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### **IMPACTS OF CORPORATE GOVERNANCE ON FIRM PERFORMANCE: TURKEY CASE WITH A PANEL DATA ANALYSIS**

**Cahit Yilmaz**

Corresponding Author: Okan University, Turkey. Email: cahityilmaz1@gmail.com

**Ali Hakan Buyuklu**

Yildiz Technical University, Turkey. Email: hbuyuklu@yildiz.edu.tr

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#### **Abstract**

There has been increasing attention all over the world on corporate governance issues after experiencing some financial crises and corporation scandals. It is assumed that the investors search for emerging economies to diversify their investment portfolios and maximize their returns is considering corporate governance applications. Investors are also concerned about governance factors to minimize their risks. In this study, we examine the impact of corporate governance variables on firms' financial performance in Turkey. The relationship between ownership structures, board structures and financial performances are tested. Influence of corporate governance variables, board size, share of independent board members, foreign investors, leverage ratio on firms' financial performance "return on assets" are utilized on firms traded in Turkey's stock exchange BIST 100. This research concludes that corporate governance variables influence firms' performances. Shares of independent board members and leverage have negative influences while foreign ownership has a positive influence on firms' financial performances.

**Keywords:** Corporate Governance, Financial Performance, Board Structure, Ownership Structure, Turkey

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#### **1. Introduction**

The concept of corporate governance has been important all over the world after the extension of financial markets (globalization). It is believed that international capital considers good corporate governance practices in the countries before investing in those countries.

In this research we argue corporate governance and its effect on firm performance. Within the last 40 years, corporate governance gained importance in academic world, then business world and finally on overall economy. Especially after major financial crises such as Enron and 2008 subprime crises the importance of corporate governance applications increased. It is now believed that, good corporate governance practices enhance investors' confidence for investment decisions.

Corporate governance issue has traditionally been associated with the "principal-agent" or the "agency" problem. A "principal-agent" relationship arises when the person who owns a firm is not the same person who manages or controls (Maher and Andersson, 1999). That issue directs us to concentrate on the ownership and board structure.

There are different definitions for three different groups (Alp and Kilic, 2014) such as (i) definitions that arrange relations between the firm and the share (or stake) holders, (ii) definitions that predicate on which outcomes intended to reach and (iii) definitions that base on management concept which rely on certain objectives and principles. Based on these classifications we might define corporate governance as a set of relationships between a company's management, its board, its shareholders and stakeholders.

In the OECD Principles of Corporate Governance Report which was first published in 2004 (OECD, 2015, p.13), it is stated that "the corporate governance framework should promote transparent and efficient markets, be consistent with the rule of law and clearly state the division of responsibilities among different supervisory, regulatory and enforcement authorities". In the same OECD report, CG is defined as "[...] a set of relationships between a company's management, its board, its shareholders and other stakeholders. Corporate governance also provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined," (OECD, 2015, p.9). The principles recognize the interests of employees and other stakeholders and their important role in contributing to the long-term success and performance of the company.

In his study Bairathi (2009, p.753) defines corporate governance as "it is not just corporate management; it is something much broader to include a fair, efficient and transparent administration to meet certain well-defined objectives. It is a system of structuring, operating and controlling a company with a view to achieve long term strategic goals to satisfy shareholders, creditors, employees, customers and suppliers, and complying with the legal and regulatory requirements, apart from meeting environmental and local community needs"

There are different corporate governance systems exist across countries that mainly involve the ownership and control of the firms. In some countries, outside managers are admired due to their strong effect on management. Adversely, in some countries concentrated ownership or control is the main characteristic of the system. According to the characteristics of the countries one of these systems take importance and therefore research on the effect of corporate governance in different countries give divergent results. Therefore, no single model of corporate governance exist (OECD, 2015) and each country based on their culture attempts to find the most suitable governance system.

Turkey has been dealing with various corporate government applications since the beginning of the 2000s. Capital Market Board published a CG code in 2003 and revised it in 2005. A Corporate Governance index was established in 2007 and currently there are now more than 50 companies in BIST CG index. New commercial code of Turkey was launched in 2011 and the related rules of corporate governance come into power in 2012. There are four major principles defined in the code: transparency, fairness, accountability and responsibility.

We searched in this study to understand if corporate governance has effects on firm financial performance by utilizing BIST 100 and corporate governance Index firms of Istanbul Stock Exchange, Turkey. The main goal of our research is to understand whether corporate governance effects firm performances while our secondary goal is to provide a better framework for better corporate governance. That goal in mind, we used a panel data analysis with 8 independent variables. In our model we used return on assets (ROA), ebitda, financial leverage (total debt/total assets) and market value to book value (PBV) as dependent variables. As for independent variables we used asset size, net sales, ebitda, leverage, board size (number of board members), number of independent members of board, share of foreign investors and floating rate.

Within the first three section of this research paper we defined corporate governance and reviewed the related literature. Section four and five of this paper provide data and analytical framework for the panel data regression model and empirical results are discussed. Section six concludes our research.

## **2. Research Objectives**

The objective of this research is to study the impact of corporate governance variables: board size (number of board of directors), board independence (number of independent members of

board), foreign ownership, floating rate and firm's profitability ratios, Return on Assets (ROA), ebitda, financial ratios, leverage, net sales and asset size.

We aim to understand the effect of corporate governance on firm financial performance of BIST 100 and CG index companies of BIST, Turkey. We attempt to understand the effects of ownership structure and board structure on financial performances of those firms.

Our primary research question is as follows: Is there any relationship between the board structure, ownership structure (corporate governance) and firms' financial performances for BIST 100 and CG index companies in Turkey.

### **3. Literature Review**

Corporate governance theory proposes that there is a positive relation between corporate governance and firm performance. However, different results were observed in empirical studies since corporate governance practices varies in different countries and related business cultures are different (Turan and Bayyurt, 2013).

Increasing uncertainties and accordingly increasing risks following financial crises of 1997-98 Asia and 2008 US, inspired researchers, businessmen and governments for further studies on developing and formulating corporate governance practices. The Organization of Economic Corporation and Development (OECD) issued its OECD principle of corporate governance in 1999.

Since the theoretical study of Berle and Means (1932) which argues for a positive correlation between the ownership concentration and performances, there has not been any empirical study conducted until the seventies. Jensen and Meckling (1976) discussed the relationships between managerial ownership and performances and they found positive relationship as opposed to Berle and Means (1932).

Since the early 80's, there have been several papers empirically investigated the relationship between corporate governance practices and firm performance. Different results were obtained (see Drobetz *et al.* 2003; Gompers *et al.* 2003; Klapper and Love, 2002; Larcker *et al.* 2007; Brown and Caylor, 2006; Demsetz, 1983). Drobetz *et al.* (2003) in their research found a strong positive relation between corporate governance quality and firm value. On the contrary, Demsetz (1983) and Demsetz and Vilallonga (2001) observed no relationship between corporate governance (ownership structure) and firm performance.

As some of the studies suggest, we believe that country specific features (business culture of the country) may be the important reason behind the success or failure of corporate government applications (Black, 2001; Durnev and Kim, 2005; Klapper and Love, 2004).

Theoretically, it is assumed that good corporate governance should help local companies to gain access to foreign capital and foreign companies and also loan facilities. La Porta *et al.* (1999, p.5) reported in their study that "[...] firms in emerging economies (compared with their counterparts in developed countries) are discounted in financial markets because of weak governance"

There are different ways of measuring financial performance and its relations with corporate governance practices. The most preferred measures could be categorized into two groups which are accounting based measures such as ROA, ROE, EBITDA ext. and market based measures such as Tobins Q, pbv ext. (Sengür, 2011)

Many researchers found positive relations between ROA, ROE and corporate governance (Gürbüz *et al.* 2010; Garay and Gonzales, 2008). In their early research Varis *et al.* (2001) found positive relation between corporate governance and firms' profitability by using Istanbul Stock Exchange (ISE) data. In another research which investigated the relations between corporate governance and firm performance by using asset turnover, ROA and ROE they also found positive relations (Karamustafa *et al.* 2009). They compared the firms prior to and after corporate governance index performance. On the contrary, Eyuboglu (2011) found no difference between monthly average returns after and before entering into the ISE index of corporate governance of companies.

### 3.1. Structure of Board: Board Size and Independent Directors

There is another controversial issue involving board sizes and independent members as being one of the main factors of the firms' success. The board controls the firm on behalf of shareholders and the board size is expected to affect firm's performance. What is the appropriate size of a successful board? Also the board size may cause agency problems. Several researches conducted found inverse relationship between the board size and firm performance. Some researchers argue that larger boards may be less effective than smaller boards. A board of limited size is expected to be more performing than a bigger one due to better communication and decision making process. On the contrary, some researchers also argue that small boards may lack the advantage of providing expert advices in larger numbers.

Lipton and Lorsh (1992) in their early study pointed out that small board would be more effective due to their decision mechanism. Yermack (1996) also found negative relationship between the board size and performance in his empirical research in which he observed 452 US firms during 1984-1991. Bennedsen *et al.* (2008) examined 6,850 Danish firms for boards with 6 and more members and found no positive relationship between board sizes and firm performances (ROA). Ammari *et al.* (2014) examined board structure (board size, independent members) of 40 French firms listed on the SBF 120 during the periods of 2002-2009. They found a strong negative relationship between board sizes and performances. Zakaria *et al.* (2014) analyzed Malaysian listed trading and services sector by using panel data regression model. They found that board size positively influences firm performance. They also found that the effects of board independent members are insignificant on firm performance.

Fernandez (2014) in his recent study also found a strong negative relation between performance and board size. He analyzed the sample of firms that constitute the EUROSTOXX50 Index. He used ROA, ROE and Tobin's Q as performance indicators.

Obradovich and Gill (2013) stated in their research that larger board size negatively impacts the value of American firms however financial leverage and firm size positively impact the value of American firms.

Yammeesri and Herath (2010) raised doubts about the ability of non-executive directors in monitoring firm management and found no conclusive evidence in their capabilities either in increasing or decreasing the corporate performance. In the case of Thai firms, no evidence was found to confirm that the existence of independent directors is significantly related to firm value.

In relation to independent board members, Mak and Kusnadi (2005) stated that increasing number of independent members on the board helps in enhancing firms' value. It is believed that independent board members are an important component of good corporate governance.

The question for the independent members is "whether independent members can add value to the firm or not". Independent members are assumed to add more value to the firm. Therefore corporate governance suggests that increase in the number of independent members should increase firm performance (Ammari *et al.* 2014). Nicholson and Kiel (2007) argued that inside directors better understand the business than outside directors and so can make better decisions. Rashid *et al.* (2010) argued that there is a greater information asymmetry between inside and outside independent directors due to the lack of day to day inside knowledge that would effectively limit the ability of outside independent directors in controlling the firm due to lack of support of the inside directors.

John and Senbet (1998) in their article argued that boards of directors become more independent as the proportion of independent members (outside managers) increases. As opposed to this argument some researchers such as Fosberg (1989) who found no relation between the proportion of independent members and various performance measures. Bhagat and Black (2002) also found no relation between proportion of independent members of board and ROA, asset turnover and stock returns.

Andersen *et al.* (2003) showed that the cost of debt is lower for larger boards, presumably because creditors view these firms as having more effective monitors of their financial accounting process.

There are other opposite assessments on the relations between board size and firm performance as well. According to one assessment, if the size of board is smaller it provides efficiency for quick and right decisions that positively affects firm performance (see Jensen, 1993; Yermack, 1996). On the opposite side, if the size of board is bigger anonymous decisions will be wiser and more effective (Coles *et al.* 2008).

**H1:** There is a negative relationship between board size and firm performance.

**H2:** There is a positive relationship between board independence and firm performance

### **3.2. Ownership Structure**

Salami (2011) investigated ownership structure and its effect on company profitability. He used panel data regression models in his study and concluded that firms with low ownership concentration showed low firm profitability. This result was supported by the findings of Sorensen (2007) who examined the effects of ownership dispersion on cost efficiency. Pagano *et al.* (1998) in their study found an insignificant negative relationship between ownership structure and firm performance by using panel data regression analysis.

Foreign ownership is given importance in corporate governance. A foreign ownership of a company is assumed to enhance firm's reputation and firm's value. The foreign ownership is expected to give more importance to monitoring and transparency. Additionally, a company with foreign owners is assumed to have more successful financial risk management.

Dwivedi and Jain (2005) in their research for India concluded that firms with high foreign ownership structure have high market value than the others.

**H3:** There is a positive relationship between foreign ownership and firm performance.

### **3.3. Leverage**

We employed leverage ratio in our study because the firms need borrowed money to invest in securities and to expand over and above the money provided by shareholders. The effect of financial leverage differs from country to country due to different economical structures.

Weill (2003) in his study found some mixed empirical evidence on the relationship between leverage and corporate performance. For Italian firms he found negative relationship oppositely he found positive relationship for firms in France and Germany.

Majumdar and Chhibber (1999) tested the relationship between leverage and corporate performance on a sample of Indian companies found negative relationship between leverage and corporate performance.

Dessi and Robertson (2003) found that there existed a positive relationship between leverage and financial performance.

It is assumed that, good governed companies should have easier access to outside financial sources than the others. Hence, if they need loans for working capital or investments they can easily raise the amount. Therefore, we should expect positive relationship between leverage and corporate governance. However, it should be considered that higher debt ratio negatively impacts firm performance and firm value. Thus, highly leveraged firms must show better performance, otherwise their managers would be replaced.

We employed a single measurement to analyze the effect of leverage on firm performance which is leverage ratio (total debt to total assets).

**H4:** There is a positive relationship between leverage and firm performance

### **3.4. Corporate Governance Literature in Turkey**

Although the corporate governance implications are relatively new in Turkey there are already several and important studies on the issue.

Gursoy and Aydogan (1999) in their study observed that increase in ownership concentration in listed firms increase their financial performance by using panel data analysis. Citak (2007) in her study found positive relationship between ownership structure and price to book value ratio.

Aydin *et al.* (2007) investigated the performance of foreign owned firms listed on Istanbul stock exchange in their study. They used operating profit margin, ROA and ROE as dependent variables for the period 2003-2004. The results reveal that the firms with foreign ownership operating in Turkey perform better than the domestic ownership in respect to ROA.

Yildirim and Demireli (2009) concluded in their study that increase in the ownership concentration only increased Tobin's q and conversely ROA, net profit and ROE decreased.

Gurbuz and Aybars (2010) searched the financial performance of the companies with foreign ownership listed on the Istanbul Stock Exchange. They used panel data analysis with the sample of 205 non-financial firms for the period of 2005-2007. They concluded that foreign ownership improves firm financial performance in Turkey.

Mandaci and Gumus (2010) found conflicting results on the effects of managerial ownership and ownership concentration on firm performance.

Bayrakdaroglu (2010) used the figures of Istanbul Stock Exchange firms to examine the effect of ownership structure on firm performance. He used Tobin's q, ROA and ROE as dependent variables while ownership structure, floating rate, foreign ownership and managerial ownership were taken as independent variables. Panel data regression analysis was used. He concluded that ownership concentration and floating rate effects financial performance. On the other hand he found that foreign ownership and managerial ownership variables have no effect on financial performance as opposed to expectations.

Unlu *et al.* (2011) investigated the relationship between managerial ownership and firm performance of listed ISE Turkish firms for the period 2004-2008. They used panel data analysis. They found no significant relationship between managerial ownership and firm performance with respect to Tobin's q.

Karaca and Eksi (2012) investigated the relationship between ownership structure and corporate performance of 50 companies listed in manufacturing sector on the Istanbul Stock Exchange during the 2005-2008 period. They used ownership concentration as corporate governance factor. As result they found a positive relationship between ownership and firm performance.

Akcaay and Aygun (2014) investigated relationship between ownership structure and firm performance. In the study they used two measurements: ROE and Tobin's q. Their research was conducted for the period 2009-2010 and data for the 117 Istanbul Stock Exchange companies was utilized. As a result, they found positive and significant relationship between the ownership structure and Tobin's q. Conversely, they found no significant relation between ROE and ownership structure.

#### **4. Data and Variables**

In this research we used data on firms listed in Istanbul Stock Exchange (BIST), Turkey. We employed BIST 100 firms and CG index companies which contains 50 firms. We removed banks, holdings and financial firms from the list due to their different asset structure and their operational readiness to corporate governance applications.

Additionally we also removed some firms from the list to prevent double counting since some of those firms were in both list. Thus, a sample of 92 companies was selected from a total of 150 companies to study. The following was used respectively for independent variables; board size (number of board members), board independence (number of independent board members), share of foreign investors, floating rate, EBITDA, net sales, asset size, leverage ratio and for dependent variables Return on Assets (ROA), Leverage, EBITDA and price to book value (PBV).

We used data for the period 2007-2013. Data mainly collected from BIST sources via Finnet data publishing company's facilities. Some of the data have been collected from the firms' audit reports.

## 5. Methodology, Empirical Results and Conclusion

The panel data analysis has been used in this study to conduct the analysis of many firms overtime by combining time-series and cross-sectional information. We searched the relationship between firms' financial performance and corporate governance variables.

Hypothesis: Corporate governance has a significant impact on firm's financial performance.

In literature, Tobin's q, ROA, ROE are considered as performance indicators. In our study we employed ROA, EBITDA, Leverage (LEV) and price to book value (PBV) as dependent variables. ROA, EBITDA and LEV were taken as accounting base while PBV was taken as market base performance measurement.

We set the regression models as follows:

$$\begin{aligned} \text{ROA} &= \beta_0 + \beta_1 \text{orate} + \beta_2 \text{netsales} + \beta_3 \text{ebitda} + \beta_4 \text{lev} + \beta_5 \text{bs} + \beta_6 \text{indpbs} + \beta_7 \text{assets} + \beta_8 \text{forinv} + u \\ \text{LEV} &= \beta_0 + \beta_1 \text{orate} + \beta_2 \text{netsales} + \beta_3 \text{ebitda} + \beta_4 \text{bs} + \beta_5 \text{indpbs} + \beta_6 \text{assets} + \beta_7 \text{forinv} + u \\ \text{PBV} &= \beta_0 + \beta_1 \text{orate} + \beta_2 \text{netsales} + \beta_3 \text{ebitda} + \beta_4 \text{lev} + \beta_5 \text{bs} + \beta_6 \text{indpbs} + \beta_7 \text{assets} + \beta_8 \text{forinv} + u \\ \text{EBITDA} &= \beta_0 + \beta_1 \text{orate} + \beta_2 \text{netsales} + \beta_3 \text{lev} + \beta_4 \text{bs} + \beta_5 \text{indpbs} + \beta_6 \text{assets} + \beta_7 \text{forinv} + u \end{aligned}$$

Where the dependent variables are:

EBITDA: (log) Earnings before interest, tax depreciation and amortization

ROA: Net income / total assets

PBV: Price / book value

Leverage (LEV): Total debt / total assets

The independent (explanatory) variables are:

forinv: The percentage of shares that are owned by foreigners. A dummy variable equal to 1 if foreigners own 10% or more of the shares of the company and otherwise equal to zero

Orate: Floating rate

Board size (bs - nbmYpers): Number of board members / number of executive staff

Board Independence (indpbs): Number of independent board members / numbers of executive staff

LEV and EBITDA were also used as explanatory variables. The control variables are "Assets size (assets): The log of net assets" and "Net sales: The log of net sales".

We set up model with age and foreign ownership variables in addition to the above given variables. Unit root test results indicate that age and forinv contains unit root and they are not stationary. Thus these variables are excluded from the analysis. In order to use foreign ownership ratio as a variable, forinv is recoded as dummy variable. A firm is considered to have foreign share if the foreign ownership ratio is above 10%.

Leverage is taken as a performance indicator and at the same time as explanatory variable. We assumed that leverage would be a good variable to show the effect of corporate governance during the financial crises. Therefore, we used the data from the period of 2007-2013 which overlaps the 2008-2009 financial crisis years.

This study is somewhat different than the earlier studies conducted. There are a few studies in Turkey in which used panel data analysis (see Bayrakdaroglu, 2010; Gurbuz and Aybars, 2010; Gursoy and Aydogan, 2009; Unlu *et al.* 2011) in searching the effect of corporate governance on firm performance and they generally used shorter time period. In those studies they employed ownership concentration, managerial ownership and foreign ownership. Only

Gurbuz and Aybars (2010) used EBITDA as dependent variable but they did not use leverage and pbv.

### 5.1. Panel Data Regression Analysis and Findings

Corporate governance data consist of 92 firms over the period of 2007-2013. Since data have both cross-sectional dimension and time dimension panel regression techniques are preferred to model the relationship between the dependent variables and control variables.

Panel regression techniques are superior to classical regression techniques as they consider both the time dimension and cross-sectional dimension. Applying classical regression methods to a panel data may yield to biased estimates due to heterogeneity of variables. We also used robust estimation methods to avoid the effects of serial correlation and heteroscedasticity.

**Table 1. Correlation matrix for variables**

	roa	lev	pbv	ln_ebitda	orate	ln_netsales	nbmYpers	indpbs	ln_assets	dforinv
roa	1									
lev	-0.1933	1								
pbv	0.3219	0.1728	1							
ln_ebitda	0.3611	0.2892	0.1585	1						
orate	-0.0384	-0.2665	-0.0429	-0.2593	1					
ln_netsales	0.0976	0.4847	0.1336	0.8203	-0.2025	1				
nbmYpers	-0.147	-0.3359	-0.1806	-0.5055	0.2499	-0.5642	1			
indpbs	-0.1848	-0.3042	-0.2022	-0.494	0.3012	-0.4975	0.9563	1		
ln_assets	-0.0627	0.3936	0.0247	0.8216	-0.2236	0.8264	-0.4159	-0.382	1	
d_forinv	0.0178	0.2037	0.0703	0.1994	-0.3453	0.2427	-0.1842	-0.23	0.1509	1

General relationships between variables can be observed from the correlation matrix (Table 1). A high positive correlation is observed between net sales, ebitda and assets, indpbs (board independence) and nbmYpers (board size).

Panel regression results for Model 1 to Model 4 are given in Tables 2a-4a. Based on the Hausman test results, while random effect regression is preferred in Model 1, fixed effect regressions are preferred in Model 2, 3 and 4.

In Model 1 possible determinants for ROA is investigated (Table 2a). Random effect regression is preferred as Hausman test suggests ( $X^2=9.470$ ,  $p>0.05$ ).  $r^2$  is found 0.542 which indicates a good explanation ratio for the dependent variables. Wald test indicates model is significant ( $X^2 =519.130$ ,  $p=0.000$ ). Regression result suggests that lev, indpbs and assets are inversely linked with ROA, while netsales and ebitda are linked positively. No significant effect is found between ROA and orate, dforinv and nbmYpers (board size).

On the other hand Durbin–Watson’s (1.276) and Baltagi–Wu’s (1.849) serial correlation test results suggest there is serial correlation problem in the model. Also Levene-Brown-Forsythe’ test for heteroscedasticity suggest that such a problem exists ( $F=7.191$ ,  $p=0.000$ ). In case of serial correlation and heteroscedasticity, robust estimators can be preferred. In random effect regression, quasi likelihood estimator is preferred and results for this estimation are given in Table 2b. Robust estimation results suggest that while lev and assets are negatively significant on ROA, only ebitda is found positively significant. Two variables which are found significant in non-robust estimates are found non-significant in robust estimation namely net sales and indpbs. No new variables appeared to be significant in robust estimates. Overall significance of the model is confirmed with the Wald test ( $X^2=142.950$ ,  $p=0.000$ ).

<b>Table 2a. Random effect panel regression dependent variable ROA (Model 1)</b>				
	Coef.	Std. Err.	z	P>z
orate	-0.791	2.108	-0.380	0.707
In_netsales	0.882	0.467	1.890	0.059
In_ebitda	4.660	0.262	17.800	0.000
lev	-8.264	1.556	-5.310	0.000
nbmYpers (board size)	6.887	4.513	1.530	0.127
indpbs	-23.265	14.573	-1.600	0.110
In_assets	-5.478	0.442	-12.400	0.000
dforinv	-1.028	1.082	-0.950	0.342
_cons	24.391	2.536	9.620	0.000
Wald chi2	519.130			0.000
R2	0.542			
Hausman	9.470			0.304
Durbin-Watson (Otocorrelation)	1.276			
Bhargara, Franzini Narendranathan ve Baltagi - Wu (Otocorrelation)	1.849			
Corrected Lagrange Multiplier test (Otocorrelation)	39.940			0.000
Levene - Brown ve Forsythe (Heteroscedastisity)	7.191			0.000
<b>Table 2b. Random effect panel regression with quasi least squares dependent variable ROA</b>				
	Coef.	Std. Err.	z	P>z
orate	-0.086	2.144	-0.040	0.968
In_netsales	0.922	0.784	1.180	0.240
In_ebitda	4.534	0.921	4.920	0.000
lev	-7.444	3.104	-2.400	0.016
nbmYpers (board size)	9.408	6.650	1.410	0.157
indpbs	-30.485	20.541	-1.480	0.138
In_assets	-5.228	0.611	-8.560	0.000
d_forinv	-0.844	0.935	-0.900	0.367
_cons	22.127	4.046	5.470	0.000
Wald chi2	142.950			0.000

Overall, though they are not statistically significant, a negative relationship between board size, board Independence and ROA was found (see Table 2); that is, larger board size and larger independent members negatively impacts the profit of firms. Asset size is significant but negatively affects ROA. Fernandez (2014) in his article supported our result. He found in his study that there existed a strong and negative relation between firm size and financial performance. He concludes that large company size depresses financial performance.

Empirical studies of publicly traded firms have shown a negative relationship between board size and firm performance. Hermalin and Weisbach (2003, p.20) concluded that “[...] board size and firm value are negatively correlated”. Bennedsen *et al.* (2008) after analyzing several researches on several countries stated that “[...] the negative board size effect exist for publicly traded firms [...] thus with a few exception, the negative board size effect is well established for publicly held firms across countries,” (p.1099). Zakaria *et al.* (2014) examined 73 listed firms in Malaysia for the period 2005-2010 by using panel data analysis. As result they found that board size positively influences firm performance while board independence and foreign board members have no significant effect. Similarly Lipton and Lorsch (1992) argued that large corporate boards may be less efficient due to difficulties in solving the agency problem among the members of the board.

Additionally, our result suggests that board independence in Turkish firms is not associated with important performance measures. There is no link between board independence and firm performance. This result is consistent with the study of Bhagat and Black (2001). Bhagat and Black (2001) stated in their article that “today’s independent directors

are not independent enough" (p.266). Our result is also consistent with the study of Rashid *et al.* (1999) who examined the influence of the board in the form of representation of outside members on firm economic performance in Bangladesh. They concluded that the independent members cannot add potential value to the firm's economic performance in Bangladesh. On the contrary, some studies such as Kaplan and Reishus (1990) and Beasley (1996) found a positive impact of board with independence members on firm performance.

In Model 2, possible determinants for lev are investigated (Table 3a). Fixed effect regression is preferred as Hausman test suggests ( $X^2=19.08$ ,  $p<0.05$ ).  $r^2$  is found 0.180. F test indicates model is significant ( $F=4.890$ ,  $p=0.000$ ). Regression result suggests that only three variables have effect on lev. Net sales and assets have positive effect on lev and, ebitda has negative effect on lev. Other variables don't have significant effects on lev.

On the other hand Durbin–Watson's (0.950) and Baltagi–Wu's (1.516) serial correlation test results suggest there is serial correlation problem in the model. Also Wald's test statistic for heteroscedasticity suggest that such a problem exists ( $X^2=32421.480$ ,  $p=0.000$ ). In case of serial correlation and heteroscedasticity, robust estimators can be preferred. In fixed effect regression, Driscoll- Kraay estimator is preferred and results for this estimation are given in Table 3b. Robust estimation results suggest that two variables, assets and dforinv positively affect lev. Results for non-robust estimates are different from robust estimates. Overall significance of the model is confirmed with the F test ( $F=1260.570$ ,  $p=0.000$ ). These relationships and the way of signs were consistent with expectations. Dessi and Robertson, (2003) found that there existed a positive relationship between leverage and financial performance.

In Model 3, possible determinants for pbv are investigated (Table 3a). Fixed effect regression is preferred as Hausman test suggests ( $X^2=70.960$ ,  $p<0.05$ ).  $r^2$  is found 0.002 which is weak. F test indicates model is significant ( $F=7.520$ ,  $p=0.000$ ). Regression result suggests that only two variables have effect on pbv. Assets has positive and forinv has negative effect on pbv. Other variables don't have significant effects on pbv.

On the other hand Durbin–Watson's (1.335) and Baltagi–Wu's (1.801) serial correlation test results suggest there is serial correlation problem in the model. Additionally, Wald's test statistic for heteroscedasticity suggest that there is such a problem exists ( $X^2=2.0$ ,  $p=0.000$ ). In case of serial correlation and heteroscedasticity, robust estimators can be preferred. In fixed effect regression, Driscoll-Kraay estimator is preferred and results for this estimation are given in Table 3b. Robust estimation results suggest that three variables, ebitda and assets positively affect pbv and forinv negatively affects pbv. Results for non-robust estimates are different from robust estimates. Overall significance of the model is confirmed with the F test ( $F=99.480$ ,  $p=0.000$ ).

Considering foreign ownership, this result is consistent with the Bayrakdaroglu (2010). In his study he found that foreign ownership has no significant effect on performance, conversely it has negative relations with ROA. In some other previous studies in Turkey (see Aydin *et al.* 2007; Gurbuz and Aybars, 2010) it has been concluded that foreign ownership and firm performance are related. Firms with higher foreign shareholders perform better than local firms. This result is rather different than our findings. Additionally, Gonenc (2006) in his extensive research concluded that ownership concentration is related with pbv positively and significantly. However, he also found that there is no relationship between accounting base performance indicators and ownership concentration which is consistent with our results.

<b>Table 3a. Fixed effect panel regression (Model 2 and 3)</b>								
	Dependent variable lev				Dependent variable pbv			
	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	z	P>z
orate	-0.02379	0.064488	-0.37	0.712	0.649	0.825	0.790	0.432
ln_netsales	0.035121	0.016717	2.1	0.036	0.033	0.215	0.150	0.879
ln_ebitda	-0.016338	0.007131	-2.29	0.022	0.103	0.092	1.120	0.262
lev					0.400	0.595	0.670	0.501
nbmYpers (board size)	-0.278261	0.245554	-1.13	0.258	1.000	3.146	0.320	0.751
Indpbs	1.274145	0.839085	1.52	0.13	-1.591	10.762	-0.150	0.883
ln_assets	0.035045	0.016114	2.17	0.03	0.579	0.207	2.790	0.005
d_forinv	0.070305	0.065305	1.08	0.282	-3.973	0.837	-4.750	0.000
_cons	0.007599	0.101104	0.08	0.94	-2.249	1.293	-1.740	0.083
F	4.890			0.000	7.520			0.000
R2	0.180				0.002			
Hausman	19.08			0.008	70.960			0.000
Durbin-Watson (Otocorrelation)	0.950				1.335			
Bhargara, Franzini Narendranathan and Baltagi - Wu (Otocorrelation)	1.516				1.801			
Wald (Heteroscedastisity)	32421.480			0.000	2.0E+05			
<b>Table 3b. Fixed effect panel regression with Driscoll-Kraay estimator</b>								
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
orate	-0.02379	0.051096	-0.47	0.643	0.649	0.741	0.880	0.383
ln_netsales	0.035121	0.024418	1.44	0.154	0.033	0.105	0.310	0.755
ln_ebitda	-0.016338	0.012699	-1.29	0.202	0.103	0.013	7.750	0.000
lev					0.400	0.452	0.880	0.379
nbmYpers (board size)	-0.278261	0.272029	-1.02	0.309	1.000	0.872	1.150	0.254
Indpbs	1.274145	1.024784	1.24	0.217	-1.591	3.954	-0.400	0.688
ln_assets	0.035045	0.014354	2.44	0.017	0.579	0.258	2.240	0.028
d_forinv	0.070305	0.04064	1.73	0.087	-3.973	1.062	-3.740	0.000
_cons	0.007599	0.048075	0.16	0.875	-2.249	1.623	-1.390	0.169
F	1260.570				99.480			
within R2	0.069				0.115			

<b>Table 4a. Fixed effect panel regression (Model 4)</b>				
	Dependent variable ebitda			
	Coef.	Std. Err.	z	P>z
orate	0.161	0.420	0.380	0.701
ln_netsales	1.174	0.094	12.460	0.000
nbmYpers (board size)	-0.553	1.598	-0.350	0.729
Indpbs	0.113	5.463	0.020	0.983
ln_assets	-0.168	0.105	-1.610	0.109
d_forinv	0.164	0.425	0.390	0.699
_cons	-2.045	0.651	-3.140	0.002
F	9.160			0.000
R2	0.638			
Hausman	46.200			0.000
Durbin-Watson (Otocorrelation)	1.450			
Bhargara, Franzini Narendranathan and Baltagi - Wu (Otocorrelation)	2.132			
Wald (Heteroscedastisity)	4.1E+05			
<b>Table 4b. Fixed effect panel regression with Driscoll-Kraay estimator</b>				
	Coef.	Std. Err.	t	P>t
orate	0.161	0.354	0.460	0.649
ln_netsales	1.174	0.048	24.670	0.000
nbmYpers (board size)	-0.553	0.647	-0.860	0.395
Indpbs	0.113	1.770	0.060	0.949
ln_assets	-0.168	0.052	-3.240	0.002
d_forinv	0.164	0.108	1.520	0.133
_cons	-2.045	0.238	-8.580	0.000
F	386.660			0.000
within R2	0.421			

In Model 4, possible determinants for ebitda are investigated (Table 4a). Fixed effect regression is preferred as Hausman test suggests ( $X^2=46.200$ ,  $p<0.05$ ).  $r^2$  is found 0.638 which indicates a strong explanation power. F test indicates model is significant ( $F=9.160$ ,  $p=0.000$ ). Regression result suggests that only one variable has effect on ebitda. Net sales have positive effect on ebitda. Other variables don't have significant effects on ebitda.

On the other hand Durbin–Watson's (1.450) and Baltagi–Wu's (2.132) serial correlation test results suggest there is serial correlation problem in the model. Additionally, Wald's test statistic for heteroscedasticity suggest that there is such a problem exists ( $X^2=4.1$ ,  $p=0.000$ ). In case of serial correlation and heteroscedasticity, robust estimators can be preferred. In fixed effect regression, Driscoll- Kraay estimator is preferred and results for this estimation are given in Table 4b. Robust estimation results suggest that two variables; assets negatively and net sales positively effects ebitda. Results for non-robust estimates are different from robust estimates. Overall significance of the model is confirmed with the F test ( $F=386.660$ ,  $p=0.000$ ).

## 6. Conclusion

In this study we take ROA, leverage ratio and ebitda to measure accounting performance, pbv to measure firm value and market performance.

According to the panel data analysis, board size has no significant relation to ROA, ebitda, leverage and pbv. Neither limited boards nor larger boards have any affects on corporate governance.

It is generally discussed in corporate governance literature that whether board composition with the independent members may have any positive effects on the firms. In our study board independence is negatively and significantly related to ROA. However, in robust test, we found board independence insignificant in explaining ROA. Our result suggests that board independence in Turkish firms is not associated with important performance measures. There is no link between board independence and firm performance.

In general, we may conclude that firms with more independent boards do not perform better than other firms.

Foreign ownership is positively and significantly ( $p < 0.10$ ) related to leverage. On the other hand, we found no relation between foreign ownership and other corporate governance variables.

We found no significant relationships between corporate governance variables and performance indicators in publicly held companies (floating rate).

Asset size is positively related to ebitda, pbv, leverage and negatively related to ROA. The direction signs of relations are all expected. The results of the model show that the ebitda of the firms is positively and significantly affected by firm size which is consistent with previous empirical works. On the other hand, increase in foreign ownership increases leverage. It indicates that foreign ownership like to use leverage and also foreign ownership makes borrowing easier which is an assumption of this study.

Leverage ratio is statistically significant to corporate governance with a positive relationship to net sales and asset size and a negative relationship with ebitda.

This research employed BIST 100 and CG Index companies (50 companies). We believe that these companies are already using corporate governance principals and therefore observing the differences caused by corporate governance should not be easy. Therefore increasing the number of companies observed in these types of studies would provide further benefit. Additionally we did not consider the sector differences which make observing the effects more difficult. However this study presents the effect of ownership concentration and board structure together through using panel data analysis.

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