



THE EFFECT OF CORRUPTION ON FIRM GROWTH: EVIDENCE FROM FIRMS IN TURKEY

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ABSTRACT

To our knowledge, there is no micro-level study paying attention to the influence of corruption on firm growth. We aim to fill this gap in the literature. This paper therefore contributes to the limited literature on the link between corruption and firm growth in a single country, Turkey. To estimate the relationship between firm growth and corruption, we analyze a sample of 41 firms from manufacturing firms in Turkey, covering the period from 2008 to 2011 by using static panel techniques. The study find evidence that the effect of corruption level, profitability and financial leverage on the growth of the firms is significantly positive in all case, but financial risk rating is negative. We find specifically a significantly positive relation between the growth of private firms and corruption level. This leads that corruption could increase economic development, mainly because illegal practices and payments as 'speed money' could surpass bureaucratic delays; the acceptance of bribes in government employees could work as an incentive and increase their efficiency and because corruption is possibly the price people are forced to pay as a result of market failures. The results of this study provide managerial implications for industrial companies from Turkey: Company managers should increase profitability, should reach economies of scale, an optimal capital structure level and reach the optimal level of working capital level due to profitable firms grow faster than other companies. We also suggest that policy-makers improve in public governance quality and the leveling of the playing field for firms in all business sectors to reduce corruption level because firms tend to pay bribes and the time that is wasted on bureaucratic procedures and engage in corrupt practices in an attempt to promote their short-term growth by facilitating transactions in the bureaucratic process.

Keywords: Corruption, Financial risk, Firm growth, Panel data techniques, Turkey.

JEL Classification: D73, O16, G30

1. INTRODUCTION

International organizations, policy makers and governments are increasingly interested in the effects of corruption on economic development, with anti-corruption strategies being promoted worldwide (Athanasouli *et al.*, 2012). A concise and roughly precise definition of corruption is the misuse of public office in order to gain private benefit. Corruption around the world is believed to be endemic and pervasive and a significant contributor to low economic growth, to stifle investment, to inhibit the provision of public services and to increase inequality to such an extent that international organizations like World Bank have identified corruption as ‘the single greatest obstacle to economic and social development’ (Bolgorian, 2011). Corruption is one of the most pervasive obstacles to economic and social development (Wang and You, 2012). Fighting corruption is high on the policy agenda of many international organizations as well as governments in both developing and developed countries (Nguyen and Dijk, 2012).

It is related to two main strands of literature. The first strand of literature assesses corruption as an obstacle to economic growth. The relationship between corruption and economic growth has been broadly studied in the literature. From the theoretical point of view, many researchers attempt to explain this phenomenon by addressing various issues in the macroeconomics of misgovernance (e.g., (Ehrlich and Lui, 1999; Sarte, 2000)). A considerable amount of empirical evidence shows that corruption directly deters economic growth and development (e.g., (Knack and Keefer, 1995; Keefer and Knack, 1997; Ades and Di Tella, 1999; Méon and Sekkat, 2005)). However, it is reasonable to be cautious about the strong negative correlation between corruption and growth. The incidence of corruption may vary markedly across countries, and significant diversity clearly exists conditional on other social and economic factors. That is, corruption benefits growth at low levels of economic development and becomes detrimental to growth as the economy develops to a high level (e.g., (Méndez and Sepúlveda, 2006; Neeman *et al.*, 2008; Méon and Weill, 2010)). Almost all empirical studies in the literature to date measure and analyze corruption at the country-level (e.g. (Ades and Di Tella, 1999; Treisman, 2000; Herzfeld and Weiss, 2003; Méndez and Sepúlveda, 2006; Ahlin and Pang, 2008)).

The second strand of the empirical literature focuses on firm growth and demonstrates differing results. Some studies have supported the hypothesis that corruption can speed up the wheels of commerce and have a positive impact on firm development, by giving the possibility to overcome bureaucratic barriers and surpass timely processes (Wei, 1998). Recently, firm-level research of corruption in China has been conducted by Hallward-Driemeier *et al.* (2004). They found that external finance significantly improves firm performance and the total number of days in dealing with government inspectors positively affects firms' sales growth, though the magnitude is very small. World Bank (2003) shows that corruption, has negative impact on firms' growth rates of sales, but the impact is not statistically significant. In the existing literature, empirical studies on corruption and economic growth are abounding.

To our knowledge, empirical studies on corruption and firm growth in Turkey remain scarce. That is, there is no micro-level study paying attention to the influence of corruption on firm growth.

We intend to fill this gap in the literature. This paper aims to investigate the impact of corruption on firm growth in Turkey. Firm growth has been one of the most important topics studied in business literature. A firm's growth has appeared to be a multifaceted phenomenon, since there are many variables which could influence it. [Gibrat \(1931\)](#) was the first to investigate firm growth patterns, his work resulting in Gibrat's Law, or the Law of Proportionate Effects (LPE). Since the formulation of Gibrat's Law, the literature on the topic of the determinants of growth has greatly increased. Since then, theoretical contributions to the subject of firms' growth have been divided into two approaches: deterministic and stochastic ([Garcia-Manjon and Romero-Merino, 2012](#)). The deterministic approach assumes that differences in the firms' growth rate depend on observable industry and firm-specific characteristics. [Hannan and Freeman \(1977\)](#) and [Dess and Beard \(1984\)](#) argue that environment, more than internal factors, determines a firm's growth. In contrast to the deterministic approach, the stochastic approach, based on Gibrat's Law, predicts growth rates independent of firm size. According to the Gibrat's Law, firm size has no systematic effect on the rate of firm growth. This suggests that, although the actual rate of firm growth is stochastic, the expected growth rate is the same across all sizes of firms.

Besides the studies examining the relationship between firm size and firm growth ([Evans, 1987](#); [Hall, 1987](#); [Dunne and Hughes, 1994](#); [Hart and Oulton, 1996](#); [Wilson and Morris, 2000](#); [Geroski and Gugler, 2004](#); [Mudambi and Swift, 2011](#); [Garcia-Manjon and Romero-Merino, 2012](#)), studies establishing a relationship between variables such as leverage ([Opler and Titman, 1994](#); [Chittenden et al., 1996](#); [Billett et al., 2007](#); [Mudambi and Swift, 2011](#); [Wu and Yeung, 2012](#)), profitability ([Davidsson et al., 2009](#); [Bottazzi et al., 2010](#); [Coad, 2010](#); [Jang and Park, 2011](#); [Mudambi and Swift, 2011](#); [Kouser et al., 2012](#); [Delmar et al., 2013](#)), liquidity ([Adams and Buckle, 2003](#); [Goddard et al., 2005](#)) and the growth of the company has been conducted.

The present article is organized as follows: following this introduction the theoretical background of firms' growth and influencing factors is provided in Section 2; methodology and data are presented in Section 3; empirical analysis, including major findings, is presented in Section 4; in Section 5 we provide conclusions and future lines of research.

2. THEORETICAL FRAMEWORK

2.1. Relationship between Corruption and Firm Growth

We focus on the effect of corruption on firm growth in Turkey. At the firm level, profit maximizing firms would be expected to decide an optimal amount of corruption that would allow them to maximize their profits, while the contextual effect of corrupt practices on firm performance could be either positive or negative, depending on whether the negative spillovers of corrupt practices dominate the first potential positive effect. Hence, the effect of corruption on firm performance is ultimately an empirical question. The empirical literature focuses on firm growth and demonstrates differing results. In particular, in many countries the effects of corruption on individual firms are likely to differ due to the unequal treatment of public officials of firms in the private and state sectors of the economy ([Nguyen and Dijk, 2012](#)). Some studies have supported

the hypothesis that corruption can speed up the wheels of commerce and have a positive impact on firm development, by giving the possibility to overcome bureaucratic barriers and surpass timely processes (Wei, 1998). Kaufmann and Wei (1999) find a positive correlation in the tendency of firms to pay bribes and the time that is wasted on bureaucratic procedures. In some cases, firms engage in corrupt practices in an attempt to promote their short-term growth by facilitating transactions in the bureaucratic process. Ades and Di Tella (1999) show that higher corruption occurs in economies with trade barriers, where domestic businesses are less exposed to global competition, or where there are only few dominant businesses. Fisman and Svensson (2007) find that bribery payments work similarly to taxes on firms, and a one-percentage point increase in the bribery rate is associated with a reduction in firm growth of three percentage points. Svensson (2003) suggest that though corruption deters economic growth at the macro-level, bribe payments correlate positively with a cross-section firm growth in Uganda. World Bank (2003) shows that corruption, has negative impact on firms' growth rates of sales, but the impact is not statistically significant. Asiedu and Freeman (2009) find that the effect of corruption on investments varies significantly across regions: corruption has a negative and significant effect on investment growth for firms in Transition countries but has no significant impact for firms in Latin America and Sub-Saharan Africa. Rand and Tarp (2010) show that the incidence of bribe payments by Vietnamese firms is associated with several firm characteristics, and that bribe payments have a negative effect on firm growth. Wang and You (2012) suggest that the “good corruption” components are used as “speed money”, which could promote firm growth by overcoming the less efficient regulations. This is also consistent with the well-known “speed money” hypothesis. Wang and You (2012) find that corruption is likely to contribute to firms' growth. They suggest that corruption appears not to be a vital constraint on firm growth if financial markets are underdeveloped. Nguyen and Dijk (2012) find a significantly negative relation between the growth of private firms and the severity of corruption as perceived by these firms. It has been supported that corruption could increase economic development, mainly because illegal practices and payments as ‘speed money’ could surpass bureaucratic delays; the acceptance of bribes in government employees could work as an incentive and increase their efficiency (Leff, 1964; Huntington, 1968); and because corruption is possibly the price people are forced to pay as a result of market failures (Acemoglu and Verdier, 2000). In the existing literature, empirical studies on corruption and economic growth are abounding. However, to our knowledge, there is no micro-level study giving importance to the influence of corruption on firm growth in Turkey as we mentioned above. We intend to fill this gap in the literature.

2.2. Relationship between the Profitability and Firm Growth

Firm growth and profitability have drawn a great deal of attention in the literature. *Growth of the Fitter theory* was presented by Alchian (1950). According to this theory, fitness is depicted by the firm profit, and the profitable firms grow and survive in the market while the other firms exit due to poor performance (Kouser *et al.*, 2012). Alchian (1950) theoretical study argued that fitter

firms grow and survive, but less vigorous firms lose their market share and exit through the evolutionary selection mechanism. Thus, if profit rates reflect the degree of fitness, it is possible to predict that profitable firms will grow (Jang and Park, 2011). Delmar *et al.* (2013) suggests that more profitable firms may have higher potential to grow, since they have already shown a greater fit with the environment and may be able to fund future competitive actions with their own cash flow. Profitability thereby limits the risk related to acquiring and relying on external resources of financing but also displays a satisfactory level of market demand. Mukhopadhyay and AmirKhalkhali (2010) posit that profit provides the funds for growth. A firm can grow internally through investments in development projects in various ways. It can take advantage of technological opportunities to grow through research and development, leading to product and process innovations. Empirically, firm growth and profitability both are of great concern for the organization but there is still no generalized relationship between them. Many of researchers find evidence that profitability has a positive effect on firm growth (Goddard *et al.*, 2004; Coad, 2007, 2010; Davidsson *et al.*, 2009; Serrasqueiro, 2009; Bottazzi *et al.*, 2010; Jang and Park, 2011; Mudambi and Swift, 2011; Kouser *et al.*, 2012; Delmar *et al.*, 2013), while the other studies (Hoy *et al.*, 1992; Reid, 1995) find that profitability is negatively affected by growth.

2.3. Relationship between Firm Size and Firm Growth

Gibrat (1931) was the first to investigate firm growth patterns, his work resulting in *Gibrat's Law, or the Law of Proportionate Effects (LPE)* (Goddard *et al.*, 2009). Gibrat's law implies that with a random growth process, the expected growth rate is independent of a firm's size and other identifiable firm and industry characteristics (Mukhopadhyay and AmirKhalkhali, 2010). According to the LPE, firm size has no systematic effect on the rate of firm growth. This suggests that, although the actual rate of firm growth is stochastic, the expected growth rate is the same across all sizes of firms (Nakano and Kim, 2011). Empirical studies researching on the relationship between firm size and growth is ambiguous; some studies have found no relationship, others have found a positive relationship (Mansfield, 1962; Singh and Whittington, 1975). Several studies have used the Gibrat's law to explain the firm size-distribution of the large firms in the United States (Ijiri and Simon, 1974; Vining, 1976; Chesher, 1979; AmirKhalkhali and Mukhopadhyay, 1993; Almus and Nerlinger, 2000; Audretsch *et al.*, 2004). However, recent empirical studies have rejected the LPE and claimed that there is an inverse relationship between firm growth and firm size (Wilson and Morris, 2000; Geroski and Gugler, 2004; Rufin, 2007; Mudambi and Swift, 2011; Garcia-Manjon and Romero-Merino, 2012; Delmar *et al.*, 2013). These studies showed that small firms rapidly grow than large firms. The reason behind is that small firms struggle to achieve economies of scale. Small firms grow rapidly than the large firms while the firms that have gained economies of scale cannot grow further, due to the reduction of cost up to a minimum level.

2.4. Relationship between Leverage and Firm Growth

The optimal capital structure theory indicates that the negative effect of leverage on growth enhances firm value because the leverage prevents managers from taking on poor projects (Jensen, 1986). Opler and Titman (1994), Goyal *et al.* (2002), Billett *et al.* (2007), Mudambi and Swift (2011) and Wu and Yeung (2012) empirically found that firm growth is lower in firms with higher leverage. These studies imply the influence of leverage on growth could be negative. However, the prior literature on the relationship between leverage and growth has shown mixed results. Hurdle (1974) reported that leverage positively influences profitability. Debt could yield a disciplinary effect, as stated in the free cash flow hypothesis (Jensen, 1986). Firms with high debt leverage can also decrease wasteful investment opportunities and increase firm performance, suggesting a positive relationship between debt leverage and firm growth. However, too much use of debt could deteriorate firm performance by taking on overly risky projects (Jang and Park, 2011). Additionally, using debt can increase conflicts between debt and equity holders. According to theoretical and empirical literature, agency problems and risk-taking behavior are different depending on the nature of the shareholder. An issue is the conflict of interest between managers and shareholders identified by Jensen and Meckling (1976). Theory indicates that shareholders with a diversified portfolio are motivated to take more risk for a higher expected return whereas managers take less risk to protect their position and personal benefits and to preserve their acquired human capital. That is, equity holders tend to support the use of debt (Jensen and Meckling, 1976). We therefore predict that the effect of leverage on firm growth is positive because debt could yield a disciplinary effect, as stated in the free cash flow hypothesis and firms with high debt leverage can also decrease wasteful investment opportunities, while the effect of leverage on firm growth is negative because the optimal capital structure theory indicates that the negative effect of leverage on growth enhances firm value because the leverage prevents managers from taking on poor projects and too much use of debt could deteriorate firm performance by taking on overly risky projects. That is, in companies to reach the optimal capital structure, leverage is expected to positively affect firm growth. This means that there is a positive effect of leverage on growth. Otherwise leverage level adversely affects firm growth. Consequently, we incorporated leverage as a control variable due to its important potential effects on firm growth.

2.5. Relationship between Liquidity and Firm Growth

On one hand, the possible catalyzing effect of liquidity on profitability, as a consequence of the greater possibility of meeting short-term commitments, seems not to be sufficiently relevant for greater liquidity to mean increased profitability. On the other hand, the possible restrictive effect of liquidity on profitability, as a consequence of managers investing in unprofitable projects also seems insufficiently relevant for greater liquidity to mean diminished profitability (Serrasqueiro, 2009). Adams and Buckle (2003) obtain a negative and statistically significant relationship between liquidity and profitability for firms in Bermuda, while Goddard *et al.* (2005), in the context of Belgian, French, Italian, Spanish and British companies, find positive relationships

between liquidity and profitability. We therefore predict that, in companies to reach an optimal level of working capital, liquidity is expected to positively affect firm growth. Otherwise liquidity level adversely affects firm growth.

3. METHODOLOGY AND DATA

3.1. Method and Empirical Models

In recent years, the uses of panel data models are frequently encountered in the field of finance and economy. We examine the effect of corruption on firm growth with the panel data methodology, because of the benefits it provides. Baltagi (2005) and Hsiao (2002) indicate panel data methodology controls for individual heterogeneity, reduces problems associated with multicollinearity and estimation bias, and specifies the time-varying relation between dependent and independent variables.

Using time series data, a certain time period of one or more variable values are observed (e.g., GDP for several quarters or years). In cross-section data, values of one or more variables are collected for several sample units, at the same point in time (e.g., crime rates for 50 states in the United States for a given year). On the other hand, panel data allows examination of the same cross-sectional unit over time. In other words panel data set has both time series and cross-sectional dimension (Gujarati, 2004). Panel data models are divided into static and dynamic models. In dynamic panel models, the lagged values of the dependent variable are included in the model as an explanatory variable while it is not included in the static models. We use static panel techniques to analyze the relationship between firm growth and corruption in this paper. There are two basic static panel data model: fixed effects model and random effects model. In fixed effects model, different constant coefficients are formed for each cross-sectional units. It is assumed that the constant coefficients show changes between the cross-sectional units in the model. Accordingly fixed effects model constant coefficients vary with units or both units and time (Hsiao, 2002). Conversely, in random effects model time-dependent changes in units or both units and time are included in the model as a component of the error term. The advantage of fixed effects model over random effects model is that it is not lead to the loss of degrees of freedom (Baltagi, 2005). Hausman test is one of the methods used to determine that which one is more appropriate between the fixed effect model and random effect model. This test is based upon an instrumental variable estimator which uses both the between and within variation of the strictly exogenous variables as instruments (Baltagi *et al.*, 2003). Hausman test is tested the H0 hypothesis (null hypothesis) in the shape of 'random effects estimator is true'. As a result of Hausman test, if the null hypothesis is accepted it means the use of random effects model is applied. On the other hand, fixed effects model is preferable in case of rejection of the null hypothesis (Baltagi, 2005).

Following the literature on firm growth (Garcia-Manjon and Romero-Merino, 2012; Nguyen and Dijk, 2012; Wang and You, 2012; Wu and Yeung, 2012), we use regressions to examine the effect of corruption on firm growth. We estimate the following regression equation:

$$GROWTH_{i,t} = \alpha + \beta_1 CORRUPTION_{it} + \beta_2 PROFITABILITY_{it} + \beta_3 SIZE_{it-1} + \beta_4 LEVERAGE_{it} + \beta_5 LIQUIDITY_{it} + \beta_6 FINANCIALRISK_{it} + \delta_t + \varepsilon_{it} Eq (1)$$

Where subscripts i and t indicate firm and time period, respectively. β_0 that is common to all recipient firms. Where: $GROWTH_{i,t}$, is dependent variable, firm asset growth in the current period. In line with previous research (Nguyen and Dijk, 2012; Wu and Yeung, 2012), we use asset growth rate (book value of asset of end of the year t - end of the year $t-1$ / book value of asset of end of the year $t-1$). $CORRUPTION_{it}$ is corruption level in the current period. We use Corruption Perception Index (CPI) to measure corruption level. Although corruption is a variable that cannot be measured directly, in recent years, some organizations have provided corruption indices across a wide range of countries to qualitatively assess the level of corruption. One of the most renowned indices is the Corruption Perception Index published by Transparency International. This index is an aggregate indicator that classifies countries based on the degree to which corruption is perceived to exist among politicians and public authorities. The Corruption Perceptions Index measures the perceived levels of public sector corruption in countries worldwide. The CPI scores countries on a scale from 0 (highly corrupt) to 100 (very clean) (TI, 2012). That means the higher score of a country shows corruption is low in this country. In the literature CPI which published by Transparency International is often used to measure the level of corruption in countries. Before 2012 the values ranging from 0 to 10 points was used for the calculation of the CPI, but from 2012 it has started to use values between 0 and 100 points. So a CPI value in this study consists of values between 0 and 10 because of the number of years covered by the study.

$PROFITABILITY_{it}$, is company profitability in the current period. There are two common methods to measure profitability such as return on assets (ROA) and return on equity (ROE) in the previous studies. ROA is the measure of how well a company uses its assets to generate profit. ROA give a long-term view of the performance of the firm (Vijayakumar and Devi, 2011). Many researchers have used ROA as the measure of profitability (Kouser et al., 2012; Delmar et al, 2013) because it truly reflects the positions of the company. It reflects that how much income is earned through the assets of the firm. ROE is the measure of the firm to earn a profit from the money invested by the shareholders. ROA and ROE give a long-term view of the performance of the firm (Vijayakumar and Devi, 2011). Hall and Weiss (1967) and Vijayakumar and Devi (2011) have used ROE because it shows the profit earned by the equity holders. Similar to the studies, we measure profitability by the most generally employed alternative measures: Return on Asset (ROA) and Return on Equities (ROE). $SIZE_{it}$, is firm size in the current period. We use two alternative firm size measures. SIZE1 and SIZE2 show total assets from its balance sheet as well as the firm's sales. We use the logarithm of a firm's total assets and total sales from its balance sheet to control for size in my regression analysis for that purpose which is mainly adopted by other researches (Hall and Weiss, 1967; Samuels and Smyth, 1968; Mudambi and Swift, 2011; Rahaman, 2011; Kouser et al., 2012; Wu and Yeung, 2012). $LEVERAGE_{it}$, is total debt to equity ratio in the current period (LEV), we incorporated leverage as a control variable due to its important potential effects

on firm growth. Debt leverage was also incorporated in all models as a control variable, which was calculated as total debt divided by the total equity, following empirical the studies (Serrasqueiro, 2009; Mudambi and Swift, 2011; Nakano and Kim, 2011). $LIQUIDITY_{it}$ is firm liquidity in the current period (LIQ). Liquidity will be measured by making use of Current ratio, which is composed out current asset/current liabilities, following the Adams and Buckle (2003), Goddard *et al.* (2005), (Serrasqueiro, 2009), Rahaman (2011).

$FINANCIALRISK_{it}$ is financial risk index from ICRG in the current period (FR). The overall aim of the financial risk rating is to provide a means of assessing a country's ability to pay its way. In essence, this requires a system of measuring a country's ability to finance its official, commercial, and trade debt obligations. According to ICRG Methodology, the financial risk includes following: foreign debt as a percentage of GDP, foreign debt service as a percentage of exports of goods and services, current account as a percentage of exports of goods and services, net international liquidity as months of import cover, exchange rate stability. Each component is assigned a maximum numerical value (risk points), with the highest number of points indicating the lowest potential risk for that component and the lowest number (0) indicating the highest potential risk. Overall, a financial risk rating of 0.0% to 24.5% indicated a very high risk; 25.0% to 29.9% high risk; 30.0% to 34.9% moderate risk; 35.0% to 39.9% low risk; and 40.0% or more very low risk. Once again, however, a poor financial risk rating can be compensated for by a better political and/or economic risk rating (ICRG, 2013). Joeveer (2013) suggests that macroeconomic conditions may affect the leverage through the fact that they proxy the growth opportunities in the overall economy. The knowledge of the link between business cycle fluctuations and firm performance is important in order to evaluate firm growth. For instance, GDP growth is considered as a macro determinant of bank performance and allows for controlling business cycle fluctuations. Albertazzi and Gambacorta (2009) asserts that bad economic conditions can worsen the quality of the loan portfolio, generating credit losses, which eventually reduce banks' profits. Banks bid more for deposits during a financial crisis, which could lower profitability. Therefore we added also financial risk index the models. To our knowledge, there are no studies on firm growth that consider financial risk as a determinant of firm growth and this aspect is, we believe, one of the relevant contributions of our paper. Lastly, we analyze the influence of financial risk on firm growth using the financial risk index from ICRG. We expected that there is a positive sign between ICRG financial risk index and firm growth because each component is assigned a maximum numerical value (risk points), with the highest number of points indicating the lowest potential risk for that component and the lowest number (0) indicating the highest potential risk.

3.2. Data

This paper examines relationship between corruption and firms' growth. To estimate the relationship between firm growth and corruption, we analyze a sample of 41 firms from manufacturing firms in Turkey, covering the period from 2008 to 2011 by using static panel techniques. We had a balanced panel of 156 samples. The all data are yearly basis. Firm specific

data comes from the Public Disclosure Platform (KAP) and Istanbul Stock Exchange (BIST) in Turkey. Financial risk index data comes from ICRG and CPI obtained by Transparency International (TI).

4. RESEARCH FINDINGS AND DISCUSSION

Table 1 shows descriptive statistics of all variables. The two measures of profitability not differ during the entire period 2008–2011. During the entire period, the mean value of, ROA and ROE are -0.012 and -0.004, respectively. As can be seen from Table 1; we get similar pictures for firm size from the two alternative measures. SIZE1 variable is a value between "6.38"and "9.44". SIZE2 variable is a value between "4.58" and "9,73". Table 1 provides financial risk rating is 32,75, meaning that Turkey has a moderate financial risk level. Additionally, Turkey is a country with a high level of corruption (4,4).

Table- 1. Descriptive statistics

Variable	Observation	Mean	Std. Dev.	Minimum	Maximum
GROWTH	159	0.02106	0.10221	-0.20838	0.53102
ROA	156	-0.01283	0.37439	-4.45230	0.26849
ROE	156	-0.00471	0.28613	1.76969	-0.4533
SIZE1	159	8.16537	0.72683	6.38869	9.44772
SIZE2	158	8.03486	0.83486	4.58463	9.73684
LEV	159	1.39510	2.07969	0.06800	15.8307
LIQ	159	2.12482	1.78662	0.00483	10.3574
FR	164	32.75	2.08301	29.5	35
CPI	164	4.4	0.14184	4.2	4.6

Table 2 reports the correlation coefficients between the variables. The two alternative measures of profitability are highly correlated, as the correlation coefficient is 0.786. Among the explanatory variables, SIZE1 is highly correlated with SIZE2 (0,91). Firm growth correlates positively with ROA, ROE, SIZE1, SIZE2, LEV, FR and negatively with LIQ and CPI.

Table- 2.Correlation coefficients between variables

	GROWTH	ROA	ROE	SIZE1	SIZE2	LEV	LIQ	FR	CPI
GROWTH	1.000								
ROA	0.141	1.000							
ROE	0.120	0.786	1.000						
SIZE1	0.073	0.353	0.267	1.000					
SIZE2	0.106	0.425	0.249	0.909	1.000				
LEV	0.193	-0.312	-0.448	-0.267	-0.257	1.000			
LIQ	-0.036	0.385	0.278	0.177	0.176	-0.391	1.000		
FR	0.059	-0.138	-0.077	-0.037	-0.053	-0.058	0.028	1.000	
CPI	-0.148	-0.100	-0.094	-0.025	-0.003	-0.063	0.078	0.490	1.000

Table 3 reports the empirical results from our estimations of firm growth, modeled by Equation 1 (eq. 1). All coefficients on firm-specific variables have expected signs and the results of the entire model (Model 1a, b, c and d) are parallel to a large extent. Hausman test is tested the H0 hypothesis (null hypothesis) in the shape of 'random effects estimator is true'. As a result of Hausman test, if the null hypothesis is accepted it means the use of random effects model is applied. As a result of Hausman test, the random effects model was selected in all models.

Table- 3.Random effect model results from estimations of firm growth

GROWTH	Model 1a	Model 1b	Model 1c	Model 1d
ROA	0.0498** (0.0217)		0.1775** (0.0839)	
ROE		0.0867*** (0.0312)		0.0806*** (0.0308)
SIZE1	0.0155 (0.0115)	0.0159 (0.0114)		
SIZE2			0.0128 (0.0110)	0.0172** (0.0095)
LEV	0.0120*** (0.0041)	0.0168*** (0.0044)	0.0132*** (0.0041)	0.0162*** (0.0043)
LIQ	0.0016 (0.0048)	0.0017 (0.0047)	-0.0006 (0.0049)	0.0009 (0.0046)
FR	0.0093** (0.0043)	0.0103** (0.0042)	0.0104** (0.0043)	0.0100** (0.0042)
CPI	-0.1599** (0.0630)	-0.1385** (0.0625)	-0.1536** (0.0629)	-0.1481** (0.0625)
CONSTANT	0.2732 (0.2638)	0.1352 (0.2588)	0.2323 (0.2551)	0.1812 (0.2543)
R ²	0.1407	0.1528	0.1365	0.1400
Wald Test	23.48 [0.0006]	26.37 [0.0002]	23.59 [0.0006]	26.24 [0.0002]
Hausman Test	6.45 [0.3745]	7.92 [0.2437]	5.60 [0.4691]	4.10 [0.6626]
No of observations	156	156	155	155
Number of firms	41	41	41	41

Note: *, **, *** show statistical significances at the 10%, 5%, 1% levels, respectively. Values in parentheses are standard errors, the values in brackets refers to the level of significance.

ROA and ROE, the two alternative measures of probability, variables are statistically significant in all the models. The results show that firm growth is significantly and positively associated with firm probability. This finding is consistent with the Fitter growth theory was presented by [Alchian \(1950\)](#) suggest that the profitable firms grow and survive in the market while the other firms exit due to poor performance. Thus, it can be said Fitter growth theory to be true for the Turkish manufacturing firms in the sample. This finding is also consistent with the [Delmar et al. \(2013\)](#) arrest that more profitable firms may have higher potential to grow, since they have already shown a greater fit with the environment and may be are able to fund future competitive

actions with their own cash flow and Mukhopadhyay and AmirKhalkhali (2010) posit that profit provides the funds for growth. Empirically, this finding is consistent with the previous empirical evidence (e.g.(Serrasqueiro, 2009; Coad, 2010; Jang and Park, 2011; Mudambi and Swift, 2011; Kouser *et al.*, 2012; Delmar *et al.*, 2013).

SIZE1 and SIZE2 have positive signs in all growth regressions, but not significant statistically, except for Model 1d. This finding is consistent with Gibrat (1931) *the Law of Proportionate Effect* implies that with a random growth process, the expected growth rate is independent of a firm's size and other identifiable firm and industry characteristics. This result confirms that firm size has no systematic effect on the rate of firm growth. This suggests that, although the actual rate of firm growth is stochastic, the expected growth rate is the same across all sizes of firms (Nakano and Kim, 2011). The results show that small firms rapidly don't grow than large firms because small firms struggle to achieve economies of scale. Our finding is not consistent with recent empirical evidence claiming that there is an inverse relationship between firm growth and firm size (Mudambi and Swift, 2011; Garcia-Manjon and Romero-Merino, 2012; Delmar *et al.*, 2013). Our finding is consistent with previous empirical evidence (Ijiri and Simon, 1974; Vining, 1976; Chesher, 1979; AmirKhalkhali and Mukhopadhyay, 1993; Almus and Nerlinger, 2000; Audretsch *et al.*, 2004).

The leverage has positive signs in all growth regressions. The positive influence of leverage suggests that an increase in firm leverage level brings about an increase in firm growth. Hurdle (1974) reported that leverage positively influences profitability. Debt could yield a disciplinary effect, as stated in the free cash flow hypothesis (Jensen, 1986). Firms with high debt leverage can also decrease wasteful investment opportunities and increase firm performance, suggesting a positive relationship between debt leverage and firm growth. The effect of leverage on firm growth is positive because debt could yield a disciplinary effect, as stated in the free cash flow hypothesis and firms with high debt leverage can also decrease wasteful investment opportunities. Thus, it can be said that industrial companies from Turkey in the sample reach an optimal capital structure, efficient investment areas in which they invest and benefit from the positive impact of leverage. The coefficient on liquidity is positive and statistically insignificant meaning that industry companies from Turkey don't reach an optimal working capital.

Financial risk index from ICRG variable is statistically positive significant in all the models. The result shows that as expected, there is a negative relationship between financial risk rating and firm growth because each component is assigned a maximum numerical value (risk points), with the highest number of points indicating the lowest potential risk for that component and the lowest number (0) indicating the highest potential risk. The overall aim of the financial risk rating is to provide a means of assessing a country's ability to pay its way. In essence, this requires a system of measuring a country's ability to finance its official, commercial, and trade debt obligations. This finding is consistent with Albertazzi and Gambacorta (2009) asserts that bad economic conditions can worsen the quality of the loan portfolio, generating credit losses, which eventually reduce

banks' profits and banks bid more for deposits during a financial crisis, which could lower profitability.

The corruption has negative signs in all growth regressions. This shows that there is a positive relationship between corruption level and firm growth because The Corruption Perceptions Index scores countries on a scale from 0 (highly corrupt) to 100 (very clean), meaning the higher score of a country shows corruption is low in this country. Some studies have supported the hypothesis that corruption can speed up the wheels of commerce and have a positive impact on firm development, by giving the possibility to overcome bureaucratic barriers and surpass timely processes (Wei, 1998). This finding consistent with the following studies: Kaufmann and Wei (1999) find a positive correlation in the tendency of firms to pay bribes and the time that is wasted on bureaucratic procedures. In some cases, firms engage in corrupt practices in an attempt to promote their short-term growth by facilitating transactions in the bureaucratic process. Ades and Di Tella (1999) show that higher corruption occurs in economies with trade barriers, where domestic businesses are less exposed to global competition, or where there are only few dominant businesses. Svensson (2003) suggest that though corruption deters economic growth at the macro-level, bribe payments correlate positively with a cross-section firm growth in Uganda. This is also consistent with Wang and You (2012) posit that the "good corruption" components are used as "speed money", which could promote firm growth by overcoming the less efficient regulations. It can be supported that corruption could increase economic development, mainly because illegal practices and payments as 'speed money' could surpass bureaucratic delays; the acceptance of bribes in government employees could work as an incentive and increase their efficiency and because corruption is possibly the price people are forced to pay as a result of market failures (Acemoglu and Verdier, 2000).

5. CONCLUSIONS

This paper contributes to the limited literature on the link between corruption and firm growth in a single country, Turkey. We focus on the study of the effect of corruption on firm growth. To estimate the relationship between firm growth and corruption, we analyze a sample of 41 firms from manufacturing firms in Turkey, covering the period from 2008 to 2011. We use static panel techniques to analyze the relationship between firm growth and corruption in this paper. The study shows that the effect of corruption level, profitability and financial leverage on the growth of the firms is significantly positive in all case, but financial risk rating is negative. We found also firm size and liquidity has both negative signs in growth regressions, but not significant statistically.

We find specially a significantly positive relation between the growth of private firms and corruption level. This means that corruption plays an important role in determining the firm growth. This is consistent with Wang and You (2012) posit that the "good corruption" components are used as "speed money", which could promote firm growth by overcoming the less efficient regulations. It can be supported that corruption could increase economic development, mainly because illegal practices and payments as 'speed money' could surpass bureaucratic delays; the

acceptance of bribes in government employees could work as an incentive and increase their efficiency and because corruption is possibly the price people are forced to pay as a result of market failures.

We provide evidence that there is positive relationship between profitability and firm growth. This finding is consistent with the Fitter growth theory was presented by [Alchian \(1950\)](#) that the profitable firms grow and survive in the market while the other firms exit due to poor performance. We document that there is a negative relationship between financial risk rating and firm growth. The overall aim of the financial risk rating is to provide a means of assessing a country's ability to pay its way. In essence, this requires a system of measuring a country's ability to finance its official, commercial, and trade debt obligations. This finding is consistent with [Albertazzi and Gambacorta \(2009\)](#) asserts that bad economic conditions can worsen the quality of the loan portfolio, generating credit losses, which eventually reduce banks' profits and banks bid more for deposits during a financial crisis, which could lower profitability.

The results of this study provide managerial implications for industrial companies from Turkey. The results indicated that profitable firms could grow. If you want to grow your company, as a manager, profitability should increase, should reach economies of scale, an optimal capital structure level and reach the optimal level of working capital level due to these firms grow faster than other companies. We suggest that policy-makers improve in public governance quality and the leveling of the playing field for firms in all business sectors to reduce corruption level because firms tend to pay bribes and the time that is wasted on bureaucratic procedures and engage in corrupt practices in an attempt to promote their short-term growth by facilitating transactions in the bureaucratic process. Additionally, firms posit corruption as "speed money", which could promote firm growth by overcoming the less efficient regulations. Overall, it can be supported that corruption could increase economic development, mainly because illegal practices and payments as 'speed money' could surpass bureaucratic delays; the acceptance of bribes in government employees could work as an incentive and increase their efficiency and because corruption is possibly the price people are forced to pay as a result of market failures. Future studies could investigate the interrelationship using other various growth and profit measurements. It is also necessary to further examine the relationships among growth, cost reduction, efficiency gain and profits in the banking industry and tourism industries due to its differences from the manufacturing industry.

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