

# **The Impact of Ownership Structure on Company Performance; A Panel Data Analysis on Istanbul Stock Exchange Listed (ISE-100) Companies**

**Levent Çitak**

*Assistant Professor, Faculty of Economics and Administrative Sciences  
Department of Accounting and Finance  
Erciyes University, 38039, Kayseri, Turkey*

## **Abstract**

Ownership structure is thought of as one of the major factors that affect company accounting and market based performance. The results on this issue for Turkey and other countries yield varying findings. Within the framework of a panel data analysis, this paper search the relationship between ownership structure (ownership concentration & ownership identity) and company performance measured by return on equity (ROE), and market to book value of equity (MBV). Using data for the period 2000-2004 of the companies listed on İstanbul Stock Exchange (ISE-100 Index), we find significant positive relationship between ownership concentration and market to book value of equity (MBV), which is one of the market based performance measures. A major implication of this finding might be that investors place value on concentrated ownership.

**Keywords:** Ownership concentration, company performance, return on equity (ROE), market to book value (MBV).

**JEL Classifications:** G12, G14, G32

## **1. Introduction**

The relationship between ownership structure and company performance has widely been argued in the literature. A major aspect of ownership structure is related to how concentrated the company's shares are. A company's ownership is said to be highly concentrated if a high percentage of shares is in the possession of relatively small number of owners. The focus of the studies, that search for the relationship between ownership structure and company performance ranges from the agency relationship between owners and managers, to owner identity. Despite the fact that every study examines a different period and different groups of companies and countries, majority of the papers find a positive relationship between ownership structure and company performance measured by Return on Assets (ROA), Return on equity (ROE), Market to Book Value of Equity (MBV), Tobin's Q, Sales Growth, Profit Growth, etc. However, studies about ownership structure and company performance lead to varying results. The purpose of this study is to examine the relationship between ownership structure of İstanbul Stock Exchange listed (ISE-100) companies and their accounting and market-based performance over the period of 2000-2004. The study uses the percentage share of the largest shareholder as the concentration measure, return on equity (ROE) as the accounting performance measure and market to book value (MBV) as the market-based performance measure of companies

## **2. Literature Review**

In a study examining the causes and effects of ownership concentration among the largest 12 European countries Pedersen and Thomsen (1999) find that ownership share of the largest owner does not have a significant effect on the return on equity (ROE). Although they find a statistically significant quadratic relationship between ownership concentration and return on equity, they witness that the relationship become insignificant after controlling for country effects. In their study of the largest European companies examining 1990-1995 period, Thomsen and Pedersen (2000) find positive and significant relationships between the ownership share of the largest owner and Market to Book Value of Equity (MBV). Another finding of their study is that companies, in which the largest owner is an institutional owner, have higher market-to-book values than market-to-book values of companies with other owner identities (bank, non-financial company, person/family, government). For companies in which the largest owner is a bank, a person/family or government they find a negative relationship between ownership structure and market-to book value (MBV). They find relationships between ownership structure and Return on Assets (ROA) in the same direction as those with market-to book value. Another study on Chinese stock-exchange listed companies examines the effects of ownership concentration on company performance, measured by return on equity (ROE), return on assets (ROA) and market to book value of equity (MBV), and evaluates the role of owner identity on company performance. Using pooled data on Shanghai Stock Exchange-listed and Shenzhen Stock Exchange-listed companies Xu and Wang (1997) find a positive relationship between ownership concentration and company performance and that the effect of ownership concentration is stronger for dominantly owned by legal person (1) shareholders than for state owned enterprises. Another finding of Xu and Wang (1997) is that in general, the ratio of individual investor ownership in the companies is negatively related to company profitability, signaling that the market values individual private ownership negatively.

The fact that shareholders wish to maximize company profit, while managers may prefer non-profit maximizing goals has yielded studies about the impact of divergent interests of shareholders and managers on company performance. In some studies, it is argued that increasing managerial ownership incentives (stocks and stock options) will highly likely converge the interests of shareholders and managers, thereby affecting company performance Wright et.al., (2002). A study on ownership structure and company performance takes an approach through which two dimensions of ownership structure, that generally represent conflicting interests of shareholders and managers, are examined. In the study, Demsetz and Villalonga (2001) examines the fraction of shares owned by management and the fraction of shares owned by the five largest shareholders as the two dimensions of ownership structure, and conclude that the two dimensions are not significant enough as determinants of company performance measured by Tobin's Q. It is widely argued that owner controlled companies display better performance than the manager controlled companies. In another study possible effects of ownership and control structures on company performance are examined and it is found that ownership proxies such as the rate of shares held by certain homogenous groups, the rate of shares held by non-executive board members have an impact on company performance through interactions with variables of organizational form (Ezzamel and Watson, 1993). In a cross national study in which U.S.A, UK, Germany, France and Canada are included, Gedajlovic and Shapiro (1998) examines ownership concentration-performance relationship within the context of differing national corporate governance systems. Various aspects of corporate governance systems, such as ownership identity, the level of shareholder power, dominant type of financing etc. are analyzed as the likely determinants of different ownership concentration-performance relationships among the countries included. The study finds strong ownership effects (negative effect to a certain level of ownership concentration and positive effect beyond that point) in the USA, weaker negative effects in Germany (negative effect to a certain level of ownership concentration and positive effect after that point), too little effects in the UK. and no effects at all in Canada or France on Return on Assets (ROA).

In a panel study of 361 German companies over the period of 1991 to 1996, Weigand and Lehmann (1999) find statistically significant negative relationships between ownership concentration

(percentage stake of the largest shareholder) and return on assets (ROA) and return on equity (ROE) Using panel data for companies listed on Budapest stock Exchange in their study, Earle et.al. (2005) examine the impact of ownership concentration on company performance. They conclude that the higher the ownership rate of a single large blockholder the more improved company performance is and increased ownership of additional blockholders (secondary blockholders after a single large one) does not improve performance or may even decrease

In a recent study using a dataset of Turkish industrial companies listed on the Istanbul Stock Exchange (ISE) for the period of 1997-2003, Arslan and Karan (2006) find a positive significant relationship between ownership concentration and corporate debt maturity. They conclude that, increase in ownership concentration and the presence of a large shareholder lead companies to lower their level of short term debt, resulting from increased monitoring of managers. In a study consisting of İstanbul Stock Exchange listed 185 industrial companies, Gonenc (2004) examine whether concentrated ownership measured by the percentage of shares owned by the three largest shareholders creates an agency problem about expropriation of minority shareholders. He finds that concentrated ownership has positive and significant impact on market to book value (MBV), indicating an improvement in the degree of monitoring which reduces conflicting interests between controlling shareholders and minority shareholders. Nevertheless, he also concludes that large shareholders in Turkish industrial companies alter and restructure their ownership depending on expectations about market or accounting performance of the company and therefore ownership structure is determined endogenously. For example, he finds that the accounting performance of the company measured by return on assets (ROA) has significant negative impact on ownership concentration. Using data on 102 non-financial stock market listed German companies, Edwards and Weichenrieder (1999) finds that as ownership share of the largest shareholder rises the market value of the company also rises through monitoring and convergence of interest-effects, whereas the rise in the ownership share of the largest shareholder may decrease the market value due to the increased ability of the largest shareholder to receive advantages of benefit at the expense of minority shareholders. The findings of the study indicate that for most types of largest shareholders the beneficial effects of higher ownership concentration outweigh the negative effect on minority shareholders

There is no common understanding as to whether ownership concentration should be treated as an endogenous variable determined by other factors or as an exogenous variable that determines company value and performance. Onder (2003) treats ownership concentration in both ways. In the study, first ownership concentration is estimated as an endogenous variable in model and then company performance is estimated in another model where ownership concentration, and other explanatory variables are included. Examining all İstanbul Stock Exchange listed companies with available ownership concentration data between 1992 and 1997, the study uses Tobin's Q and return on assets (ROA) as measures of company performance. The study finds no significant relationship between ownership concentration and return on assets (ROA) but a significant quadratic relationship between the concentration of the largest shareholder and Tobin's Q. The quadratic relationship indicates that if the ownership concentration of the largest shareholder is less than 56 %, Tobin's Q increases as concentration increases and below the cut point of 56 %, Tobin's Q decreases as concentration increases (Onder, 2003). As far as the endogeneity of ownership concentration is concerned, in their study on European companies Pedersen and Thomsen (2003) find that ownership performance is positively related to the value of the company, measured by Tobin's Q even after the observed positive feedback from company value to ownership concentration is taken into account

Using a sample consisting of non-financial companies listed on İstanbul Stock Exchange between 1992 and 1998, GURSOY and AYDOĞAN (1999) investigates the relationship between ownership concentration and company accounting performance measured by return on equity (ROE) and return on assets (ROA), as well as market based performance measured by price to earnings ratio (P/E) and stock return (RET). The study finds a significantly positive relationship for ownership concentration of the three largest shareholders with price to earnings ratio (P/E) and a negative relationship with accounting measures.

In their study on Czech companies, which are consistently listed on the Prague stock Exchange over 1992-1995 period, Claessens et.al., (1997) find that the total percentage of ownership share of the five largest shareholders is positively related to profitability and market value.

### **3. The Data**

This study investigates the relationship between the ownership structure of companies listed on The İstanbul Stock Exchange (ISE-100) and their accounting and market-based performance. The reason of choosing ISE-100 companies for the analysis is that ISE-100 is considered the benchmark index for İstanbul Stock Exchange in many academic and practical business settings. The study covers the period of 2000-2004 on a panel data basis. İstanbul Stock Exchange determines the companies to be included in ISE-100 Index on a quarterly basis allowing for inclusions and exclusions at the start of each quarter. For the sake of having data on the same companies in each year of the analysis period, the companies that were in ISE-100 Index in the first quarter of the year 2000 are used in the analysis. 18 of the companies, that were originally in ISE-100 Index in the first quarter of the year 2000, were delisted for various reasons like; being in the liquidation process, being taken over by another company, being merged with another company etc. For the sake of performing analysis on a balanced panel (2) we choose to work with surviving companies. That leaves us with 82 companies. However, 3 of the companies have both negative earnings and negative equity in at least one of the years (2000-2004) in the analysis period. Since dividing negative earnings (losses) by negative equity, yields positive return on equity (ROE) creating a distorted ratio, these 3 companies are also excluded leaving eventual 79 companies for the analysis.

The data for 79 companies were obtained in two different ways. Data on the percentage share of the largest owner and owner identity were obtained from yearbooks of companies on a cd provided by İstanbul Stock Exchange upon a written request. Market to book value (MBV) data were obtained directly and return on equity ratios (ROE) were computed using net profit and equity data from the web site of İstanbul Stock Exchange.

### **4. Definition of Variables and Model Design**

This study investigates the impact of ownership structure on both the accounting performance and market based performance of the companies, measured by return on equity (ROE) and market to book value of equity (MBV) respectively. Therefore, two different regression models based on panel data are estimated, where return on equity (ROE) and market to book value (MBV) are the dependent variables. Ownership concentration, along with two dummy variables for owner identity are included as the explanatory variables of the models. Some studies find nonlinear relationships between ownership concentration and company performance. For example Because of the possibility that there may be a nonlinear relationship between the ownership concentration and performance of the company, a nonlinear regression model, for each performance measure, is also estimated in which the square of the ownership concentration is included as another explanatory variable. Eventually a total of four regression models, two for each performance measure, are estimated. All the estimations are carried out using EViews 5.1 software.

#### **4.1. Definition of Variables**

Although the study mainly investigates the relationship between ownership concentration and company performance, the effect of owner identity is investigated as well. Owner identity is incorporated with the models via two dummy variables, one for whether the largest shareholder is a holding and one for whether the largest shareholder is an incorporation other than a holding. Representing owner identities, dummy variables were initially intended to use for privatization administration and person owners in order to investigate whether state ownership and individual

ownership, respectively, make a difference in the company performance. However the fact that the number of companies, in which the largest owner is privatization administration or an individual owner, does not exceed 4-5 confined us to use two dummy variables. As few as 4-5 observations for a dummy variable out of a total of 79 companies could have yielded nonsensical results.

Since the study covers the period of 2000-2004 on panel data basis, a total number of 395 observations (5x79) for each variable are used. Following are the definitions of variables in the models.

ROE	= return on equity computed as net profit divided by equity.
MBV	= book to market value of equity.
OWN	= The percentage share owned by the largest shareholder.
OWN <sup>2</sup>	= Square of the percentage share owned by the largest shareholder.
HOLD	= whether the largest shareholder is a holding or not. It takes the value of 1 if it is a holding company and 0 if it is not a holding company.
INCORP	= whether the largest shareholder is an incorporation other than a holding or not. It takes the value of 1 if it is a incorporation other than a holding and zero otherwise. Otherwise includes holding companies along with person owners and entities like privatization administration (özelleştirme idaresi başkanlığı), armed forces pension fund (ordu yardımlaşma kurumu). Therefore, note that the dummy variable Incorp is different than the dummy variable Hold.

#### 4.2. Model Design

Following are the regression models used in the study. Two regression models, one linear and one non-linear, correspond to each of the performance measures. Therefore, there are two regression models for return on equity (ROE) and two models for market to book value (MBV).

$$ROE_{it} = \beta_1 OWN_{it} + \beta_2 HOLD_{it} + \beta_3 INCORP_{it} + \alpha_i + \lambda_t + \varepsilon_{it} \quad (1)$$

$$ROE_{it} = \beta_1 OWN_{it} + \beta_2 OWN_{it}^2 + \beta_3 HOLD_{it} + \beta_4 INCORP_{it} + \alpha_i + \lambda_t + \varepsilon_{it} \quad (2)$$

$$MBV_{it} = \beta_1 OWN_{it} + \beta_2 HOLD_{it} + \beta_3 INCORP_{it} + \alpha_i + \lambda_t + \varepsilon_{it} \quad (3)$$

$$MBV_{it} = \beta_1 OWN_{it} + \beta_2 OWN_{it}^2 + \beta_3 HOLD_{it} + \beta_4 INCORP_{it} + \alpha_i + \lambda_t + \varepsilon_{it} \quad (4)$$

The subscript  $i = 1, 2, \dots, 79$  stands for individual companies, while  $t = 1, 2, 3, 4, 5$  stands for the years 2000-2004. Cross-section fixed effects, resulting from unobserved explanatory variables that change from one company to another but do not change over time, are represented by  $\alpha_i$ . Time fixed effects, resulting from unobserved explanatory variables that change from one period to another but do not change across companies, are represented by  $\lambda_t$ . Finally,  $\varepsilon_{it}$  represents the error term.

#### 5. Tests of Fixed Effects and Random Effects

The fixed effects regression models allows the unobserved explanatory variables- either cross-section fixed or time fixed- to be correlated with the observed explanatory variables. If the unobserved explanatory variables are strictly uncorrelated with the observed explanatory variables, then it might be appropriate to treat the regression model as a random effect model, where cross-section specific constant terms (a different constant term for each cross-section unit) are randomly distributed across cross sectional units (Greene, 2003; 293, 299). In modern econometrics "Random effect" is considered synonymous with zero correlation between the observed explanatory variables and unobserved explanatory variables (Wooldridge, 2002; 252). In order to decide whether fixed effects or random effects model is appropriate in the regression models, fixed effects tests and Hausman random effects tests are performed using Eviews 5.1.

### 5.1. Tests of Fixed Effects

In the cross section fixed effects regression model  $\alpha_1, \alpha_2, \dots, \alpha_n$ , ( $\alpha_i$ ), are treated as unknown intercepts to be estimated, one for each cross-section unit, company in our case. Just as cross-section fixed effects regression model treats intercepts as varying across units, time fixed effects regression model control for variables that are constant across units but vary over time (Stock and Watson, 2003; 279, 283).

The null and alternative hypotheses of tests of fixed effects are as follows;

#### Cross Section Fixed Effects Test

$H_0: \alpha_i = \alpha$ , for all  $i = 1, \dots, 79$  (no cross-section fixed effect)

$H_1: \alpha_i \neq \alpha$ , for all  $i = 1, \dots, 79$  (cross-section fixed effect)

#### Time Fixed Effects Test

$H_0: \lambda_t = \lambda$ , for all  $t = 1, \dots, 5$  (no time fixed effect)

$H_1: \lambda_t \neq \lambda$ , for all  $t = 1, \dots, 5$  (time fixed effect)

The results of the fixed effects tests for the 4 regression equations are shown in Table 1. First panel of Table 1 indicates that the null hypotheses that there are no fixed effects in the data are rejected at significance levels of at most % 5 (prob 0.0463). Based on fixed effects tests of the linear regression model for ROE (Equation 1), the null hypotheses that there is no cross-section fixed effect, no period fixed effect and no cross-section and time fixed effect are rejected.

Second panel of Table 1 also indicates that, based on fixed effects tests of the non-linear regression model for ROE (Equation 2), the null hypotheses that there are no fixed effects are rejected at significance Levels of at most % 10 (prob 0.0508). Therefore, the results imply that there are both cross-section fixed and time fixed effects in both linear and non-linear regression models of ROE. However, in order to come to a sound decision on whether fixed effects or random effects is appropriate, we also run "Hausman Test For Random Effects" for equation 1 and 2, laid out in the next section.

Third and fourth panels of Table 1 give the results of fixed effects tests of linear and nonlinear regression models (Equations 3 & 4) for MBV, respectively. The null hypotheses that there are no fixed effects in the data are rejected at the highest significance levels possible (prob 0.0000). Based on fixed effects tests of the regression models, the null hypotheses that there is no cross-section fixed effect, no period fixed effect and no cross-section and time fixed effect are rejected. Therefore, the results imply that there are both cross-section fixed and time fixed effects in both linear and non-linear regression models of MBV. However, just as for ROE, in order to come to a sound decision on whether fixed effects or random effects is appropriate, we also run "Hausman Test For Random Effects" for equations 3 and 4.

**Table 1:** Fixed Effects Test Results for ROE and MBV

Fixed Effects Test	Statistic	d.f.	Prob.
<b>Equation 1: Return on Equity (ROE)-Own (Linear)</b>			
Cross-section F	1.332892	(78,309)	0.0463
Cross-section Chi-square	114.559083	78	0.0044
Period F	3.675645	(4,309)	0.0061
Period Chi-square	18.361124	4	0.0010
Cross-Section/Period F	1.447668	(82,309)	0.0136
Cross-Section/Period Chi-square	128.415029	82	0.0008
<b>Equation 2: Return on Equity (ROE)-Own<sup>2</sup> (Non-linear)</b>			
Cross-section F	1.322949	(78,308)	0.0508
Cross-section Chi-square	114.137474	78	0.0048
Period F	3.666546	(4,308)	0.0062
Period Chi-square	18.374814	4	0.0010
Cross-Section/Period F	1.437890	(82,308)	0.0151
Cross-Section/Period Chi-square	128.027870	82	0.0009
<b>Equation 3: Market to Book Value of Equity (MBV) –Own (Linear)</b>			
Cross-section F	3.222238	(78,309)	0.0000
Cross-section Chi-square	235.101146	78	0.0000
Period F	8.863798	(4,309)	0.0000
Period Chi-square	42.905983	4	0.0000
Cross-Section/Period F	3.501192	(82,309)	0.0000
Cross-Section/Period Chi-square	259.540013	82	0.0000
<b>Equation 4: Market to Book Value of Equity-Own<sup>2</sup> (Non-linear)</b>			
Cross-section F	3.220539	(78,308)	0.0000
Cross-section Chi-square	235.582373	78	0.0000
Period F	8.639683	(4,308)	0.0000
Period Chi-square	42.005621	4	0.0000
Cross-Section/Period F	3.498574	(82,308)	0.0000
Cross-Section/Period Chi-square	260.014699	82	0.0000

## 5.2. Tests of Random Effects (Hausman Test for Random Effects)

Hausman Test for Random Effects is based on comparing the slope estimates of random effects regression model and fixed effects regression model (Greene, 2003; 302; Wooldridge, 2002; 288).

The null and alternative hypotheses of Hausman Test for Random Effects are as follows;

### Hausman Test for Random Effects

H<sub>0</sub>: fixed effects estimates and random effects estimates are equal (random effect)

H<sub>1</sub>: fixed effects estimates and random effects estimates are different from each other (no random effect)

The results of the random effects tests for the 4 regression equations are shown in tables 2 through 5.

As can be seen in the first panel of Table 2, the null hypothesis that there are cross-section random effects in the linear regression model for ROE can not be rejected (prob 0.7550). The null hypotheses that fixed effects coefficient estimates and random effects coefficient estimates are equal to each other can not be rejected either. In other words, we can conclude that there is no significant difference between fixed effects estimate and random effects estimate for each variable. Therefore cross-section random effects is appropriate in the linear regression model for ROE.

**Table 2:** Random Effects - Hausman Test Results for ROE (Linear Regression Model)

<b>Equation 1: ROE - Cross Section Random Effects</b>				
Test Summary Cross-section random		Chi-Sq. Statistic 1.191805	Chi-Sq. d.f. 3	Prob. 0.7550
<b>Cross-section random effects test comparisons</b>				
Variable	Fixed	Random	Var(Diff.)	Prob.
OWN	-0.671526	-0.046246	0.375181	0.3073
HOLD	0.225869	0.024085	0.087838	0.4960
INCORP	0.262655	-0.037268	0.139269	0.4216
<b>Equation 1: ROE – Period Random Effects</b>				
Test Summary Period random		Chi-Sq. Statistic 14.702166	Chi-Sq. d.f. 3	Prob. 0.0021
<b>Period random effects test comparisons</b>				
Variable	Fixed	Random	Var(Diff.)	Prob.
OWN	-0.671526	-0.650615	0.008007	0.8152
HOLD	0.225869	0.261194	0.000555	0.1337
INCORP	0.262655	0.274841	0.001066	0.7090

As can be seen in the second panel of Table 2, the summary result and test comparison results are inconsistent with each other. Test summary indicates the rejection of the null hypothesis that there are period random effects in the linear regression model for ROE. On the other hand test comparisons indicate that the null hypotheses that fixed effects coefficient estimates and random effects coefficient estimates are equal to each other can not be rejected. Because of this inconsistency time fixed effects is appropriate in the linear regression model for ROE. Evaluating the results of Table 2, we decide to use cross-section random effects and time fixed effects in estimating the linear regression equation for ROE.

**Table 3:** Random Effects - Hausman Test Results for ROE (Non-Linear Regression Model)

<b>Equation 2: ROE – Own<sup>2</sup> – Cross Sec. Random Effects</b>				
Test Summary Cross-section random		Chi-Sq. Statistic 1.419848	Chi-Sq. d.f. 4	Prob. 0.8407
<b>Cross-section random effects test comparisons</b>				
Variable	Fixed	Random	Var(Diff.)	Prob.
OWN	-1.527493	0.437860	7.015565	0.4581
OWN <sup>2</sup>	0.847169	-0.500947	6.448496	0.5955
HOLD	0.254078	-0.004389	0.093822	0.3988
INCORP	0.302465	-0.057544	0.154242	0.3593
<b>Equation 2: ROE – Own<sup>2</sup> – Period Random Effects</b>				
Test Summary Period random		Chi-Sq. Statistic 14.666183	Chi-Sq. d.f. 4	Prob. 0.0054
<b>Period random effects test comparisons</b>				
Variable	Fixed	Random	Var(Diff.)	Prob.
OWN	-1.527493	-1.471499	0.141370	0.8816
OWN <sup>2</sup>	0.847169	0.814045	0.103168	0.9179
HOLD	0.254078	0.288716	0.000431	0.0951
INCORP	0.302465	0.313783	0.000736	0.6765

As can be seen in the first panel of Table 3, the null hypothesis that there are cross-section random effects in the non-linear regression model for ROE can not be rejected (prob 0.8407). The null hypotheses that fixed effects coefficient estimates and random effects coefficient estimates are equal to each other can not be rejected either. In other words, we can conclude that there is no significant difference between fixed effects estimate and random effects estimate for each variable. Therefore cross-section random effects is appropriate in the non-linear regression model for ROE. As can be seen in the second panel of Table 3, just as in the second panel of Table 2 mentioned above, the

summary result and test comparison results are inconsistent with each other. Because of this inconsistency, time fixed effects is appropriate in the non-linear regression model for ROE. Evaluating the results of Table 3, we decide to use cross-section random effects and time fixed effects in estimating the non-linear regression equation for ROE.

**Table 4:** Random Effects - Hausman Test Results for MBV (Linear Regression Model)

<b>Equation 3: MBV - Cross Section Random Effects</b>				
Test Summary Cross-section random		Chi-Sq. Statistic 3.350783	Chi-Sq. d.f. 3	Prob. 0.3406
<b>Cross-section random effects test comparisons</b>				
Variable	Fixed	Random	Var(Diff.)	Prob.
OWN	2.742291	2.538180	5.137033	0.9282
HOLD	-2.231357	-0.445563	1.211377	0.1047
INCORP	-0.165197	0.456322	1.962056	0.6573
<b>Equation 3: MBV- Period Random Effects</b>				
Test Summary Period random		Chi-Sq. Statistic 2.527464	Chi-Sq. d.f. 3	Prob. 0.4703
<b>Period random effects test comparisons</b>				
Variable	Fixed	Random	Var(Diff.)	Prob.
OWN	4.140172	3.999360	0.011386	0.1870
HOLD	-2.155471	-2.163264	0.000777	0.7798
INCORP	-0.102057	-0.108881	0.001497	0.8600

As can be seen in the first panel of Table 4, the null hypothesis that there are cross-section random effects in the linear regression model for MBV can not be rejected (prob 0.3406). The null hypotheses that fixed effects coefficient estimates and random effects coefficient estimates are equal to each other can not be rejected either. In other words, we can conclude that there is no significant difference between fixed effects estimate and random effects estimate for each variable. Therefore cross-section random effects is appropriate in the linear regression model for MBV. As can be seen in the second panel of Table 4, the null hypothesis that there are period random effects in the linear regression model for MBV can not be rejected (prob 0.4703). The null hypotheses that fixed effects coefficient estimates and random effects coefficient estimates are equal to each other can not be rejected either. In other words, we can conclude that there is no significant difference between fixed effects estimate and random effects estimate for each variable. Therefore time random effects is also appropriate in the linear regression model for MBV. Evaluating the results of Table 4, we decide to use both cross-section and time random effects in estimating the linear regression equation for MBV.

As can be seen in the first panel of Table 5, the null hypothesis that there are cross-section random effects in the non-linear regression model for MBV can not be rejected (prob 0.4406). The null hypotheses that fixed effects coefficient estimates and random effects coefficient estimates are equal to each other can not be rejected either. In other words, we can conclude that there is no significant difference between fixed effects estimate and random effects estimate for each variable. Therefore cross-section random effects is appropriate in the non-linear regression model for MBV. As can be seen in the second panel of Table 5, the null hypothesis that there are cross-section random effects in the non-linear regression model for MBV is rejected (prob 0.0000). The null hypotheses that fixed effects coefficient estimates and random effects coefficient estimates are rejected for OWN and OWN<sup>2</sup>. In other words, we can conclude that there is significant difference between fixed effects estimate and random effects estimate for OWN and OWN<sup>2</sup>. Therefore time fixed effects is appropriate in the non-linear regression model for MBV. Evaluating the results of Table 5, we decide to use cross-section random effects and time fixed effects in estimating the non-linear regression equation for MBV.

**Table 5:** Random Effects - Hausman Test Results for MBV (Non-Linear Regression Model)

<b>Equation 4: MBV– Own<sup>2</sup> – Cross Sec. Random Effects</b>				
Test Summary Cross-section random		Chi-Sq. Statistic 3.752259	Chi-Sq. d.f. 4	Prob. 0.4406
<b>Cross-section random effects test comparisons</b>				
<b>Variable</b>	<b>Fixed</b>	<b>Random</b>	<b>Var(Diff.)</b>	<b>Prob.</b>
OWN	-2.054521	2.576802	88.465225	0.6224
OWN <sup>2</sup>	6.131020	0.313879	80.633793	0.5171
HOLD	-1.951320	-0.414738	1.143366	0.1507
INCORP	0.186054	0.535208	1.959574	0.8030
<b>Equation 4: MBV– Own<sup>2</sup> – Period Random Effects</b>				
Test Summary Period random		Chi-Sq. Statistic 34.558733	Chi-Sq. d.f. 4	Prob. 0.0000
<b>Period random effects test comparisons</b>				
<b>Variable</b>	<b>Fixed</b>	<b>Random</b>	<b>Var(Diff.)</b>	<b>Prob.</b>
OWN	-2.054521	-8.230524	1.992918	0.0000
OWN <sup>2</sup>	6.131020	10.881389	1.454366	0.0001
HOLD	-1.951320	-1.863462	0.006070	0.2594
INCORP	0.186054	0.355347	0.010373	0.0965

## 6. Findings

Using the above determined effects specifications, four regression models, two for ROE and two for MBV, are estimated. First panel of Table 6 depicts the linear regression model for ROE with cross-section random and time fixed effects. The sign of OWN variable implies a negative relationship between ownership concentration and return on equity. However, the linear regression model for ROE, as a whole, is not significant (prob=0.184899). None of the explanatory variables is significant, as well. Therefore, we conclude that there is no significant relationship between ownership structure and return on equity (ROE).

**Table 6:** Linear and Non-linear Regression Results for ROE

<b>Dependent Variable: ROE (Linear Regression)</b>				
<b>Method: Panel EGLS (Cross-section random effects)</b>				
<b>Total panel (balanced) observations: 395</b>				
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
C	0.048448	0.120910	0.400693	0.6889
OWN	-0.046246	0.199257	-0.232090	0.8166
HOLD	0.024085	0.099784	0.241370	0.8094
INCORP	-0.037268	0.111235	-0.335038	0.7378
<b>Weighted Statistics</b>				
R-squared	0.0337995	Durbin-Watson		2.476611
Adjusted R-squared	0.020595	statProb(F-statistic)		0.184899
<b>Dependent Variable: ROE (Non-Linear Regression)</b>				
<b>Method: Panel EGLS (Cross-section random effects)</b>				
<b>Total panel (balanced) observations: 395</b>				
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
C	-0.026763	0.171514	-0.156039	0.8761
OWN	0.437860	0.805805	0.543382	0.5872
OWN2	-0.500947	0.807493	-0.620374	0.5354
HOLD	-0.004389	0.110140	-0.039847	0.9682
INCORP	-0.057544	0.116289	-0.494835	0.6210
<b>Weighted Statistics</b>				
R-squared	0.038983	Durbin-Watson stat		2.479930
Adjusted R-squared	0.019065	Prob(F-statistic)		0.150675

Second panel of Table 6 depicts the results of non-linear regression model for ROE with cross-section random and time fixed effects. The signs of OWN and OWN<sup>2</sup> variables imply a bell shaped relationship between ownership concentration and return on equity, that is, return on equity increases as ownership concentration increases to a certain level and return on equity decreases as ownership concentration increases beyond that level. However, the non-linear regression model for ROE, as a whole, is not significant (prob=0.150675). None of the explanatory variables is significant, as well. Therefore, we conclude that there is no significant relationship between ownership structure and return on equity (ROE).

**Table 7:** Linear and Non-linear Regression Results for MBV

<b>Dependent Variable: MBV (Linear Regression)</b>				
<b>Method: Panel EGLS (Two-way random effects)</b>				
<b>Total panel (balanced) observations: 395</b>				
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
C	1.152015	0.769614	1.496873	0.1352
OWN	2.845469	1.077918	2.639781	0.0086
HOLD	-0.432659	0.541000	-0.799739	0.4243
INCORP	0.515722	0.608271	0.847849	0.3970
<b>Weighted Statistics</b>				
R-squared	0.025451	Durbin-Watson stat		2.136432
Adjusted R-squared	0.017974	Prob(F-statistic)		0.017791
<b>Dependent Variable: MBV (Non-Linear Regression)</b>				
<b>Method: Panel EGLS (Cross-section random effects)</b>				
<b>Total panel (balanced) observations: 395</b>				
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
C	1.181099	0.929891	1.270148	0.2048
OWN	2.576802	4.425801	0.582223	0.5608
OWN <sup>2</sup>	0.313879	4.411744	0.071146	0.9433
HOLD	-0.414738	0.591831	-0.700771	0.4839
INCORP	0.535208	0.636730	0.840557	0.4011
<b>Weighted Statistics</b>				
R-squared	0.102745	Durbin-Watson stat		2.146393
Adjusted R-squared	0.084149	Prob(F-statistic)		0.214083

First panel of Table 7 depicts the results of linear regression model for MBV with cross-section and time random effects. The linear regression model for MBV, as a whole, is significant at 5 % level (prob=0.017791). The sign of OWN variable implies a positive relationship between ownership concentration and market to book value and this relationship is significant at 1 % level (prob=0.0086). Adjusted R<sup>2</sup> of 0.019065 indicates that almost 2 percent of the variation in ROE can be explained by the variation in the percentage share of the largest shareholder. On the other hand the coefficients of owner identity variables, namely HOLD and INCORP are not statistically significant, indicating that the identity of the largest shareholder has no direct impact on return on equity. Therefore, we conclude that, regardless of owner identity, there is a significant positive relationship between ownership concentration and market to book value (MBV) as a measure of market based company performance.

Second panel of Table 7 depicts the results of non-linear regression model for MBV with cross-section random and time fixed effects. The signs of OWN and OWN<sup>2</sup> variables imply a positive relationship between ownership concentration and market to book value, that is, return on equity increases at a higher rate as ownership concentration increases to a certain level and return on equity increases at a lower rate as ownership concentration increases beyond that level. However, the non-linear regression model for ROE, as a whole, is not significant (prob=0.214083). None of the explanatory variables is significant, as well. Therefore, we conclude that there is no significant relationship between ownership structure and market to book value (MBV).

## 7. Conclusion

In this paper we investigate the relationship between ownership structure (ownership concentration and owner identity) and company accounting performance and market based performance, measured by return on equity (ROE) and market to book value of equity (MBV). The results of both linear and non-linear regression models for ROE reveal that there is no significant relationship between ownership structure and return on equity, which is one of the measures of accounting performance of a company, for the companies in the study. This finding is consistent with Önder's (2003) finding that

there is no significant relationship between ownership concentration and return on assets (ROA), which is another measure of accounting performance. On the other hand as far as the market based performance is concerned, we find a significant positive relationship with ownership concentration and market to book value (MBV), though owner identity has no significant impact on that performance. This finding is consistent with Thomsen and Pedersen (2000) which finds positive and significant relationships between the ownership share of the largest owner and Market to Book Value of Equity (MBV). Our finding is also consistent with Gonenc's (2004) finding that there is a positive significant relationship between concentrated ownership and market to book value (MBV). This finding may have an implication that the investors perceive concentrated ownership as increased monitoring of the managers' activities and decreased conflicts of interest between larger shareholders and minority shareholders both of which result in raised market value of the company by the investors. Due to cultural attributes and investment customs, it is highly likely that Turkish investors regard concentrated ownership more as a competitive advantage of a company than other investors in most countries. This might be another factor underlying the positive relationship between ownership concentration and market based performance of companies.

### **Endnotes**

- (1) A legal person in China is defined as a non-individual legal entity or institution (Xu and Wang, 1997; 7).
- (2) A balanced panel has no missing observation, that is, the variables are observed for every entity and every time period, (Stock and Watson, 2003; 272).

## References

- [1] Arslan, Özgür and Mehmet Baha Karan (July 2006), "Ownership and Control Structure as Determinants of Corporate Debt Maturity: a panel study of an emerging market", *Corporate Governance* Vol. 14, No. 4, pp. 312-324.
- [2] Claessens, Stijn., Simeon Djankov and Gerhard Pohl (May 1997), "Ownership and Corporate Governance; Evidence from the Czech Republic", *Public Policy for the Private sector*, The World Bank Group, Note No.117,
- [3] Demsetz, Harold and Belen Villalonga (2001), "Ownership Structure and Corporate Performance", *Journal of Corporate Finance*, 7, pp. 209-23.
- [4] Earle, John S., Csaba Kucsera and Almos Telegdy (2005), "Ownership Concentration and Corporate Performance on the Budapest Stock Exchange; Do Too Many Cooks Spoil The Goulash?" *Corporate Governance*, Vol. 13, No. 2, pp. 254-64
- [5] Ezzamel, Mahmoud and Robert Watson (1993), "Organizational Form, Ownership Structure and Corporate Performance; A Contextual Empirical Analysis of UK Companies", *British Journal of Management*, 4, pp. 161-76.
- [6] Gedajlovic, Eric R. and Daniel M. Shapiro (1998), "Management and Ownership Effects; Evidence From Five Countries", *Strategic Management Journal*, 19, pp. 533-53.
- [7] Gönenç, Halit (2006), "Ownership Concentration and Corporate Performance; A Simultaneous Equation Framework for Turkish Companies", in S. Altuğ and A. Filiztekin (ed.), *The Turkish Economy; The Real Economy, Corporate Governance, and Reform and Stabilization Policy*, Routledge Studies in Middle Eastern Economies, [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=498263](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=498263)
- [8] Gürsoy, Guner and Kursat Aydoğan (1999), "Equity Ownership Structure, Risk Taking and Performance; An Empirical Investigation in Turkish Companies", *ERC/METU International Conference in Economics*, 1999 Ankara, Turkey.
- [9] Greene, William H. (2003), *Econometric Analysis*, 5th Edition, New Jersey; Prentice Hall, Inc.
- [10] Önder, Zeynep (2003), "Ownership Concentration and Firm Performance; Evidence from Turkish Firms", *METU Studies in Development*, 30 (December), pp. 181-203.
- [11] Pedersen, Torben and Steen Thomsen (1999), "Economic and Systemic Explanations of Ownership Concentration Among Europe's Largest Companies", *International Journal of the Economics of Business*, Vol. 6, No. 3, pp. 367-81.
- [12] Pedersen, Torben. and Steen Thomsen (2003), "Ownership Structure and Value of the Largest European Firms; The Importance of Owner Identity", *Journal of Management and Governance*, 7, pp. 27-55.
- [13] Stock, James S. and Mark W. Watson (2003), *Introduction to Econometrics*, Addison Wesley Series.
- [14] Thomsen Steen. and Torben Pedersen (2000), "Ownership Structure and Economic Performance in the Largest European Companies", *Strategic Management Journal*, 21, pp. 689-705.
- [15] Wright, Peter, Mark Kroll, Augustine Lado and Bonnie Vanness (2002), "The Structure of Ownership and Corporate Acquisition Strategies", *Strategic Management Journal*, 23, pp. 41-53.
- [16] Weigand, Jürgen and Erik Lehmann (1999), "Does Ownership Structure Matter ? Governance Structures and the Market for Corporate Control in Germany", <http://www.fmpm.ch/files/3rd/lehmann.pdf>.
- [17] Wooldridge Jeffrey .M. (2002), *Econometric Analysis of Cross Section and Panel Data*, Cambridge, M.A.; The MIT Pres.
- [18] Xu, Xiaonian and Yan Wang (1997), "Ownership Structure, Corporate Governance and Firms' Performance; The Case of Chinese stock Companies", *World Bank Policy Research Working Paper*, No.1794,

<http://www.worldbank.org/html/dec/Publications/Workpapers/WPS1700series/wps1794/wps1794.pdf>