b>	0,15525	0,20690	0,18351
<b>Small</b>	0,03750	0,10622	0,08108
<b>Medium</b>	0,03821	0,06874	0,05874
<b>Large</b>	0,00614	0,03590	0,02715
<b>Total</b>	0,06199	0,10344	0,08834

**ECA**

<b>Size</b>	<b>No</b>	<b>Yes</b>	<b>Total</b>
<b>Micro</b>	0,24338	0,40109	0,30060
<b>Small</b>	0,05693	0,21208	0,12813
<b>Medium</b>	-0,02797	0,09872	0,04499
<b>Large</b>	-0,12111	-0,00852	-0,04499
<b>Total</b>	0,08837	0,18860	0,13666

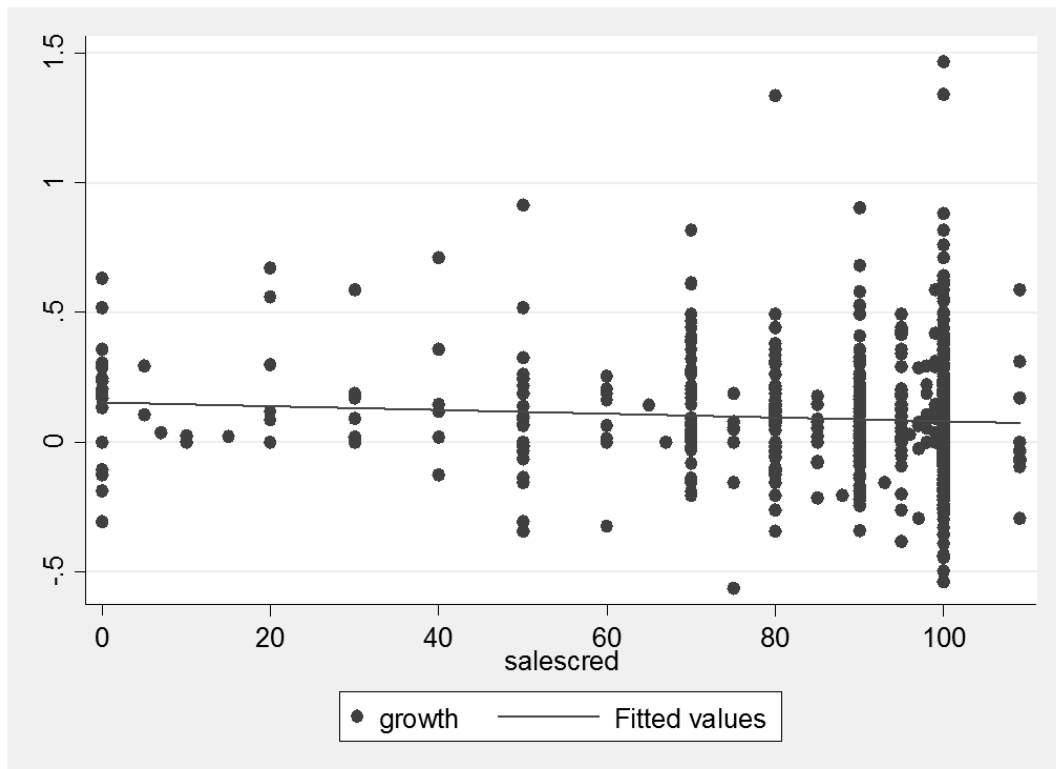
**Combined Countries**

<b>Size</b>	<b>No</b>	<b>Yes</b>	<b>Total</b>
<b>Micro</b>	0,21957	0,38993	0,29640
<b>Small</b>	0,03718	0,13923	0,09741
<b>Medium</b>	0,00603	0,07846	0,05563
<b>Large</b>	-0,06849	0,01672	-0,00280
<b>Total</b>	0,07726	0,14396	0,11760

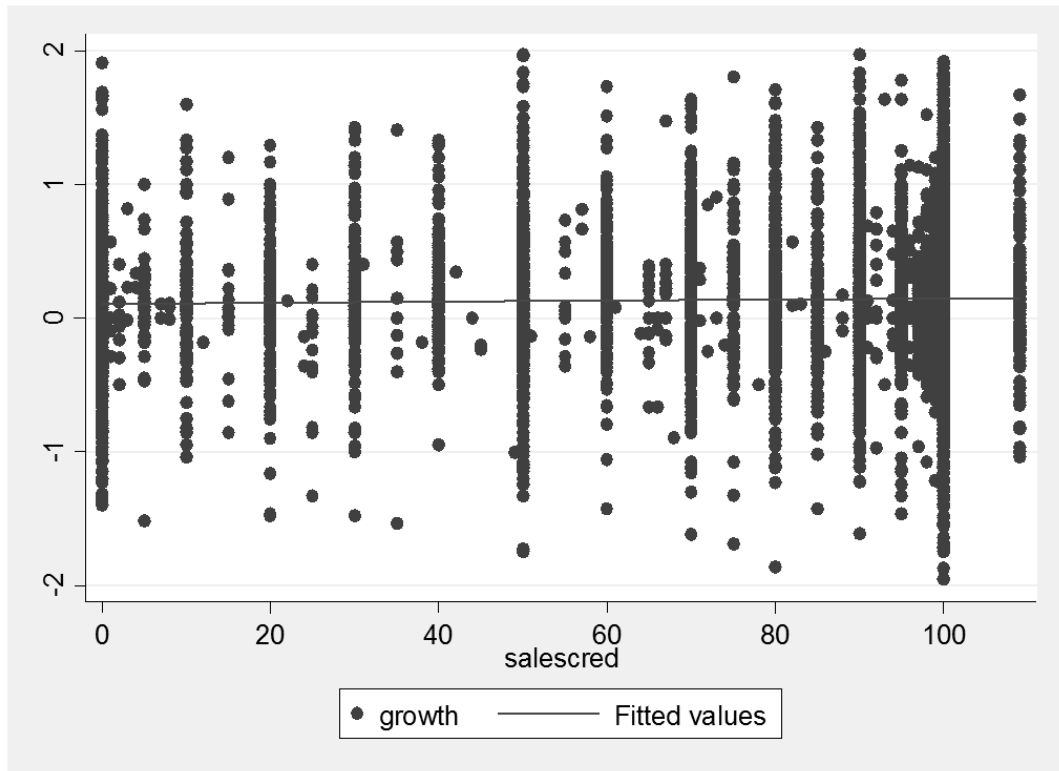
**Table 13: Summary Statistics for Sales on Credit**

Sales on Credit	Obs	Mean	Std. Dev.	Min	Max
Turkey	899	88,55	21,24	0	100
ECA	9448	75,59	33,04	0	100
Combined Countries	13812	87,63	23,67	0	100

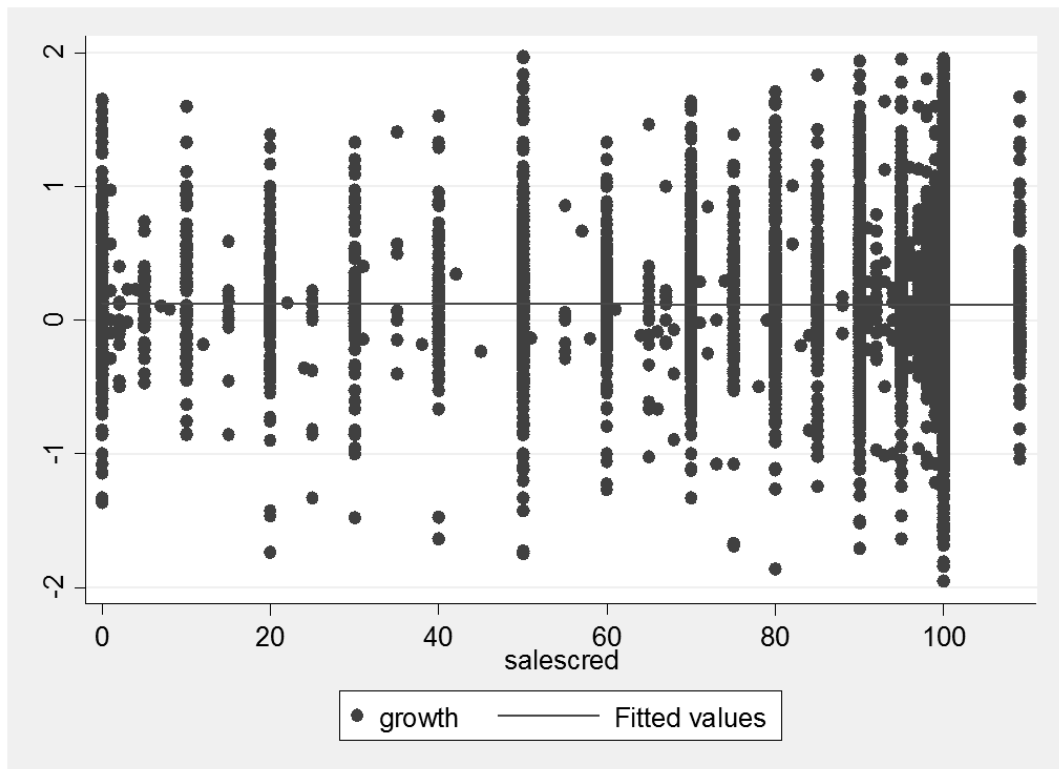
**Table 14: Growth Rates of Firms in Turkey and Sales on Credit Level**



**Table 15: Growth Rates of Firms in ECA Region and Sales on Credit Level**



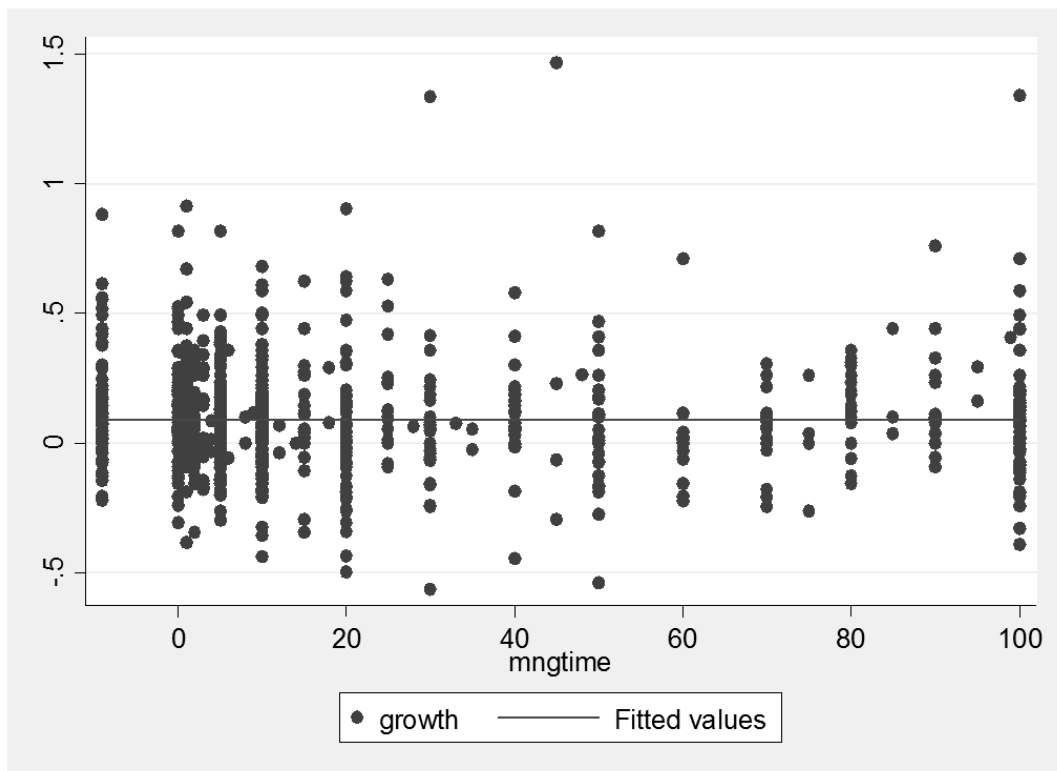
**Table 16: Growth Rates of Firms in Combined Countries and Sales on Credit Level**



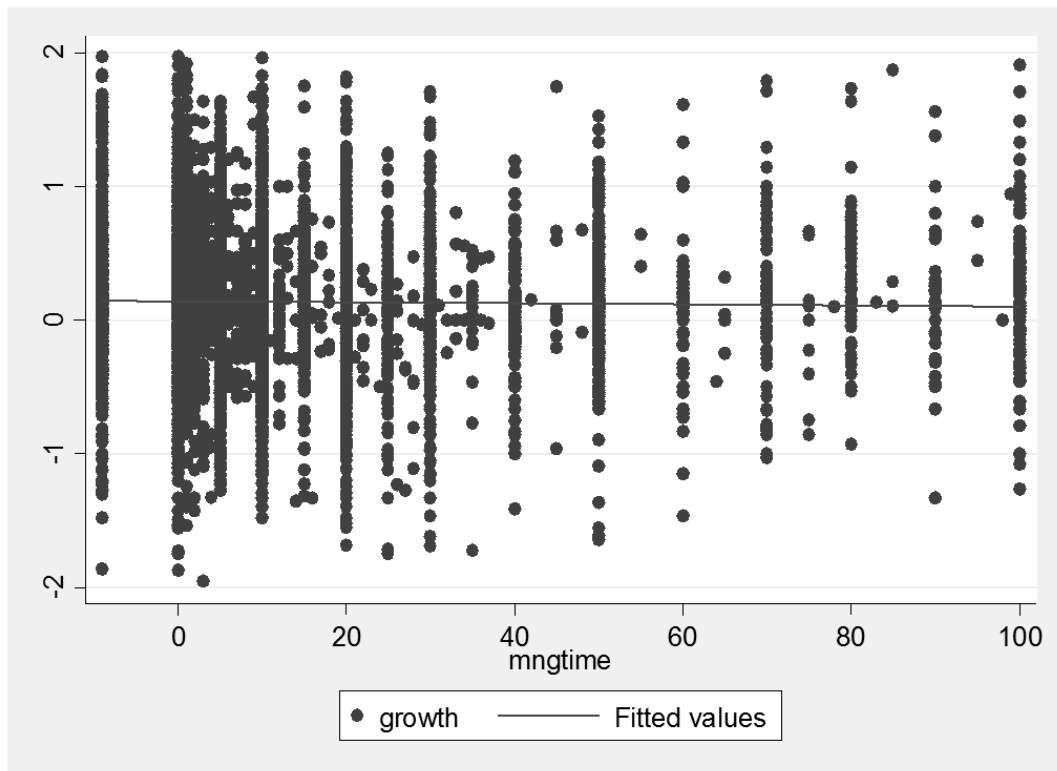
**Table 17: Summary Statistics for Management Time Spent on Regulations**

Management Time	Obs	Mean	Std. Dev.	Min	Max
Turkey	917	25,10	33,52	0	100
ECA	9663	11,63	20,67	0	100
Combined Countries	13994	14,64	20,48	0	100

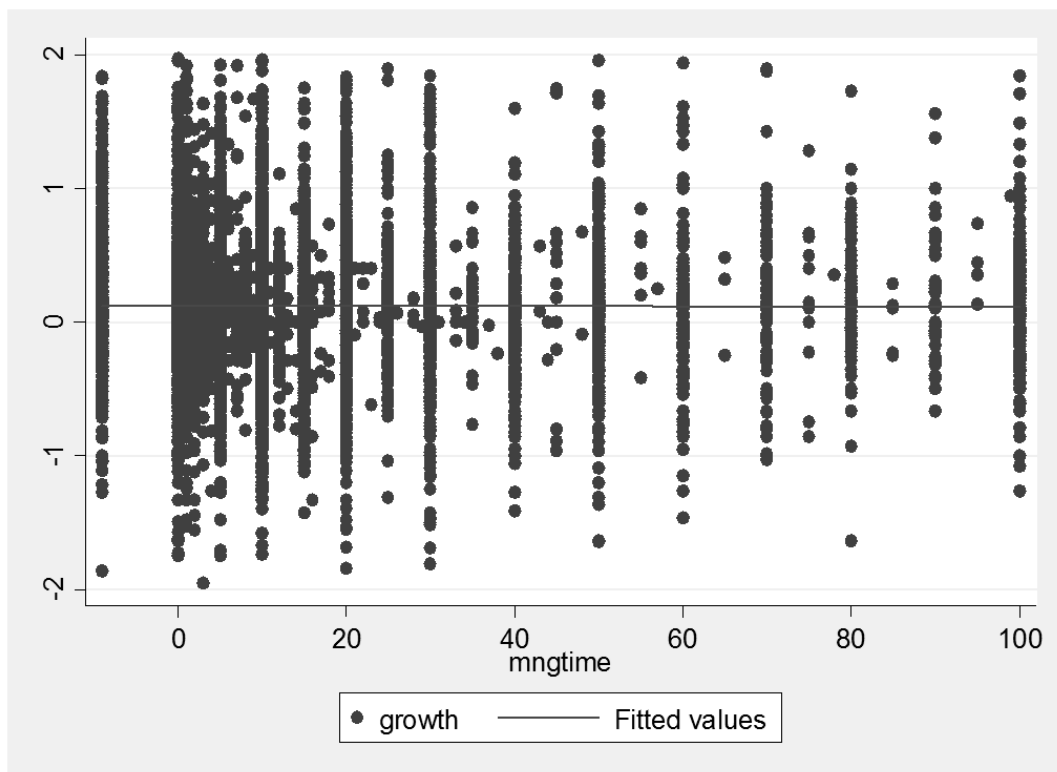
**Table 18: Growth Rates of Firms in Turkey and Management Time Spent on Regulations**



**Table 19: Growth Rates of Firms in ECA Region and Management Time Spent on Regulations**



**Table 20: Growth Rates of Firms in Combined Countries and Management Time Spent on Regulations**





**Table 21: Effects of External Financing on Firm Growth**

VARIABLES	Turkey			Combined Countries			ECA Region		
	Method A	Method B	Method C	Method A	Method B	Method C	Method A	Method B	Method C
small*TR	-0.4162 (0.071)***	-0.3364 (0.194)*	-0.1780 (0.156)	-0.1992 (0.105)*	-0.1066 (0.190)	-0.1578 (0.150)	-0.2744 (0.092)***	-0.2573 (0.195)	-0.0649 (0.160)
medium*TR	-0.4361 (0.115)***	-0.5297 (0.280)*	-0.3451 (0.225)	-0.2587 (0.140)*	-0.7907 (0.352)**	-0.4612 (0.234)**	-0.2863 (0.121)**	-0.5132 (0.267)*	-0.2147 (0.190)
large*TR	-0.3416 (0.130)**	-0.5159 (0.312)	0.1244 (0.279)	-0.2333 (0.111)**	-0.4901 (0.394)	-0.0560 (0.280)	-0.1785 (0.112)	-0.2485 (0.371)	0.4349 (0.311)
small*Exfin*TR	0.0015 (0.003)	-0.0023 (0.006)	-0.0082 (0.006)	0.0016 (0.003)	-0.0025 (0.005)	0.0008 (0.006)	0.0015 (0.003)	0.0005 (0.007)	-0.0067 (0.006)
medium*Exfin*TR	0.0022 (0.003)	0.0044 (0.008)	-0.0024 (0.007)	0.0010 (0.003)	0.0195 (0.010)*	0.0093 (0.007)	0.0014 (0.003)	0.0095 (0.008)	-0.0006 (0.006)
large*Exfin*TR	-0.0002 (0.002)	0.0057 (0.012)	-0.0153 (0.007)**	0.0022 (0.002)	0.0120 (0.015)	-0.0007 (0.007)	0.0003 (0.003)	0.0036 (0.016)	-0.0171 (0.008)**
exfin*TR	0.0013 (0.002)	-0.0016 (0.004)	0.0090 (0.005)*	-0.0004 (0.002)	-0.0062 (0.006)	-0.0029 (0.004)	-0.0002 (0.002)	-0.0028 (0.005)	0.0058 (0.005)
Exfin				0.0015 (0.001)**	0.0078 (0.002)***	0.0069 (0.002)***	0.0015 (0.000)***	0.0024 (0.001)**	0.0046 (0.001)***
small*Exfin				0.0001 (0.001)	-0.0054 (0.002)**	-0.0058 (0.003)**	0.0000 (0.000)	-0.0007 (0.001)	-0.0012 (0.001)
medium*Exfin				0.0016 (0.001)	-0.0080 (0.003)***	-0.0050 (0.003)	0.0011 (0.001)	-0.0007 (0.002)	-0.0021 (0.002)
large*Exfin				-0.0020 (0.001)**	-0.0059 (0.003)**	-0.0082 (0.003)***	-0.0002 (0.001)	0.0014 (0.002)	-0.0019 (0.002)
small				-0.2634 (0.051)***	-0.0861 (0.055)	-0.1323 (0.060)**	-0.1744 (0.021)***	-0.1645 (0.042)***	-0.1574 (0.034)***
medium				-0.2727 (0.049)***	0.0421 (0.086)	-0.1273 (0.073)*	-0.2453 (0.038)***	-0.1936 (0.057)***	-0.2008 (0.048)***
large				-0.1687 (0.059)***	-0.0280 (0.094)	-0.0148 (0.093)	-0.2404 (0.043)***	-0.2962 (0.075)***	-0.2535 (0.067)***
Constant	0.5408 (0.202)***	0.7374 (0.142)***	0.4906 (0.142)***	0.6175 (0.116)***	0.3288 (0.113)***	0.2304 (0.126)*	0.5483 (0.229)**	0.4339 (0.213)**	0.2679 (0.228)
Observations	910	837	905	13992	12707	13921	9533	7482	9447
R-squared	0.260	0.257	0.244	0.191	0.186	0.173	0.161	0.157	0.146

Robust standard errors clustered by region and 2-digit industry are in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 22: Effects of Line of Credit on Firm Growth**

VARIABLES	Turkey			Combined Countries			ECA Region		
	Method A	Method B	Method C	Method A	Method B	Method C	Method A	Method B	Method C
small*TR	-0.5325 (0.094)***	0.1495 (0.323)	0.2191 (0.244)	-0.3266 (0.134)**	0.4738 (0.298)	0.4365 (0.204)**	-0.4084 (0.117)***	0.3223 (0.268)	0.2575 (0.201)
medium*TR	-0.4798 (0.123)***	-0.0118 (0.459)	0.1278 (0.465)	-0.2415 (0.151)	0.2231 (0.486)	0.9871 (0.384)**	-0.3108 (0.136)**	0.3309 (0.388)	0.3841 (0.451)
large*TR	-0.3953 (0.126)***	0.4957 (0.820)	1.6450 (0.488)***	-0.1927 (0.158)	0.6596 (0.613)	1.7118 (0.784)**	-0.1960 (0.135)	1.0831 (0.746)	1.9220 (0.571)***
small*Line*TR	0.2520 (0.131)*	-0.8683 (0.500)*	-1.0829 (0.415)**	0.2712 (0.159)*	-0.9477 (0.453)**	-0.9059 (0.341)***	0.3004 (0.135)**	-0.8835 (0.428)**	-0.8691 (0.349)**
medium*Line*TR	0.2015 (0.130)	-0.6489 (0.648)	-0.9821 (0.644)	0.0856 (0.154)	-0.6607 (0.683)	-1.7526 (0.531)***	0.1538 (0.139)	-0.9634 (0.537)*	-1.0062 (0.632)
large*Line*TR	0.1315 (0.189)	-1.3292 (1.316)	-2.9986 (0.674)***	0.1297 (0.214)	-1.1903 (1.017)	-2.5348 (0.998)**	0.1465 (0.209)	-1.9684 (1.231)	-2.9395 (0.786)***
Line*TR	-0.1302 (0.132)	1.1217 (0.480)**	1.3855 (0.398)***	-0.2066 (0.131)	1.0860 (0.414)***	0.8213 (0.301)***	-0.2381 (0.123)*	1.0686 (0.380)***	0.8598 (0.333)***
Line				0.0983 (0.056)*	0.4694 (0.163)***	0.4609 (0.119)***	0.1157 (0.034)***	0.1552 (0.103)	0.3256 (0.088)***
small*Line				-0.0110 (0.065)	-0.5806 (0.205)***	-0.3662 (0.159)**	-0.0305 (0.040)	-0.0712 (0.119)	-0.0108 (0.091)
medium*Line				0.1271 (0.088)	-0.3461 (0.200)*	0.3061 (0.224)	0.0894 (0.073)	0.1557 (0.161)	0.1599 (0.166)
large*Line				-0.0140 (0.115)	-0.3280 (0.229)	-0.1203 (0.195)	-0.0537 (0.080)	0.3054 (0.207)	0.2115 (0.171)
small				-0.2535 (0.052)***	0.0896 (0.098)	-0.1037 (0.078)	-0.1663 (0.024)***	-0.1485 (0.064)**	-0.1923 (0.043)***
medium				-0.3242 (0.063)***	-0.0025 (0.097)	-0.5412 (0.125)***	-0.2800 (0.048)***	-0.2881 (0.087)***	-0.3946 (0.098)***
large				-0.2418 (0.097)**	-0.0168 (0.130)	-0.3040 (0.130)**	-0.2462 (0.061)***	-0.4177 (0.104)***	-0.5250 (0.105)***
Constant	0.8479 (0.191)***	0.0413 (0.296)	-0.0784 (0.229)	0.6147 (0.116)***	0.2289 (0.122)*	0.0499 (0.085)	0.5900 (0.228)***	0.4517 (0.178)**	0.3231 (0.233)
Observations	910	837	905	13992	12707	13921	9533	7482	9447
R-squared	0.242	0.267	0.278	0.179	0.185	0.188	0.156	0.161	0.159

Robust standard errors clustered by region and 2-digit industry are in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 23: Effects of Sales on Credit on Firm Growth**

VARIABLES	Turkey			Combined Countries			ECA Region		
	Method A	Method B	Method C	Method A	Method B	Method C	Method A	Method B	Method C
small*TR	-0.4628 (0.317)	0.0269 (0.542)	0.0422 (0.622)	-0.4294 (0.329)	-0.477981 (0.593)	-0.497928 (0.731)	-0.389449 (0.307)	0.417349 (0.368)	0.049358 (0.485)
medium*TR	-0.2693 (0.334)	0.7484 (1.146)	0.5499 (1.034)	-0.2220 (0.356)	0.215302 (0.929)	-0.483697 (0.929)	-0.038207 (0.302)	0.728064 (0.736)	-0.076710 (0.676)
large*TR	-0.5564 (0.358)	0.3701 (2.621)	-0.3512 (1.570)	-0.3211 (0.371)	2.432616 (1.498)	-0.055910 (1.123)	-0.374083 (0.361)	0.802909 (2.129)	-0.026109 (1.439)
small*Sales*TR	0.0010 (0.003)	-0.0048 (0.007)	-0.0047 (0.007)	0.0030 (0.004)	0.003324 (0.007)	0.003710 (0.009)	0.001657 (0.003)	-0.007737 (0.005)*	-0.003522 (0.006)
medium*Sales*TR	-0.0009 (0.004)	-0.0132 (0.014)	-0.0099 (0.012)	0.0001 (0.004)	-0.005079 (0.011)	0.003293 (0.011)	-0.002576 (0.004)	-0.011842 (0.009)	-0.001864 (0.008)
large*Sales*TR	0.0028 (0.003)	-0.0082 (0.029)	0.0005 (0.017)	0.0021 (0.004)	-0.029408 (0.017)*	-0.000639 (0.012)	0.002631 (0.004)	-0.010515 (0.024)	-0.000939 (0.015)
Sales*TR	-0.0027 (0.003)	-0.0055 (0.007)	-0.0014 (0.006)	-0.0047 (0.003)	-0.004546 (0.010)	-0.004300 (0.008)	-0.003806 (0.003)	0.001690 (0.006)	0.001077 (0.005)
Sales				0.0004 (0.001)	-0.002123 (0.003)	-0.003754 (0.002)*	-0.000178 (0.001)	-0.002020 (0.001)	-0.004240 (0.001)***
small*Sales				-0.0002 (0.001)	-0.002736 (0.002)	-0.000284 (0.002)	0.000835 (0.001)	0.001587 (0.001)	0.002790 (0.001)**
medium*Sales				0.0001 (0.002)	0.000698 (0.002)	0.003618 (0.002)	0.003063 (0.001)**	0.003929 (0.002)**	0.004048 (0.001)***
large*Sales				0.0018 (0.001)	0.003514 (0.002)	0.003409 (0.002)	0.000729 (0.001)	0.000189 (0.002)	0.000650 (0.002)
small				-0.2368 (0.083)***	0.005955 (0.191)	-0.218113 (0.167)	-0.232408 (0.066)***	-0.304172 (0.099)***	-0.375464 (0.102)***
medium				-0.2162 (0.193)	-0.249469 (0.182)	-0.523627 (0.180)***	-0.434137 (0.112)***	-0.501782 (0.130)***	-0.521427 (0.099)***
large				-0.3758 (0.113)***	-0.492451 (0.190)***	-0.507834 (0.182)***	-0.299343 (0.070)***	-0.296012 (0.131)**	-0.298916 (0.148)**
Constant	0.9021 (0.299)***	1.1074 (0.597)*	0.8684 (0.509)*	0.6142 (0.146)***	0.482701 (0.255)*	0.624383 (0.180)***	1.155548 (0.334)***	0.534179 (0.203)***	0.600917 (0.135)***
Observations	910	837	905	13992	12707	13921	9533	7482	9447
R-squared	0.241	0.260	0.235	0.164	0.178	0.164	0.148	0.158	0.143

Robust standard errors clustered by region and 2-digit industry are in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 24: Effects of Management Time Spent on Regulations on Firm Growth**

VARIABLES	Turkey			Combined Countries			ECA Region		
	Method A	Method B	Method C	Method A	Method B	Method C	Method A	Method B	Method C
small*TR	-0.4642 (0.097)***	-0.2670 (0.137)*	-0.3850 (0.127)**	-0.331389 (0.098)***	-0.220163 (0.152)	-0.262726 (0.152)*	-0.345151 (0.109)***	-0.079163 (0.136)	-0.205014 (0.111)*
medium*TR	-0.2966 (0.107)***	-0.3100 (0.145)**	-0.3725 (0.226)	-0.253134 (0.133)*	0.100086 (0.230)	-0.284083 (0.218)	-0.190789 (0.116)*	-0.111380 (0.146)	-0.236757 (0.169)
large*TR	-0.2507 (0.166)	0.3641 (0.421)	0.2698 (0.306)	-0.123070 (0.161)	0.805487 (0.299)***	0.159661 (0.318)	-0.155445 (0.171)	0.798593 (0.464)*	0.531945 (0.326)
small*Mngtime*TR	0.0047 (0.002)**	-0.0057 (0.006)	0.0000 (0.006)	0.010251 (0.004)***	0.003636 (0.008)	0.010654 (0.009)	0.005219 (0.003)*	-0.005934 (0.006)	-0.002939 (0.007)
medium*Mngtime*TR	0.0008 (0.003)	-0.0047 (0.006)	-0.0010 (0.008)	0.009259 (0.005)**	-0.014051 (0.011)	0.006721 (0.010)	0.002419 (0.004)	-0.003597 (0.007)	0.000108 (0.008)
large*Mngtime*TR	0.0005 (0.003)	-0.0287 (0.014)**	-0.0233 (0.011)**	0.005715 (0.005)	-0.036112 (0.012)***	-0.004394 (0.013)	0.003186 (0.004)	-0.036563 (0.017)**	-0.026228 (0.013)**
Mngtime*TR	-0.0035 (0.002)	0.0044 (0.003)	0.0043 (0.006)	-0.009096 (0.004)**	-0.006773 (0.007)	-0.011659 (0.007)	-0.003881 (0.003)	0.003387 (0.005)	0.003471 (0.006)
Mngtime				0.005130 (0.003)*	0.005568 (0.004)	0.010550 (0.005)**	0.000146 (0.001)	0.001320 (0.003)	0.000549 (0.003)
small*Mngtime				-0.004863 (0.003)	-0.006666 (0.005)	-0.012743 (0.005)**	0.000174 (0.001)	-0.001658 (0.003)	0.000576 (0.003)
medium*Mngtime				-0.008188 (0.003)***	0.004328 (0.006)	-0.003624 (0.006)	-0.001872 (0.002)	-0.004789 (0.004)	-0.002565 (0.005)
large*Mngtime				-0.004741 (0.003)	-0.002097 (0.005)	-0.010403 (0.005)**	-0.002839 (0.002)*	-0.000318 (0.004)	-0.001799 (0.005)
small				-0.180291 (0.047)***	-0.138255 (0.053)***	-0.095589 (0.047)**	-0.163034 (0.026)***	-0.166644 (0.039)***	-0.161175 (0.032)***
medium				-0.121008 (0.049)**	-0.280400 (0.074)***	-0.221316 (0.067)***	-0.169705 (0.050)***	-0.147263 (0.054)***	-0.171190 (0.062)***
large				-0.170568 (0.061)***	-0.171387 (0.098)*	-0.106625 (0.061)*	-0.145089 (0.057)**	-0.263925 (0.070)***	-0.214906 (0.054)***
Constant	0.6842 (0.135)***	0.6027 (0.123)***	0.6712 (0.143)**	0.572666 (0.108)***	0.393322 (0.127)***	0.281085 (0.133)**	0.547777 (0.071)***	0.913582 (0.170)***	0.296344 (0.111)***
Observations	824	831	905	13057	12663	13921	8369	7253	9447
R-squared	0.232	0.260	0.240	0.185	0.184	0.170	0.146	0.162	0.138

Robust standard errors clustered by region and 2-digit industry are in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 25: Effects of External Financing with Age on Firm Growth**

VARIABLES	Turkey			Combined Countries			ECA Region		
	Method A	Method B	Method C	Method A	Method B	Method C	Method A	Method B	Method C
Small*Exfin*Age*TR	0.000481 (0.000)**	-0.000428 (0.001)	0.000010 (0.000)	0.000329 (0.000)	0.000961 (0.001)	-0.000776 (0.000)*	0.000381 (0.000)*	0.000051 (0.001)	0.000400 (0.000)*
Medium*Exfin*Age*TR	0.000598 (0.000)***	-0.001349 (0.001)*	-0.000364 (0.000)	0.000466 (0.000)**	-0.000491 (0.001)	0.000951 (0.000)**	0.000428 (0.000)*	-0.001042 (0.001)	0.000315 (0.000)
Large*Exfin*Age*TR	0.000590 (0.000)**	-0.000313 (0.001)	-0.000691 (0.001)	0.000373 (0.000)	0.000239 (0.001)	0.000561 (0.000)	0.000349 (0.000)	0.000240 (0.001)	-0.000185 (0.000)
Exfin*Age*TR	-0.000637 (0.000)***	0.000927 (0.001)	0.000059 (0.000)	-0.000480 (0.000)**	-0.000075 (0.001)	-0.000230 (0.000)	-0.000469 (0.000)**	0.000378 (0.001)	-0.000456 (0.000)
Exfin*Age				-0.000114 (0.000)*	-0.000170 (0.000)	0.000168 (0.000)	-0.000154 (0.000)*	0.000190 (0.000)	-0.000074 (0.000)
Small*Exfin*Age				0.000118 (0.000)	0.000069 (0.000)	0.000928 (0.001)	0.000111 (0.000)	-0.000007 (0.000)	0.000060 (0.000)
Medium*Exfin*Age				0.000074 (0.000)	0.000075 (0.000)	-0.000085 (0.000)	0.000139 (0.000)	-0.000157 (0.000)	0.000162 (0.000)
Large*Exfin*Age				0.000116 (0.000)	0.000266 (0.000)	-0.000334 (0.000)	0.000154 (0.000)*	-0.000139 (0.000)	0.000204 (0.000)
Age				0.000258 (0.003)	-0.000034 (0.004)	-0.004419 (0.004)	-0.006997 (0.003)**	-0.012591 (0.005)***	-0.004707 (0.001)***
Age*TR	-0.006458 (0.004)	-0.038815 (0.020)*	-0.016096 (0.013)	-0.008995 (0.005)*	-0.007088 (0.024)	0.006972 (0.012)	-0.000255 (0.005)	-0.015996 (0.025)	0.005343 (0.006)
Constant	0.613059 (0.184)***	1.066116 (0.304)***	0.510047 (0.169)***	0.264518 (0.101)***	0.293068 (0.116)**	0.267094 (0.126)**	0.519634 (0.226)**	0.722842 (0.224)***	0.271608 (0.099)***
Observations	910	837	905	13992	12707	13921	9533	7482	9447
R-squared	0.304	0.284	0.263	0.201	0.194	0.182	0.176	0.167	0.154

Robust standard errors clustered by region and 2-digit industry are in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 26: Effects of Line of Credit with Age on Firm Growth**

VARIABLES	Turkey			Combined Countries			ECA Region		
	Method A	Method B	Method C	Method A	Method B	Method C	Method A	Method B	Method C
Small*Line*Age*TR	0.012135 (0.012)	0.057824 (0.051)	-0.017127 (0.037)	0.006869 (0.012)	0.119209 (0.047)**	0.065649 (0.037)*	0.007865 (0.013)	0.064474 (0.054)	0.052470 (0.038)
Medium*Line*Age*TR	0.005197 (0.015)	0.048236 (0.040)	-0.012894 (0.038)	0.013630 (0.014)	0.081042 (0.047)*	0.068790 (0.040)*	0.008269 (0.013)	0.043156 (0.044)	0.028730 (0.036)
Large*Line*Age*TR	0.024360 (0.017)	0.012961 (0.081)	0.133049 (0.045)***	0.020008 (0.018)	0.036838 (0.078)	0.177166 (0.043)***	0.025049 (0.018)	0.017350 (0.084)	0.179104 (0.039)***
Line*Age*TR	-0.011907 (0.011)	-0.076725 (0.039)*	-0.015332 (0.033)	-0.007778 (0.012)	-0.106118 (0.042)**	-0.067476 (0.031)**	-0.008159 (0.011)	-0.075881 (0.041)*	-0.065087 (0.032)**
Line*Age				-0.001918 (0.005)	0.009544 (0.013)	0.007127 (0.012)	-0.003112 (0.005)	-0.012534 (0.015)	0.015481 (0.013)
Small*Line*Age				-0.000768 (0.006)	-0.016804 (0.015)	-0.004047 (0.015)	0.001518 (0.006)	0.014751 (0.019)	-0.019793 (0.014)
Medium*Line*Age				-0.006738 (0.006)	-0.015158 (0.015)	-0.018077 (0.013)	0.001644 (0.005)	0.017483 (0.017)	-0.020910 (0.013)
Large*Line*Age				0.000962 (0.007)	-0.020966 (0.017)	-0.004838 (0.014)	-0.002052 (0.007)	0.018232 (0.016)	-0.016879 (0.014)
Age				-0.000749 (0.003)	-0.008652 (0.006)	-0.004136 (0.005)	-0.007443 (0.004)*	-0.002960 (0.008)	-0.014521 (0.005)***
Age*TR	-0.009053 (0.006)	0.035470 (0.022)	-0.003891 (0.018)	-0.011069 (0.007)	0.052473 (0.022)**	0.023566 (0.015)	-0.002555 (0.007)	0.043100 (0.023)*	0.027248 (0.015)*
Constant	0.906420 (0.247)***	-0.580034 (0.488)	-0.118841 (0.368)	0.275095 (0.107)***	0.135513 (0.126)	0.156665 (0.127)	0.578290 (0.229)**	0.437779 (0.193)**	0.407483 (0.242)*
Observations	910	837	905	13992	12707	13921	9533	7482	9447
R-squared	0.264	0.291	0.299	0.190	0.193	0.195	0.167	0.170	0.171

Robust standard errors clustered by region and 2-digit industry are in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 27: Effects of Sales on Credit with Age on Firm Growth**

VARIABLES	Turkey			Combined Countries			ECA Region		
	Method A	Method B	Method C	Method A	Method B	Method C	Method A	Method B	Method C
Small*Sales*Age*TR	-0.000480 (0.000)	0.000080 (0.001)	-0.000207 (0.000)	-0.000474 (0.000)	0.001041 (0.001)	0.000261 (0.001)	-0.000285 (0.000)	0.001142 (0.001)*	0.000564 (0.000)
Medium*Sales*Age*TR	-0.001029 (0.000)**	0.000518 (0.001)	0.000694 (0.001)	-0.001086 (0.000)***	0.000893 (0.001)	0.001073 (0.001)	-0.000775 (0.000)**	0.001491 (0.001)*	0.001070 (0.001)
Large*Sales*Age*TR	-0.000334 (0.000)	0.002893 (0.001)**	-0.000315 (0.001)	-0.000430 (0.000)	0.002838 (0.001)**	0.000418 (0.001)	-0.000196 (0.000)	0.003013 (0.001)***	0.000051 (0.001)
Sales*Age*TR	0.000703 (0.000)***	0.000508 (0.001)	0.000222 (0.000)	0.000772 (0.000)***	-0.000428 (0.001)	-0.000304 (0.001)	0.000549 (0.000)**	-0.000500 (0.001)	-0.000337 (0.000)
Sales*Age				-0.000070 (0.000)	0.000232 (0.000)	0.000300 (0.000)	0.000108 (0.000)	0.000097 (0.000)	0.000176 (0.000)
Small*Sales*Age				0.000049 (0.000)	-0.000075 (0.000)	-0.000226 (0.000)	-0.000118 (0.000)	-0.000114 (0.000)	-0.000148 (0.000)
Medium*Sales*Age				0.000074 (0.000)	-0.000289 (0.000)	-0.000417 (0.000)*	-0.000123 (0.000)	-0.000037 (0.000)	-0.000167 (0.000)
Large*Sales*Age				0.000066 (0.000)	-0.000143 (0.000)	-0.000321 (0.000)	-0.000122 (0.000)	0.000005 (0.000)	-0.000109 (0.000)
Age				0.004499 (0.015)	-0.024829 (0.019)	-0.028471 (0.018)	-0.017531 (0.009)**	-0.016280 (0.013)	-0.022610 (0.014)*
Age*TR	-0.075938 (0.022)***	-0.056538 (0.059)	-0.032046 (0.021)	-0.081808 (0.027)***	0.027087 (0.078)	0.014507 (0.049)	-0.054306 (0.023)**	0.037889 (0.050)	0.023608 (0.032)
Constant	1.548690 (0.445)***	1.858979 (0.983)*	1.184320 (0.692)*	0.242093 (0.171)	0.665229 (0.321)**	0.962231 (0.278)***	1.629938 (0.446)***	0.625593 (0.230)***	0.761041 (0.171)***
Observations	910	837	905	13992	12707	13921	9533	7482	9447
R-squared	0.277	0.283	0.250	0.171	0.185	0.171	0.161	0.167	0.152

Robust standard errors clustered by region and 2-digit industry are in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 28: Effects of Management Time Spent on Regulations with Age on Firm Growth**

VARIABLES	Turkey			Combined Countries			ECA Region		
	Method A	Method B	Method C	Method A	Method B	Method C	Method A	Method B	Method C
Small*Mngtime*Age*TR	0.000066 (0.000)	0.001264 (0.001)	0.001804 (0.001)***	0.000374 (0.000)	0.000943 (0.001)	0.001058 (0.001)*	0.000200 (0.000)	0.000496 (0.001)	0.000822 (0.001)
Medium*Mngtime*Age*TR	-0.000004 (0.000)	0.001861 (0.001)*	0.002077 (0.001)***	0.000484 (0.000)	0.002376 (0.001)**	0.001518 (0.001)***	0.000190 (0.000)	0.001344 (0.001)	0.001048 (0.001)**
Large*Mngtime*Age*TR	-0.000197 (0.000)	0.001408 (0.001)	0.003417 (0.001)***	0.000269 (0.000)	0.004100 (0.001)***	0.001849 (0.001)**	0.000044 (0.000)	0.000653 (0.001)	0.002245 (0.001)***
Mngtime*Age*TR	-0.000044 (0.000)	-0.001282 (0.001)	-0.001726 (0.001)***	-0.000571 (0.000)*	-0.001137 (0.001)	-0.001041 (0.000)***	-0.000235 (0.000)	-0.000454 (0.001)	-0.000697 (0.000)
Mngtime*Age				0.000584 (0.000)**	-0.000098 (0.000)	0.000258 (0.000)	0.000202 (0.000)	-0.000898 (0.000)**	-0.000406 (0.000)
Small*Mngtime*Age				-0.000394 (0.000)*	0.000175 (0.000)	-0.000250 (0.000)	-0.000144 (0.000)	0.000905 (0.000)**	0.000363 (0.000)
Medium*Mngtime*Age				-0.000519 (0.000)**	-0.000244 (0.000)	-0.000298 (0.000)	-0.000191 (0.000)	0.000673 (0.000)	0.000285 (0.000)
Large*Mngtime*Age				-0.000558 (0.000)**	-0.000273 (0.000)	-0.000261 (0.000)	-0.000315 (0.000)	0.000788 (0.000)*	0.000241 (0.000)
Age				-0.011551 (0.004)***	-0.002743 (0.003)	-0.004555 (0.004)	-0.010668 (0.004)***	0.000021 (0.006)	-0.005065 (0.005)
Age*TR	-0.008895 (0.007)	0.014331 (0.017)	0.005100 (0.005)	-0.000249 (0.007)	0.015707 (0.021)	0.000370 (0.006)	0.000792 (0.007)	0.014531 (0.019)	0.004889 (0.006)
Constant	0.824606 (0.099)***	0.439563 (0.205)**	0.359524 (0.188)*	0.381653 (0.120)***	0.393323 (0.134)***	0.301191 (0.139)**	0.625905 (0.078)***	0.621094 (0.339)*	0.360290 (0.115)***
Observations	824	831	826	13057	12663	13921	8369	7253	9447
R-squared	0.243	0.288	0.297	0.205	0.193	0.176	0.155	0.175	0.149

Robust standard errors clustered by region and 2-digit industry are in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1