OWNERSHIP IDENTITY AND FIRM PERFORMANCE IN MANUFACTURING COMPANIES IN TURKEY: A MULTINOMIAL LOGIT MODEL APPROACH

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─**Abstract**─

The studies on ownership structure provides us with several testable hypothesis as well as empirical evidence from different countries. The study describes the main characteristics of ownership identities of the Turkish manufacturing companies listed on the Istanbul Stock Exchange (ISE) and examines the impact of ownership identity on performance. The identity of the owners has implications for their objectives and the way exercise their power, and this is reflected in company strategy.

A multinomial logit model has been developed to study the effects of different ownership identities on the selection of performance measurements. The model is then applied to explain the performance of ownership structure in manufacturing companies in Turkey.

Key Words: *Ownership Structure, Ownership Identity, Company Performance, Multinomial Logit Model.*

JEL Classification: G32,L25,C25

1. INTRODUCTION

The standard assumption in finance research is that owners want the company to maximize shareholder value. Although this assumption may be sufficient for many purposes, more general idea that owners (like managers) may be expected to maximize their utility, which may depend on other factors. One simple reason is that many owners (family firms, conglomerate affiliation, foreign companies, other companies) act as intermediate agents for final owners. Furthermore, even theoretically, profit maximization is only well defined when markets are complete (e.g., when all risk is diversifiable). When markets are incomplete, even profit-maximizing owners may

disagree about corporate strategy because of different preferences regarding risk and the time profile of expected cash flows (Thomsen and Pedersen,2000:689).

Nevertheless each equity owner has varying power over management, future expectations, risk approaches, goals, relationship with managers and minority stockholders, long and short term plans, company policies and strategies. Such variations not only shape corporate management approach in that particular country but also become effective on potential investor in leading their savings.

The subject of this essay is to test whether company performance indicating variables would reveal the identity of equity owners or not. In this study ownership identity (OWN) variables are classified in four groups such as family owned companies (FAM), enterprises linked to a holding or a group (HOLD), enterprises with foreigners as prevailing partner (FOR), and other enterprises not included in the groups above (OTHER). Performance variables is used as a independent variables.

The rest of the paper is organized as follows. Related literature is reviewed in Section 2. Section 3 provides an overview of the theoretical identification of variables . Section 4 introduces an econometric framework and estimation results are presented. Section 6 concludes.

2. LITERATURE REVIEW

A numerous studies conducted to explore effects of different types of ownership identities; for example, family firms, state owned and foreign owned etc. on firm performance. Driffield et al. (2005) tested how family and managerial shared ownership identity can affect performance in South East countires. Another studuy made by Bozec et al. (2002) examined state ownership influence on the 20 largest Canadian firms' performance They concluded that the profitability of firms can be significantly increased under state ownership.

Goethals and Ooghe (1997) in their study held on 50 foreign and 25 local companies in Belgium concluded that foreign companies have a better performance compared to local companies.

Boardman et al. (1997) in their study held on Canadian companies concluded that significant differences in performance had been observed statistically between multinational foreign companies and local companies. They concluded that multinational foreign companies had been more effective in terms of company performance.

In studies by Willmore (1986) on Brazil and Wiwattanakantang (2001) on Thailand it is concluded that company performance of foreign enterprises had been higher compared to local enterprises.

Family owned enterprises have long term planning approach for business objectives. Although long term brings risk with it, such long term projects are generally welcomed by such companies if the earnings of plans made are thought to be beneficial for future of the company. Some authors claim that many family owned companies continue to grow due to their adopted long term perspective (Anderson and Reeb,2003).

Family name and prestige contribute directly to company name and its prestige (Karpuzoğlu,2006). Confidence placed towards companies owned by families that have recognized standing in society also provide them advantages in competitiveness.

Through representation theory perspective, Dalton and Daily (1992) claim that such enterprises are most effective organizations since family owned companies do not have distinctly separated ownership and management. Family members are quite successful in utilizing required mechanisms of corporate management in order to observe and submit discipline to management.

In studies by Randoy and Jensen (2003) held on enterprises in Sweden and Norway established that family owned companies have preferred to employ CEO executives chosen among family members which had created substantial decrease in CEO wages. Besides they have emphasized that this issue was not reflected negatively on CEO's loyalty. Due to abovementioned characteristics of family owned enterprises, the study by Mishra at all. (2001) it is established that family owned companies performed better than other types of enterprises.

3. IDENTIFICATION OF VARIABLES

In order to investigate ownership indentity we regress our type of ownership identitiy variable against set of explanatory variables. The following variables used in this paper.

3.1. Ownership Identity Variable

In this research dummy variable is used as a dependent variable which has four values. An ownership identity variable specifies the structure of equity owner identity which is categorized family companies, enterprises linked to a holding or a group, enterprises with foreigners as prevailing partners and other enterprises.

Family Companies (FAM): Family companies (FAM) consist of enterprises and companies controlled by one or more families. Family members who are prevailing partners of the company (partner with voting rate enough to hold control of the company) are real individuals. In family owned businesses with a corporate partner this partnership should have a common prevailing partner title. Evidently main definitive aspect of a variable is the prevailing partner of that company. A company may have more than one type of equity owner. In such cases prevailing partner becomes the company's equity owner identity defining partner.

Enterprises Linked to a Holding or a Group (HOLD): We can shortly refer to enterprises linked to a holding or a group as holding enterprises (HOLD). Most significant feature of such enterprises is that they have a particular holding or a group among their partners titled as a prevailing partner. The holding itself may be the prevailing partner or can hold control of it via other businesses connected to the holding.

Holding enterprises benefit from the holding they are linked to in many different ways. For example, when the holding assigns expert executives information transfer flow is beneficial or a holding has significant support to enterprises linked to them in finding loans. Undoubtedly there are certain disadvantages next to such advantages such as lower flexibility for conduct and

insufficient monitoring on executives. On the other hand, most important problem is the risk of exploitation for minority equity owners by prevailing partners of holding enterprises.

Enterprises with Foreigners as Prevailing Partners (FOR): Some enterprises may have foreign investors among their partners. We may define such enterprises having a foreign corporate entity as prevailing partner among other company partners as foreign investments. Most significant feature of such companies is that foreign investors bring their technology, expertise, knowhow and prestige in countries they invest together with their capital. Especially it is another advantage to enable employment and capital contribution of such companies in economy of that particular country via direct investments.

Other Enterprises (OTH): This group includes other types of enterprises and businesses not classified in above mentioned groups. Other enterprises include enterprises with government as prevailing partner, enterprises not linked to any holding or group or enterprises with distributed capital (enterprises with no prevailing partner).

3.2. Performance Variables

Several data are used in company evaluations. Undoubtedly most important information is data owned by the enterprise itself. Our study will analyze company value information in two categories based on properties of such data. Evaluation variables based on historical data will be demonstrated under the title "accounting based value variables" and evaluation variables with prevailing market emerging data under the title "market based value variables".

Rates to be used in accounting based evaluation are Return on Assets (ROA), Return on Equity (ROE) and Profit per Share (PPS).

Rates to be used in market based evaluation are market value ratio over value on paper (MV/VP) and price over cash flow ratio (F/N).

Accounting based value variables are formed in the light of data in balance sheet and income statement and present past data. Such ratios are calculated by establishing pro rata links in several terms between items existing in financial accounts. In other words ratio is the basic mathematical expression of the link between two items (Akdoğan and Tenker,2007:640).

Return of assets (ROA) is a significant ratio sued to measure revenue of equities and liabilities invested in the enterprise indicating how profitable total resources were utilized. In our study ROA is calculated as shown below.

ROA= Net income/ Total Assets

Earnings per share (EPS) which shows profit per owned share(s) within net profit is calculated as follows;

EPS = Net profit (or loss) / Number of shares outstanding

Analysis based on historical data may be insufficient to evaluate future potential of an enterprise. Prices in a market do not emerge based only on historical data. Since speculation is pre-purchased market indicators shed light to possible situation like to happen in the future.

Market based value variables may also be interpreted as having cheap or expensive assets relatively speaking through the perspective of how similar assets are priced at the time of evaluation by the market.

Market value of Equity / Book Value of Equity (P/B) ratio is calculated by dividing market value of company's equity capital to its value on paper. Empirical studies indicate that earnings and return may be over normal values if invested in equity securities which have low and especially below one (P/B) ratio (Karan, 2001:359). In our study (P/B) ratio is calculated as shown below:

(P/B) =   Market Value of Equity / Book Value of Equity

The final market based value variable is ratio of Price / Cash flow price earnings (P/C). Price / Cash ratio is one of several developed methods as an alternative to price earnings ratio. Depreciation applications differ among companies. Due to different depreciation rates, it will be a healthier approach to compare results when net profit approach and cash flow approach are included in the analysis together (İvgen, 2003:124). In our study P/C ratio is calculated as shown below:

P/C = Market value of equity / Net profit + Amount of Depreciation

4. A MULTINOMIAL LOGIT MODEL

Models of choice are models where dependant variable is qualitative variable. If dependant variable has two values such as 0-1, such models are known as binary choice models.

Multinomial models are choice models used when a choice is required among more than two options. In a multinomial logit model which is one of unordered choice models, dependant variable has more than two options. For example vehicles include bus, train, planes. It is required to have independent options for a dependant variable. Any of these options are not necessarily better or worse than the other, so there is no order or hierarchy among existing options. Therefore changing the location of any option does not have any influence on the results. Evidently, the individual will choose the best for him/herself or prefer the option with highest benefit. Theory that lies behind this choice is theory of random utility. (Lo and Lam, 1997:295)

Properties of options differ among options and may differ based on the individual. Properties of individuals differ among individuals but are the same for all options. Since there is not a full relationship between utility and variables determining utility, utility function includes a random term indicating uncertainty which is a term of error. This model is known as random utility model.

Random utility theory holds that individuals make their decision and choices among options to maximize their utility or satisfaction, subject to probabilistic variation constraints that take into account unobserved attributes of the alternatives, differences in taste and preferences among decision makers ,and uncertainty or lack of knowledge and information. (Lui, :183)

Multinomial Logit Model has been used for financial and economic researches to analyze nominal categorical dependent variables (Vanderhart, 1994;Ardıç and Yüzeroğlu, 2006; Lawrence and Arshadi ,1995; Rahji and Fakayode, 2009; Fontenla and Gonzalez, 2007). Multinomial logit model predicts influence of indicating variables on a dependent variable with an unordered output. Equation no (3) gives Prob(y = j) probability for j = 1,2,…,J-1. So it shows probability of i. individual choosing j. alternative.

$$\Pr op(y = j) = \frac{e^{\sum_{k=1}^{K} \beta_{jk} x_k}}{1 + \sum_{j=1}^{J-1} e^{\sum_{k=1}^{K} \beta_{jk} x_k}}$$

(3)

In the model β has two subscripts. The subscript k separates x independent variables and j separates output categories. The subscript j shows β estimations having J-1 set. In other words, it shows that number of total parameter estimationss will be (J-1)K. The sample volume should be greater than the value of (J-1)K. For example, if there are 10 indicating variables including fixed term and 5 output categories, then the number of total parameter estimations will be 40. Usually the last category of dependant variable is selected as the reference category to be compared to other categories. (Liao, 1994, :48 source Selim, 2008:348).

The only disadvantage of mutltinomial logit model lies in its property known as the independence of irrelevant alternatives (IIA). The feature of independence between alternatives is defined as the ratio of probability in choosing two alternatives being independent from an existing third alternative. Multinomial logit model is based on the assumption of deviations being independent. This model claims that difference ratio indicated as

$$\frac{P_{ij}}{P_{ik}} = \frac{e^{\overline{U}_{ij}}}{e^{\overline{U}_{ik}}} \quad \text{and} \quad \ln \frac{P_{ij}}{P_{ik}} = \overline{U}_{ij} - \overline{U}_{ik}$$

(4)

which is proportional possibility of choosing among j and k alternatives will not be influenced by existence of a third alternative. The Hausman test, as propesed by Hausman and Mc Faden (1984), which is Ki-square test applied to test independency of alternatives compares unrestricted model and restricted model by removing choices for dependent variable. (Green, 2002:724) If the difference among these two models is found to be significant, then such assumption is not valid. Hausman test statistics are presented below.

$$\chi^2 = (\hat{\beta}_s - \hat{\beta}_f)' \left[\hat{V}_s - \hat{V}_f\right]^{-1} (\hat{\beta}_s - \hat{\beta}_f)'$$

(5)

where $\hat{\beta}_s$ and $\hat{\beta}_f$ are the restricted and unrestricted coefficient estimates, and $\hat{V}_s$ and $\hat{V}_f$ are their estimated covariance matrices. This statistic has an approximate chi-square distribution with

the number of degrees of freedom equal to the number of coefficients estimated in the restricted model

4. DATA AND EMPIRICAL APPLICATION

In this study, data collected from 175 companies enlisted in 2006 Istanbul Stock Exchange active in manufacturing sector. We omitted two firms which has zero value in their PB variable. It is aimed to gather data from companies within one sector. The goal here is to avoid negative impact of differences in sectors on the model to be established. Even though variables to be used in the model are calculated in the same way for other sectors except financial sector, averages calculated differ due to unique structures of each sector. Since dissimilarities in sectors may mislead results in terms of consistency in analysis, it is decided to include one sector to be analyzed. Therefore manufacturing industry has been elected for analysis which has the highest number of companies active in Istanbul Stock Exchange.   All of the analyses were conducted using STATA Statistical Software: Release 8.0 The descriptive statistics of explanatory variables are presented in Appendix.

Although manufacturing sector is divided into different sections within Istanbul Stock Exchange, all sub sections are gathered one umbrella of "003000 sector numbered manufacturing sector"[1].

Ownership identity (OWN) which is the dependent variable in the model takes four values as mentioned above. OWN are coded 1,2,3 or 4 OWN variable is labeled as; 1=FAM, 2=HOLD, 3=FOR and 4= OTH. Performance variables are used as independent variable which are ROA, EPS, P/B and P/C. Table 1 shows the number and percentage of categories which we used in the model.

Table 1 : Ownership Identity Variable Values

	Frequency	Percent
FAM	27	15.61
HOLD	94	54.34
FOR	28	16.18
OTH	24	13.87

Primarily validity of IIA assumption is tested by Hausman Test. Null hypothesis can not be rejected. (see Appendix 1)

Multinomial logit model predictions are summarized in Table 2. Since enterprises with foreigners as prevailing partner are a minority in Turkish capital market, foreign companies are chosen to be the comparison group. Also, findings in several past studies indicate that foreign companies have higher performance compared to local companies.

Table 2: Multinomial Logistic Regression Results

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1 List of sub branches for manufacturing industry and enlisted companies in 003000 sector no can be found online at http://kap.gov.tr/Yay/GenelBilgiler/Sektorler.aspx#A3.

	Logit Model 1 (FAM/FOR)		Logit Model 2 (HOLD/FOR)		Logit Model 3 (OTH/FOR)	
Variable	Coeff	Prop:t:>x	Coeff	Prop:t:>x	Coeff	Prop:t:>x
Constant	0,9066*	0,092	2,641***	0,000	0,919*	0,098
EPS	-0,534**	0,014	-0,249*	0,056	-0,427*	0,052
PB	-0,371*	0,089	-0,396**	0,021	-0,305	0,149
ROA	-0,008	0,658	-0,012	0,422	-0,004	0,816
PC	0,011	0,754	0,041	0,230	-0,008	0,816
Chi-Square (12)***	36,53	Prop>Chi-Square		0,0003		
Log likekihod	-187,6218	Pseudo R2		0,0887		

*, **, *** denote rejection of the null hypothesis at the 10%, 5%, and 1% level, respectively

It can be seen that models are statistically significant in %1 level. When analyzed, Table 2 shows that PB variable is statistically significant in the first and second model, EPS variable in all three models. PB variable is statistically significant in first model and EPS variable in third model in 10% level. Other variables are statistically significant in 5% level. An accounting based variable ROA and market based variable PC did not come out statistically significant in any of the models. Therefore these two performance variables do not express or reveal ownership identity.

According to Model 1 results; coefficients of PB ratio and EPS variables are observed to be negative. When compared to foreign company increase in PB ratio and EPS lower the probability of a company to be family company. According to Model 2 results; it is determined that such variables have negative impact on the probability of this company to be a holding enterprise. In Model 3, only EPS variables is statistically significant and has decreasing impact like in the other models.

When model is interpreted through an integrated approach; it is established that significant variables usually increase probability of the company being a foreign one which leads us to such conclusion: Performance indicators of foreign companies such as PB and EPS ratios are higher than other enterprises. In parallel to findings obtained in previous studies such as Goethals and Ooghe (1997), Boardman et al. (1997), Willmore (1986) and Wiwattanakantang (2001) foreign companies are found to be companies with higher performance variables.

3. CONCLUSION

Recent researches shows that the company performance of foreign enterprises had been higher compared to local enterprises. In this study, we search relationship between ownership ıidedtitiy and firm performance by using a multinomial logit model which is investigated the effect of firm performance on ownership identitiy. For that purpose, we use a data set on ISE in manufacturing companies for 2006.

We find evidence in the three model indicating that the four types of ownership identitiy are explained by EPS and PB. Taking foreign companies as a comparison group these variables have negative impact on the other three types of ownership identities. Rational investors prefer to invest in higher performance companies. Since demand will increase for stocks of higher performance companies, the value of such companies will increase too. According to the model when investors invest in foreign companies as a result of such investments probability of obtaining revenues is higher compared to family owned and holding enterprises.

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APPENDIX
Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
PB	173	1.690902	1.761433	.01	14.47869
EPS	173	1.053688	9.036693	-36.39	105.9829
PC	173	8.900921	7.625318	.5637446	57.23963
ROA	173	1.09645	18.98502	100.2695	57.81105

Hausman Test Results

	Variable	b	B	(b-B)	Standart Error
Model 1	ROA	0.0286913	0.0207903	0.0494816	0.0292809
	PC	0.0072745	0.0142488	-0.0069743	0.0200592
	EPS	-1.303524	0.4950736	0.80845	0.5157275
	PB	-0.4043694	-0.4073462	0.0029767	0.1567872
	Constant	1.110166	0.878769	0.231397	0.2494913
Model 2	ROA	0.0262758	-.0092729	0355488	.0270434
	PC	-0.0201624	-0.0102048	-0.0099576	0.0197954

	EPS	-0.9629752	-0.39974	-0.5632352	0.4419173
	PB	-0.270771	0.872358	0.2088426	0.2293677
	Constant	1.081201	0.872358	0.2088426	0.2293677

b = consistent under Ho and Ha;   obtained from mlogit
B =   inconsistent under Ha, efficient under Ho;   obtained   from
mlogit

Test: Ho: difference in coefficients not systematic

$$chi2(10) = (b-B)'[(V\_b-V\_B)^{\wedge}(-1)](b-B)$$
$$=   8.77$$
Prob>chi2 =   0.5544