

Erasmus University Rotterdam,
Erasmus School of Economics
M.Sc Accounting, Auditing and Control

Master Thesis

**Corporate Ownership Structure, Managerial Ownership and Firm
Performance: An Empirical Analysis of the U.S Market.**

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15th June 2012, Rotterdam

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Chapter 1

Introduction

Corporate ownership structure is an important subject, in the field of Corporate Governance and a vast literature exists, that tries to explain the different ways it can be treated.

This paper is a Master Thesis concerning a study of the relationship between the ownership structure and firm performance, for U.S firms quoted in the S&P 500 index. Although this “controversary” relationship is broadly investigated for several markets, there is always room, for more evidence especially when it concerns the U.S market.

According to the Neo-classical Theory in firms the motives and incentives, were drawn from the urge to maximize the wealth of the shareholders. Taking this into account, managers, CEOs, board-members and every stakeholder , in general, with active contribution to the decision-making ,were taken into account as a whole, whose interests were in alignment with those of the shareholders, in the maximization of the performance-value, direction of the firm.

During the years, and through the evolution of the economies and business cycles, organizations changed dramatically. The expansion of firms along with their operations in capital markets, led to the fragmentation of their shareholder structure.

As a consequence, of the fragmented ownership, was the transformation of their ownership structure and corporate governance. The concept, of the ownership as we used to know it was abandoned, since under these conditions the administration and ownership of the organizations, was a multi-dimensional whole, of shareholders and stakeholders with different interests.

Nowadays, this model of corporate ownership is generally accepted to be a necessity, for the survival of a firm.

This diversification , of “administration” and ownership, lead to a structure, were the control of the firm is being exercised not through the owner, but through the administration of the firm. Since this change, the decision-making, and furthermore the control of the firm, is the result of the cooperation between two different groups of

people the owners-administrators and managers, who through this transformation have become also “partly-owners” since they own shares in a firm too. To this point though these two general groups have both motives, incentives and goals in the same corporation.

Consequently the question that arises, now is: Are these motives and incentives, of these two groups in alignment ?

In other words if this diversification of these corporate roles, leads to different goals, then the inner-conflict that arises, can lead with its turn to deviations from the main role of the corporation, which is the maximization of shareholders wealth, and consequently better firm performance. Another important parameter that we should bear in mind (when dealing, with corporate structure in general) and which can influence, the motives-incentives of each group of interest, in a firm is the “position” and relation of this group with the management of the corporation.

For example, we can think of the CEO of a company. The position that he/she holds in a company is vital for every stakeholder. Actually the CEO is the head of the whole management. It is very common in modern corporations to reward Top management for high performance with stock-based compensation plans. With this action the CEO can be simultaneously characterized, as a shareholder, but also a manager. In this case the CEO acquires a dual-identity in the corporation.

This aspect of the dual-identity of managers is a topic that has far concerned also the literature of Management Accounting and Control, always from the point of view of top-executive compensation.

The problem with this duality of nature deriving from the Agency Theory has to do with the inner motives of each part of the dyad. The one, as shareholder seeks maximization of wealth via overall firm performance, but the other part is driven by the maximization of self-wealth, without considering the firm performance in the long run. In the presence of these differences the outcome of the business circle of a firm can vary significantly from the expected one.

Taking, all the afore mentioned under consideration we realize that the problem raised through the question earlier, can be generalized for the corporate ownership structure and the identity of each stakeholder with or without ownership.

The final outcome of this co-existence on the firm performance depends on the degree each group of interest can pass and impose control through decisions concerning their goals. Here I must denote that in order for such research to be carried out we must specify that the degree of control in a modern corporation depends on the percentage of ownership each group holds.

To this end the following generalized research question can be formulated:

“Is there a relationship between the corporate ownership structure components and firm performance, for large U.S firms?”

The rest of this Master Thesis, will be structured as follows:

In Chapter 2 I will further motivate the research question. Chapter 3 contain the theoretical overview on the subject. In Chapter 4 I will conduct a literature review in which the methods of measuring and results of other studies will be discussed. In Chapter 5 I intend to further analyze the hypotheses, set the variables used in my research, analyze the model and the research method I intent to use, and provide information about the sample and data I will used. In Chapter 6 I will present the regression results of my analysis and finally, in Chapter 7 I will conclude, by further analyzing the results of my study and also by commenting about limitations and further research on the specific subject. Chapter 8 will be the Appendix of my study.

Chapter 2

Motivation of research question

The pursuit of the relationship between Corporate Ownership structure and the firm performance is a field of fruitful research not only for academic purposes but also it can provide vital information and shed more light into the way modern corporations operate nowadays. The subject on its own is very interesting because it incorporates different tensions and interests within a corporation. In addition concerning this subject there are some more other interrelations that accompanied it. For example in the field of management accounting and control one could rise the relation of stock options and CEO compensation and relate this with firm performance and Ownership structure along with control.

Despite the fact that a rich scientific research, has emerged in the international literature concerning this subject the past decades, I think there is still room for further inspection, due to several factors which so far have slowed down the flow of information on the subject.

Controversary results of prior research

In the vast majority of the literature, most of the researchers highlight the limitations of their approach and suggest further research at the analyzed topics. A lot of other factors also contribute to this, such as different methods and approaches due to the lack of a unifying model through which the topic could be investigated more efficiently. It is very important also to highlight that the results on the subject are also very contradicting, with researchers not being able to reach unifying results.

Differentiation of Markets

The results of prior research have shown great differences concerning the markets, where the analysis take place. Here I must add that the different characteristics of each market, such as regulation for example, can be the main reasons why prior results cannot be broadly generalized. Considering this, any new research on the topic could shed more light and provide unique information with respect to the sample, market, variables and definitions of each researcher.

Chapter 3

Theoretical Overview

In this part I will attempt a theoretical approach of the subject: Corporate Ownership Structure and firm performance.

3.1 Control through Ownership, based on Agency Theory.

3.1.1 Agency Theory

The matter of differentiation between corporate ownership and control was taken into account under the difference of the interests between managers and owners in corporations were the dispersion of ownership percentages and the structure of inner-governance have led managers to act as agents of the owners-shareholders.

This has led to the creation of behavioral and managerial theories concerning corporate governance, according to which the owner-manager, who acts to the best interest of the shareholders -and their wealth maximization- hands in his position to a manager who act driven from his personal maximization of wealth.

Berle and Means (1932) were the first to draw attention to the fact that control and ownership were not treated anymore as a whole, and this was a consequence of the expansion of corporations.

This difference between owners (principal) and managers (agents) resulted to the creation of mechanisms for monitoring and control, from the side of the owners (principals). These mechanisms are known as agency costs. On the other hand, the existence of agency cost leads to the decrease of wealth of owners-shareholders and also the decrease of the firm's performance.

The question here is why are the owners-shareholders (principals) willing to let this transition take place when they already know that it is in contradiction with their interests.

The answer is because managers have become so necessary to the modern corporation through their role and position, and also because their effect can be mitigated through the correct implementation of control mechanisms created, either from the corporation they operate into, or the market.

3.1.2 Transition from the “old” administration structure towards the control of managers.

The way managers have gained ground in the modern corporation seems to be following the evolution of corporations through time.

According to Jensen (1986), managers have motives to enlarge the firm beyond optimal size, because in the expanded corporation, their control increases and so inevitably their own position inside the company. Additionally another opinion, according to Murphy (1985) is that the increase of the firm size, is related to their compensation pay since managerial compensation is related to sales increase. Another point of view is the one of Shleifer and Vishny (1989). Based on what they add into literature, managers can choose specific investment plans for the company they work, in order to make themselves irreplaceable, serve their interests via higher wages and this also gives them a competitive advantage in the creation of corporate planning against other shareholders and the board of directors.

Here we must say that this transition is a bit “violent” if the term can be used correctly in this occasion. What I mean is that through their operations in a corporation they can use information and resources in order to “gradually” alter the balance of control to their side, and make this transition “violent”.

3.1.3 Control of managers.

In order to control against managers, a lot of suggestions have been made. In some occasions the alignment with ownership interests can be achieved, but this is not always the case. Some of these suggestions work as mechanisms to solve the principal-agent problem.

Fama and Jensen (1983), suggest monitoring of managers, from the board of directors. Stiglitz (1985) point out the competitive market of top-executives. Another way to achieve this, could be the way in which manager wages-compensation is created. [Grossman and Hart (1983) and Fama (1980)]. To this point we must add that in the literature some researchers, have taken into account, the aspect of takeovers as an exogenous way of control over managers in which the “fear” of a violent takeover can work as a mechanism of reducing their own personal interests.

Another proposition made by Stiglitz (1985), for the matter of control over managers was the creation of certain mechanisms from the creditors –shareholders/banks- of the company. Again here these mechanisms cannot be very effective and efficient concerning their purpose, firstly due to problems caused by information asymmetry between shareholders and managers, and secondly because a bank (creditor) would primarily care into collecting the money invested without any consideration if the money were spend correctly, in order for better performance to be achieved and by all means maximization of the shareholders wealth.

Based on all the afore mentioned , it is easy to understand that the problem is no more a principle-agent problem in modern corporations, but rather a multi principal- multi agent matter.

3.2 Mechanisms through which control is exercised in a corporation.

If we take into account the problems deriving from the differences between managers and owners- shareholders, one big question is how each group of interest could exercise control within a firm.

According to Fama and Jensen (1983), the decision making in a firm is a process with 4 stages/parts namely a)initiation, b)ratification, c)implementation, d)monitoring. They suggest that control, doesn't need the participation of a group of interests in the day-to-day management. The desired control can be accomplished and exercised through the choice of management.

This lead me to the categorization of companies, to owner-controlled and manager-controlled, based on the percentage of shares each identified group holds.

Berle and Means (1932), made a distinction between companies according to the way corporate control was exercised, into 5 different categories.

Private owned firms: where one person or family holds at least 80% of shares with voting rights.

Majority owned firms: where one person holds shares with voting rights, at a percentage between 50%-80%.

Legal device and Minority controlled firms: where the percentage of shares with voting rights, held from a person is between 20%-50%. The control is being done via minorities or strategic alliances.

Management controlled firms: in this category the diffusion of the ownership percentage is very high and the control is being done through managers.

We must though note here, that in their study they don't take into account managers that have ownership percentages so the dual-identity nature of a part of managers is excluded. In the literature concerning this matter, a lot of different theories have been suggested by researchers about how the different percentages can influence control in a corporation.

At the end all the different approaches led to one "simple" estimation, which is that control in a corporation is primarily defined by the degree of concentration of ownership percentages each group that seeks control owns. In other words in the modern corporations as we experience them now, control is actually based on the diffusion of ownership.

At this point we must consider that along with control also derives the outcome of the business cycle of a firm which is incorporated on the firm's performance, which with its turn is one of the most important aspects of modern entrepreneurship.

3.3 The identity of the different groups of interest.

Inside corporations we can identify different groups with different motives, goals and ownership percentages. Here I will try to briefly analyze their identity and motives.

Managers: In this category managers can be identified with small or without ownership percentages. As I noted earlier in this paper, managers tend to serve their own wealth maximization, something that influences their decisions and can make them "myopic" in decision making, which in turn can lead to severely influence the firm performance. Someone could argue that this short-term motives of management can serve shareholders as well, but still in the long-run the latter are the ones that can be more damaged from myopic decisions made by management.

Insiders or managers-owners: This category includes groups-of interest, who can influence the decision making within a corporation through their physical representation in the board of directors, of a company.

According to Jensen and Murphy (1990), it is suggested that in order to solve the differences between incentives/motives of owners-managers and the rest of the shareholders, the level of ownership of the management should be kept high (but balanced) because, as it increases more possibilities exist that their motives and interests could be in alignment with the rest of the shareholders.

Blockholders: In this category are included shareholders with a rather big proportion of ownership percentage, without taking into account if they are outsiders or insiders in a corporation. In other words internal or external to management.

Stiglitz (1985), gives them the role of some kind of ‘controller’, because they can bare the agency-cost of managers. Note here that their motives might not be in alignment with the other shareholder groups.

Institutional Investors: This is another group of shareholders, external to management, who usually hold a quite large proportion of shares in a company. Their rise in modern economies has led a number of researchers, to investigate their role in modern corporations and how they can influence firm-performance. (The elaborations on the theories and empirical results concerning this group of shareholders is out of the scope of this Master Thesis, for the present moment, even if their role might be important). In my Master Thesis I will explicitly take into account the Insiders/managers-owners and the proportion of ownership the hold inside a firm.

Chapter 4

Literature Review Part A - B

In this Chapter as I had mentioned earlier I will try to conduct a literature review discussing the results and models used by other researchers on the subject of ownership structure and firm performance. This will be Part A. In the second part of literature review, Part B, I will briefly elaborate the main measures used for firm performance, as found in the literature.

4.1 Literature review Part A

Demsetz (1983), Demsetz and Lehn (1985), supported the notion of endogeneity, between ownership structure and firm performance. Demsetz (1983) also argues about the relationship of the latter and ownership diffuseness.

This endogeneity issue, that was brought up from Demsetz is very important, when researching the relationship of ownership structure and performance. He also argues that passing the control into managers, from owners wouldn't take place if they couldn't still control them. I think this is essential because the decentralized corporation as we know it, at the end might not be so decentralized.

After Demsetz work, a lot of research studies on the topic further investigated the issue of endogeneity when measuring ownership structure.

Mork et al.(1988) also proved that between, management ownership and market valuation, a non-monotonic relation exists. In their sample of Fortune 500 firms found a significant relation concerning Tobin's Q (measured to capture firm performance) and ownership structure. However, this relation was proved to exist only for rather low and rather high percentages of ownership.

Additionally, McConnell and Servaes (1990) when examined the relation of Tobin's Q and structure of equity ownership, reported in their results that for insiders and institutional investors, "a curvilinear relation" of them and Q existed.

In another study, the one of Chung and Pruitt (1996), when they use simultaneous equations model on panel-data from 1987, the idea that executive CEO stock ownership and firm's market value as measured by Tobin's Q is found related and

supported. They also incorporate the fact of endogeneity between their investigated variables.

Loderen and Martin (1997), conduct their research, and seek relation between managerial ownership and Tobin's Q, for some acquisition cases. The use of simultaneous equations model, is considered in order to deal with the endogeneity issue, of the subject. Their results provide evidence that insider ownership is related with Tobin's Q. On the other hand, their evidence is not supporting that Tobin's Q affects insider ownership.

Another study that investigates ownership structure, investment, and corporate value done by Cho (1998) provides evidence, to support, that ownership structure is affected by corporate value, but not the other way around.

Short and Keasy (1999), also found a non-linear relation between firm performance and managerial ownership for UK firms. They measured performance not with Tobin's Q, but with RSE return on shareholder's Equity and valuation ratio. (Market value of equity to book value of equity, both at the end of the accounting year.)

So far most of the studies that followed the one of Demsetz are giving evidence and support, to an extent, on the suggestion that the relationship between ownership structure and firm performance is endogenous.

Another research carried out by Palia and Lichtenberg (1999), which investigated manufacturing firms in the US, seek to find relation among productivity, measured from the scope of firm performance, and managerial ownership on the other side. Their reported results prove a positive relationship between managerial ownership changes and changes in productivity.

The work of Demsetz and Villalonga (2001) at this point tries to address both the endogeneity issue and the diversified dimensions of ownership structure, when related to firm performance. Their results concerning US firms, report that no relation is found between ownership and performance. They measure performance both with Tobin's Q and accounting profit rate, but none is found related to any kind of ownership as defined and measured in their paper.

On the other hand, Welch (2003) when applied the same model of Demsetz and Villalonga to an Australian set of listed firms, with a single equation model, she reports a positive relationship between ownership and performance. When she applied for the same set of firms a 2-equation model, no evidence of a relation was found.

Further, as I continued with the literature I found the article of Villalonga and Amit (2004) where they are trying to find the relationship between family ownership and performance. Using data taken from Fortune-500, and concerning the years 1994-2000, they report that family ownership is related to performance only via specific combinations of control.

Karathanassis and Drakos (2004), researched equity ownership and corporate value for a rather small sample of Greek listed companies, and for the years between 1996-1998. Using time series and cross-section data explored the relationship between Tobin's Q and ownership structure, measured by managerial ownership. Their evidence from the results did not indicate any significant relationship. On the other hand though, they reported that a positive relation existed between institutional investors and corporate value, supporting the efficient monitoring Hypothesis.

Sheu and Yang (2005), carried their research on insider ownership and firm performance in terms of productivity in a sample of 416 Taiwanese firms. They conclude that a U-shaped relationship exists when they focus on the executive/insider holding ratio along with productivity. The results provided them with a hint in order to conclude that, ownership of top-executives of high-tech firms tend to "enhance" firm productivity.

More recently Kapopoulos and Lazaretou (2007) investigated corporate ownership structure and firm performance measured by profitability of firms. A sample of 175 Greek listed firms was used and the interpretation of their results revealed that for the year-firm selection that a more concentrated ownership structure led to higher firm profitability.

Finally Drakos and Bekiris (2010) researched the relation between managerial ownership and corporate performance. They applied a simultaneously equation framework on a panel of 146 Greek listed firms for the years 2000-2004. Their empirical results urged them to conclude that managerial ownership was related with

corporate value. In their research they took also into account the endogeneity issue. It is easy to understand at this point that when dealing with such a complicated subject is very difficult to generalize results, but despite that fact the information provided to other researchers is valuable, in order for them to realize, understand different approaches, mistakes, limitations, and in general difficulties derived from this particular but also very interesting subject. To this end the table below presents and summarizes the most influential articles that I used in order to realize my Thesis.

Table 1: Influential Literature Review Summary.

Article	Variables		Method	Outcome
	Dependent	Indipendent		
Jensen et al. (1992)	dept Ratio, divident policy, insider ownership	fixed assets, business risk, R&D, profitability, growth, investment, size of the firm	system of equations, 3SLS	Higher ownership firms choose lower levels of dept and dividends.
Agrawal and Knoeber (1996)	Tobin's Q	Insider, Institutional shareholdings, blockholdings, Board outsiders, leverage, R&D ,log_assets, CEO human capital	OLS, 2SLS (U.S Market)	Greater insider ownership was positively related to performance.
Cho (1997)	Insider ownership, corporate value, investment	Market Value of common equity, Corporate value, Investment, volatility of earnings, leverage, asset size, industry, insider ownership	OLS (Fortune 500 firms)	Corporate value affects ownership structure, hint that ownership structure is endogenously determined.
Loderer and Martin (1997)	Tobin's Q	log_sales, shareholdings of insiders and all officers/directors, shareholdings of Institutions.	Simultaneous equations framework and single equations (U.S Market)	No evidence that larger shareholdings lead to better performance, and Higher ownership might multiply opportunities for corporate wealth.

Short and Keasy (1997)	ROE ,Valuation Ratio	Managerial ownership, institutional investors, external shareholders, firm size, firm growth, dept, R&D expenitures	OLS (U.S Market)	A non-linear relationship between firm performance and ownership exists.
Demstez and Villalonga (2001)	Tobin's Q, man_ownership	leverage, ln_assets,profit rate, advertising to sales and R&D to sales ratio, industry concentration, ownership concentration	OLS, 2SLS (U.S Market)	Negative relationship appears between ownership and performance
Fenn and Liang (2001)	divident payout ratio, repurchase ratio, management shares and options	Leverage, net operating cash flows to assets, market-to-book assets, log_assets, volatility of operating income to assets	Four separete Tobit regression models (U.S Market)	Strong negative reallionship between dividents and managerial ownership stock options, and a positive rationship between repurchases and management ownership stock options.
Kapopoulos and Lazaretou (2007)	Tobin's Q important shareholdings , managerial shareholdings	Prate, dept, firm size, distribution-to-sales ratio, industry concentration (CR4 and Hindex)	Simultaneous equations with OLS (Greek Capital Market)	Concentrated ownership structure relates positively to higher firm profitability.Higher firm profitability requires a less diffuse ownership.
Drakos and Bekiris (2010)	Tobin's Q , managerial ownership	ln_assets, divident payout ratio,standard diviation of monthly stock returns, leverage, external, outside, family ownership, institutional investors.	Simultaneous equations, OLS, 2SLS, 3SLS (Greek Capital Market)	When managerial ownership is treated as endogenous there is a positive impact on corporate value.

4.2 Literature review Part B

In the accumulated literature so far, a lot of different measures are used in order to measure the firm performance. Mainly the broadness of the measures in the hands of a researcher concerning firm performance can be proved by the fact that both accounting and economic ones can measure it.

My intension is to categorize some of them and briefly present them, in order to provide further evidence and information, concerning my choices, further in this Master Thesis.

To begin with, and always concerning Firm performance measures one of the main arguments against the accounting ones is that the results can be manipulated. Despite the fact that the economic ones can be considered as more representative, their relation with accounting ones is inevitable, so problems of the same nature can rise.

Furthermore, I must add that, in the case where performance indicators of a firm are considered to be expressed better through the market value of its shares, then we must silently accept the hypothesis of the “efficient capital markets”. This hypothesis though does not always apply to all capital markets. In the case though of the U.S market now we must take into account that the capital market is efficient and everyone shares the same information at the same time.

4.2.1 Market measures:

Valuation Ratio: Is the ratio of market value of the company (as indicated, by multiplying the price of common stock and the total number of ordinary shares with voting rights) to the Book Value per share at the end of the year.

$$VAL = \frac{P_C \times N_C}{BV}$$

¹Where

VAL : Valuation ration
P_C : Price of common stock
N_C : Total number of ordinary shares with voting rights
BV : Book Value per share

¹ [Short and Keasy (1997)]

Stock Market Rate of Return and more specifically:

Average Monthly Stock return: Is computed, based on the average of the monthly stock returns, taking into account the paid dividend.

$$AVMSR = \frac{\sum_{v=1}^{12} \frac{P_v - P_{v-1} + D_0}{P_{v-1}}}{12}$$

²Where :

A.V.M.S.R : Average Monthly Stock Return
P_v : Price of the stock the last day of the month v
P_{v-1} : Price of the stock the last day of the previous month v-1
D₀ : The dividend pay on a predetermined month

Tobin's Q ratio: The Tobin's Q ratio at first developed from Tobin and Brainard in 1968, and improved by Linderberg and Ross in 1981. Is the ratio of the firm's Market Value to the replacement Cost of its Assets. In this analysis I use the Approximate-Tobin's Q as developed from Chung and Pruitt (1994), and Perfect and Wiles (1994) which needs only basic accounting measures, in order to be calculated.

$$TQR = \frac{VAL_c + VAL_p + Debt}{TA}$$

³Where :

VAL_c : The market value of common shares at the end of the fiscal year
VAL_p : The market value of preferred shares at the end of the fiscal year
Debt : Book value of total liabilities (short and long-term) at the year end
TA : Book Value of total assets at the end of the fiscal year

² [Demsetz and Lehn (1985)]

³ [Mork et al. (1988), McConnel and Servaes (1990)]

4.2.2 Accounting measures:

Accounting Rate or Return on Equity (ROE): It is one of the most widely used variables, in order to measure firm performance. It is defined as the ratio of Net Income to total equity.

$$ROE = \frac{N.I.}{T.EQ.}$$

⁴Where :

ROE : Return on Equity
N.I : Net income
T.EQ : Total equity

Return on Assets (ROA): It is defined as the ratio of net income to book value of total assets at the end of fiscal year.

$$ROA = \frac{N.I.}{T.AS.}$$

Where :

ROA : Return on Assets
N.I : Net income
T.AS : Book value of total assets at the end of the fiscal year

Earnings per Share (EPS): It is defined as the ratio of net income minus the dividends paid of Preferred stock to the average of outstanding shares at the end of the fiscal year. This is also another common measure in order evaluate firm performance.

$$EPS = \frac{N.I - Div.Paid\ on\ Pref.Shares}{Av.Outstanding\ Shares}$$

⁴ [Mork et al. (1988), Keasy and Short (1997)]

Where :

EPS : Earnings per Share

N.I : Net Income

Div. Paid : Dividends paid on preferred Shares

Av. Out. Shares : Average Outstanding Shares.

These are some of the measures used by other researchers in the previous empirical studies concerning the firm performance. As I mentioned earlier, these measures are the most common ones that a researcher can use in an empirical study and additionally the most used ones.

Chapter 5

Hypotheses, Variables, Research Method, Model and Data

In this chapter my intention is to identify what exactly I will try to measure, set my hypotheses concerning ownership structure and firm performance and my variables - dependent and independent ones. Additionally, I will provide information about the data and sample I intend to use, but also I will elaborate on the model and my research method.

5.1 Hypotheses

When dealing with a subject where more of the empirical results are controversial it is hard to formulate clear Hypotheses, but my main intentions through this Thesis is to investigate if a relation, positive or negative one, appears between managerial ownership defined as insider CEO ownership and the firm performance as measured by the Approximation of Tobin's Q. Furthermore, I would like to conclude through my findings if this relationship is influential or not in general on firm performance.

Based on the literature review conducted in the previous chapter the relation connecting firm performance and ownership structure is not the simplest one. To this end I will try and formulate the Hypotheses for my Thesis. My first hypothesis then will be:

H₁ : Executive ownership is a negative function of firm performance as measured by the approximation-Tobin's Q.

Demstezt and Villalonga (2001), in their study bring evidence that such a negative relation does exist in their sample.

Since from the beginning we argue that between these two variables an endogeneity issue exists I am hypothesizing that the same negative relation will exist for the firm performance equation too.

H₂ : Approximation-Tobin's Q is a negative function of executive ownership.

These two will be the main hypotheses in my model but furthermore I am planning to use a variety of other variables such as leverage, dividend policy, the size of the firm and net income in order to capture other determinants of the relationship in study.

To this end and based on the findings of Demsteez and Villalonga (2001) along with Drakos and Bekiris (2010), I expect to find a negative relation between the size of the firm, ownership and also firm performance. If we consider that the larger a corporation is, we can expect management from all tiers to hold a bigger proportion of shares, either through compensation plans or in an attempt to create a better position inside the corporation as far as it concerns its control and their position. I expect this to be positive for the case of CEO ownership. So the third hypothesis could be formulated as follows:

H₃: There is a negative relation between the size of the firm (lnAssets), CEO ownership and the approximation of Tobin's Q.

Furthermore in my analysis I take into account the dividend policy of the firm. This aspect in my opinion is really important because based on the case that a firm has good performance, the dividends which mainly are affected by it, can benefit all the stakeholders of the company. Taking this into account and combining it with the case where a CEO already holds shares could be the perfect vehicle, in order to be related not only with performance but also with better and more control within the corporation. Dividends in times where performance is high are usually a continuous "cash flow" for all stakeholders. Here though I have to mention that so far from the research done concerning dividends ownership and Tobin's Q a negative relation is appearing to be present Jensen et al. (1992), Fenn and Liang (2001) and Drakos and Bekiris (2010). It only remains to see if this negative relation will be present also in my sample of companies. So the forth hypothesis should be:

H₄ : A negative relation exists between the dividend policy of the firm (divp), CEO ownership and Tobin's Q.

At this point I must turn my attention on other variable in my study which is leverage (debt to assets). The use of leverage is in order to catch for other effects on the ownership-performance relation and especially the effects of debt holders on it. I am expecting leverage to be negatively related with both Tobin's Q approximation and CEO ownership.

Demsetz and Villalonga (2001) address this variable, considering it important not only for its relation with the debt policy of the firm but mainly because they argue that the creditors of the firm may affect management by better adding to the monitoring process inside the firm. This can be true if we take into account that with better monitoring managers would have less opportunities to entrench their position even more via share ownership. Furthermore Drakos and Bekiris (2010), reported a negative relation between leverage, ownership and performance on their selected sample. Consequently my fifth hypothesis will be:

H₅ : A negative relation exists between leverage (debt to assets), CEO ownership and Tobin's Q approximation.

Finally the last part of my hypotheses setting is more an intuition that net income affects both the main variables in my study. I base this assumption on the fact that the better and higher the net income is, this denotes a better firm performance and through this achievement, share ownership and especially CEO ownership could be altered towards higher percentages of ownership. On its turn this could affect the relation between ownership and performance. If we also take into account some aspects from management accounting such as compensation plans in higher tiers by achieving better actual performance, then this intuition could be true.

Additionally Ke et al. (1999), on their article about ownership concentration, sensitivity of executive pay and accounting performance measures, suggest that for closely-held companies executive pay (CEO compensation, thus also ownership) is less based on accounting performance measures.

Since the companies in the sample on my Thesis are not closely-held I can assume that a positive relation might arise between CEO ownership and net income. To this end the last hypothesis then will be:

H₆ : Net income (net_income) is positively related with CEO ownership.

In the next section of this chapter I will analyze and provide the appropriate variables definitions used during the procedure of the empirical results.

5.2 Variables.

The most important variables in my Thesis and consequently the key ones are for corporate ownership structure: insider ownership as defined by the percentage of shares owned by the CEO of the company, with voting rights. From now on this variable will be described as AvManOwn.

I tried not to neglect also some other aspects and perspectives of ownership structure and I also included the percentage of shares owned by the board of directors of the company, with voting rights, this will be AvALLOWn.

For the firm performance now, is the approximation-Tobin's Q defined as the market value of the firm at the year plus the total debt of the firm to total assets. This will be AvlnTQ. To this end ROE was also studied but for purposes of comparison with the approximation-Tobin's Q. Their interrelation can be seen in the Appendix through the correlation matrix between all the variables in the models of this study.

Other variables that I took under consideration in this research are the following: **ln_assets** which represents the size of the firm, **net_income**, **divp** which is the dividend policy, **debtoas** meaning and representing the leverage of the firm.

In Table 2 which follows, I elaborate all the definitions, symbols and the sources for all the variables used both in the model and in the following analysis.

Table 2: Definitions of variables

Variable	Definition	Source
AvManOwn	Average Percentage of shares with voting rights owned by the CEO of the company, for the years between 2005-2010.	ExecuComp
lnAvTQ	Log of Firm Performance measured by the approximation-Tobin's $Q=(TMV+DEBT)/TA$, TMV total market value of the firm taking into account the market value of common, preferred stocks. DEBT the year end book value of total liabilities of the firm. TA the company's year end book value of total assets. The variable is averaged for the years between 2005-2010.	Compustat
debtoas	The firms year end book value of Total liabilities to Total Assets.	Compustat
divp	The dividend payout ratio of the firm. Defined as annual total dividends to the earnings per share.	Compustat
lnAssets	Natural log of Total assets.	Compustat
net_income	The year end net income of the firm in U.S dollars.	Compustat
AvALLOwn	Average percentage of shares with voting rights owned by the board of directors of the company, for the years 2005-2010.	ExecuComp
lnAvROE	Natural log of the average of return on equity defined as net income to total equity of the firm for the years 2005-2010.	Compustat

After having thoroughly studied the article of Demstetz and Villalonga (2001), I used the same approach concerning the firm performance and ownership measures in my Thesis and I created time demeaning variables by using the average for the years between 2005-2010. Additionally in some variables namely **lnAvTQ** and **lnAvROE**, I used the logarithmic transformation by replacing the actual values of them with their natural logarithms, in order to correct for their skewdness.

5.3 Research method.

There is an issue that arises and is the one of endogeneity between the performance of a firm and the ownership structure of it. Based on this and after the study of Demstev (1983) that first argued about this problem taking it into account is very important.

I applied a simultaneous equation model in order to solve the problem of endogeneity. This technique the past recent years is being selected by the majority of other researchers for example Drakos and Bekiris (2010). The two equations will be further analyzed in the next part of this chapter. Furthermore the methods with which I intent to make my estimations using three different types of estimators which namely are 3SLS, 2SLS and finally OLS.

My intention is to use all of these methods for comparison reasons mainly due to the fact that all have different advantages and disadvantages. My main importance will be on the 3SLS econometric methodology.

The further analysis of the advantages and disadvantages of all these methods are mentioned in the Appendix D of my Thesis under the title of Statistical Approach. In this chapter of my Thesis I will attempt to make a quick theoretical approach on the subject.

To begin with a quick elaboration first I checked in my sample for the endogeneity issue by implementing the Hausman Testing methodology. From which I found that the main ownership variable of managerial ownership is of an endogenous nature with the performance variable namely the approximation of Tobin's Q. Further I continued with the specification of my model which is analyzed in detail in the following paragraph, where also the variables are introduced to the model.

5.4 Model

When trying to investigate corporate ownership structure and control along with firm performance, it is very important, as elaborated from the literature review, to bare some factors in mind.

The first issue is the one of endogeneity, while the second is the variable definitions and both of them can lead a researcher to possible misinterpretations of the empirical results obtained from his research.

After the study of Demsetz (1983) when endogeneity was first introduced in the literature of the ownership-performance subject, most of the following studies and researchers encountered it. In order to solve this problem most of the researchers use simultaneously equation models, Loderer and Martin (1997), Demsetz and Villalonga (2001). My intention is to do so myself, based in a similar model with the one of Drakos and Bekiris (2010).

In the literature (as I indicated earlier in the literature review) the two most used measures for firm performance are accounting rate (ROE), and the Tobin's Q. The latter is used in the majority of the studies conducted so far on the subject. Between these two measures there are specific differences.

One is forward looking (Tobin's Q) and the other is backward looking (ROE). These differences are in alignment with the nature of each one of them. In my thesis I will use the approximation of Tobin's Q as determined by Chung and Pruitt (1994) and Perfect and Wiles (1994), mainly because it needs basic financial information in order to be calculated.

Both of these measures can have implications due to the fact that are determined by accounting features. Tobin's Q-Approximation, from the book values that in encounters and the accounting rate because it is purely accounting determined. I am pointing these aspects because accounting measures can be influenced by different accounting practices within corporations.

Accounting for the agency literature, I chose the approximation of Tobin's Q ratio as depended variable Agrawal and Knoeber (1996), Demsetz and Villalonga (2001).

The approximation-Tobin's Q, will be the key variable measuring firm performance. The accounting rate (ROE) will not be used in the regressions in my models but I take it under consideration as a measure of firm performance, mainly for comparison reasons.

On the other hand, the key variable in order to measure corporate ownership structure will be managerial ownership of the highest tiers in corporations defined as the percentage of stock held by inside directors of the board and especially CEO ownership.

The model of the simultaneously equations I intent to use would then be:

$$\begin{aligned} \mathbf{Own_Str}_i = & \mathbf{a}_0 + \mathbf{a}_1\mathbf{Firm_Perf}_i + \mathbf{a}_2\mathbf{ln_assets} + \mathbf{a}_3\mathbf{divp} \\ & + \mathbf{a}_4\mathbf{debtoas} + \mathbf{a}_5\mathbf{net_income} + \mathbf{e}_1 \end{aligned} \quad (1)$$

$$\begin{aligned} \mathbf{Firm_Perf}_i = & \mathbf{b}_0 + \mathbf{b}_1\mathbf{Own_Str}_i + \mathbf{b}_2\mathbf{AvAllOwn} + \mathbf{b}_3\mathbf{ln_assets} \\ & + \mathbf{b}_4\mathbf{debtoas} + \mathbf{b}_5\mathbf{divp} + \mathbf{e}_2 \end{aligned} \quad (2)$$

Where $\mathbf{Own_Str}_i = \mathbf{AvManOwn}$ and,

$$\mathbf{Firm_Perf}_i = \mathbf{lnAvTQ}$$

At this point I should underline that before analyzing further the variables and the reasons for whom I made this selection, I need to mention that , in order to determine that the $\mathbf{AvManOwn}$ variable was endogenous I conducted the exogeneity test developed by Wu (1973) and Hausman (1976). Indeed the variable was found to be endogenous. The reported outcome can be found in Table 3-Panel_b.

As denoted in Drakos and Bekiris (2010) a lot of empirical studies have taken managerial ownership as the endogenous variable after considering the way modern corporations operate nowadays, but also the way managerial ownership is related to compensation plans led most of the previous researchers to make a rather ad hoc consideration as far as concerns the endogenous nation of ownership variables.

To this end the statistical analysis conducted in order to come to this realization is a test due to Wu (1973) and Hausman (1976), whose null hypothesis states that the OLS estimates are consistent. The alternative one states that OLS estimates are not consistent and therefore in order to estimate the parameters of the equations someone needs a more consistent estimator such as 2SLS or 3SLS. In the case that we are unable to reject the null Hypothesis then it is implied that the other estimators are also consistent and the variable test is exogenous. In the case we reject the null hypothesis it is implied that correctly we used a more consistent estimator because the variable in question is endogenous.

I applied this exogeneity test to equation (2) for the $\mathbf{AvManOwn}$ variable. The first step was to regress the managerial ownership variable against all exogenous variables and obtained and saved the residuals. The second step involved the regression again of equation (2) but with the addition of the residuals in the right-hand side of the

equation. As a the third step I estimated the t-statistic of the residuals and check if it is statistical significant or not. The results led to account for the endogeneity of the AvManOwn variable.

The first equation treats the measure of ownership as a dependent endogenous variable. The measure of firm performance appear to be as explanatory variable, according to the view that corporate ownership affects firm performance, which on the other hand might determine ownership structure as well.

In the first equation as control variables appear , the size of the firm proxied by (ln_assets), defined as the log of Total assets, the firm's leverage (debtoas) defined as total liabilities over total assets, the dividend policy of the firm (divp) defined as the annual dividends per share divided by earnings per share, and the net income (net_income) defined as the amount at the year end in millions of dollars.

All these variables were included in order to check for other determinants of ownership Demstesz and Villalonga (2001). In the first equation the firm size is used to test for a relationship between managerial ownership and the firm size. Leverage is used in order to predict for the possibility of debtholders affecting management (Short and Keasy 1999 and Demstesz and Villalonga 2001).

The dividend policy of the firm is used in order to capture any relation between ownership of shares with the policy of the firm. Further, and as a intuition the variable net income was added to my model in order to see if there is a relation with ownership and on the other hand performance. I based this choice not to a specific article in the literature but, in the idea that the higher the net income at the year end, this could lead to an "extra" motive to compensate for the better performance with a compensation scheme based on shares acquiring from managers of the highest tiers.

The second equation, now describes the reversed causation between firm performance and ownership structure, measured as defined earlier in this paper. In the second equation the following appears as explanatory variables. AvALLOwn is defined as the total ownership variable for the whole board of directors of the company. Again the size of the firm proxied by ln_assets, the firm's leverage (debtoas) and at the end the dividend policy of the firm (divp) defined as the annual dividends to earnings per share.

Leverage is chosen to be added in the equation in order to predict effects driven from differences between the period the firm borrowed and the specific time period of the dataset Demstev and Villalonga (2001).

I am taking under consideration these facts described in their paper and I try to incorporate them also in my model. Furthermore, I have added some variables and changed some others. For example I am using the variable *net_income* instead of the risk component in Drakos and Bekiris (2010) model. This variable was found not to have a grave influence and for that reason I took the initiative to change it with *net_income*.

To this end I have to mention that I based my model on Drakos and Bekiris (2010) one. At this point I must remind that, since I am using the approximation-Tobin's Q as determined in Chung and Pruitt (1994) and Perfect and Wiles (1994), for which only accounting information is needed in order to be calculated, I silently adopt their approach and I don't intent to search for more specific information about Tobin's Q.

As mentioned and described earlier in this chapter of my Thesis the main econometric technique that I intent to use in my research is 3SLS, but I also plan to include OLS and 2SLS regressions for purposes of comparability between the three of them.

5.5 Data and Sample

As far as it concerns now the dataset that I intent to use in this research it is between the years of 2005-2010. The data sample used for this research consists of all firms in the *S&P 500* index for the American market, with available "Financial data" from *COMPUSTAT* and "Ownership data" from *ExecuComp* for the aforementioned period. The data sample for this study does not include the years before 2005 due to lack of "Ownership data" availability for the previous years. Additionally, the initial sample included both companies from the "Financial industry" and the "Utility industry" but due to the highly regulated environment and the accounting rules which are considerably different from the other industries these two industries are to be excluded. The entire sample will be studied, but along this for reasons of comparison the index will be broken in it's representative industries for further analysis.

After the collection of my sample a set of controls were implemented and determined as follows: 1) firms must be listed in the *S&P 500* index at least 1 year prior of the

analysis, 2) Firms in the Financial and Utility Industries are to be excluded, 3) firms that their ownership changed due to mergers and acquisitions or takeover are excluded, Drakos and Bekiris (2010) and finally 4) inactive firms for the period of the analysis are also to be excluded.

The initial sample consisted from 677 companies from 8 different industries of the American market all quoted in the *S&P 500 Index*. After the implementation of all the aforementioned controls the final sample for the study consisted of 377 companies with data from the years of 2005-2010 creating a sample of 2262 year-observations.

Chapter 6

Empirical Results

In this part of my Thesis I will analyze my descriptive statistics, present the results of the regressions from my model and I will further analyze them but I will also make the projections of them with my hypotheses in order to make a more analytical presentation of them.

6.1 Descriptive Statistics

I intent to begin the first part of my empirical results with the description of the variables used in my research and especially the ones concerning ownership.

In my sample I am taking into account two different measures of ownership structure. The first one which is also one of my main endogenous variables is AvManOwn has a mean value of around 1.62% which is basically expected eve if it is rather low. The minimum value is nearly 0.5% with a maximum value of 19.27%. This last figure indicates rather low ownership percentages, which might give us the idea that with such low percentages no one can really exercise control in a corporation efficiently towards his/her interest. On the other hand we must bare in mind that this percentages represent shares with voting rights something that can alter a bit this relation.

Table 3: Descriptive Statistics, for all the variables

Descriptive Statistics					
Variable	Obs	Mean	Std. Dev.	Min	Max
AvManOwn	2262	1.62	1.50	0.49	19.27
AvALLOwn	2262	1.46	4.33	0.	42
AvROE	2262	0.24	1.29	-1.07	23.79
AvTQ	2250	1.91	0.96	0.85	7.61
ln_Assets	2262	9.44	1.41	6.28	14.63
deptoas	2262	0.60	0.20	0.07	1.58
divp	2252	216.46	1345.44	-30365.5	32715.04
net_income	2262	1310.01	4081.31	-99289	45220

The other ownership measure is AvAllOwn, with a mean value around 1.49% again relatively low but due to the fact that “ALL” represents the whole board of directors and in some cases the maximum value of 42% can be quite influential. Though again I

believe that in order to bring into alignment of interests the whole board in order to be solid as one is again rather utopic. On the other hand in general the rather low ownership percentages are in alignment with the thought that large U.S firms experience a more diffuse ownership that other firms of the same size in other markets do not. In addition now this as cumulative percentage is enough in order to provide the board with adequate power to monitor more efficiently against an inefficient management Drakos and Bekiris (2010).

Now the main measure of firm performance namely approximation-Tobin's Q has a mean value of 1.91% were the min is nearly half of it, meaning 0.85 and the max value is 7.61. Additionally the accounting rate has a relative very low mean of 0.24 and a negative value as min -1.07 something that could be due to the fact that is mainly accounting determined from net income which can be negative, and is if we look to the representative field in the table. The max value is rather high compared always with the respective one of Tobin's Q. These differences are also quite expected if someone considers that AvROE is much more sensitive to accounting artifacts and different practices. This also was one of the reasons I preferred to continue my study with Tobin's Q which even that it is the approximation that uses only accounting measures is less sensitive to artifacts that accounting rate.

The leverage variable *debt* has a mean value around 0.6 with a mean of 0.07 and a max value of 1.58, the main conclusion that can be drawn from this is that being rather low indicates that firms of this size ,large capitalization in the U.S are not so dependent on debt polices which is a rather good sign not only for their survival which is not in stake, but also for their performance.

The variable depicting the size of the firm *lnAssets* has a mean value of 9.44 with the minimum being 6.28 and the maximum 14.63 and I use it in order to check for the size of the firm. At this point I am going to elaborate on the regression results of my study.

6.2 Correlations

In Table 4 of the Appendix B, shows the correlations of the variables used in this research. The main aim is to check for multicollinearity as the problem of correlation between the independent variables can influence the quality of our results. It is shown

that none of the values between the variables is critical in a way that could cause problems to the model. To this end I will present some of them that is worth noting.

As we can see the correlations worth noting are the 0.58 between the AvManOwn and the AvAllOwn, the 0.44 between the two different measures of performance namely lnAvROE and lnAvTQ, the first based on accounting profit rates and the other on Tobin's Q. I haven't used lnAvROE in any of my regression results but I include it here in order to show its relation with Tobin's Q.

Next we must report the -0.49 among lnAssets and lnAvTQ. Additionally 0.40 is the correlation between the debtoas and lnAvTQ. Finally the last one worth mentioning is 0.43 among lnAssets and debtoas. The rest of the variables are not correlated enough in order to merit any talk.

6.3 Regression Results

Taking into account the sample used in this research, I feel the need to add some more details. To begin with, the main results reported here in table 4 is for the Final sample of 1793 companies which do not include the regulated industries of Financials and Utilities.

Furthermore in the Appendix I report all the results from the full sample and also the results per industry. More specifically I broke the S&P 500 Index into industries namely: Industrials, Health Care, Energy, Information Technology, Consumer Discretionary, Consumer Staples and Materials. Furthermore I present results for the two regulated industries of Financials-Utilities. In addition regression results are presented for the Full sample of 2262 companies without any exclusion and also for the Final one of 1793 mentioned earlier. The most important findings from this clustering will be also discussed here.

In order to determine at this point which factors influence the ownership structure-firm performance equation a regression analysis is need. Based on the literature for the specific subject most researchers take into account a model o simultaneous equations model, where in the first equation the measure of ownership is the depended variable, and in the second equation is the firm performance. Below in Table 4, we

Table 4: Regression Results excluding Financials-Utilities

Obs=1793	Panel A. Estimates					
	3SLS		2SLS		OLS	
	AvManOwn	lnAvTQ	AvManOwn	lnAvTQ	AvManOwn	lnAvTQ
C	107.31(***)(0.007)	4.17(***)(0.000)	107.31(***)(0.007)	4.17(***)(0.000)	3.17(***)(0.000)	1.90(***)(0.000)
AvManOwn		-1.20(**)(0.045)		-1.20(**)(0.046)		-0.00(0.146)
lnAvTQ	-51.37(***)(0.009)		-51.37(***)(0.009)		-0.28(**)(0.011)	
lnAssets	-6.97(***)(0.008)	-0.22(***)(0.001)	-6.97(***)(0.008)	-0.22(***)(0.001)	-0.13(***)(0.001)	-0.11(***)(0.000)
divp	0.00(**)(0.032)	0.00(0.142)	0.00(**)(0.032)	0.00(0.141)	0.00(0.59)	0.00(***)(0.000)
AvAllOwn		0.28(**)(0.049)		0.28(**)(0.049)		-0.00(0.488)
debtoas	-18.86(**)(0.012)	0.15(0.664)	-18.86(**)(0.012)	0.15(0.665)	-0.20(0.33)	-0.43(***)(0.000)
net_income	0.00(**)(0.012)		0.00(**)(0.012)		1.15(0.91)	

Panel B. Exogeneity test	
$lnAvTQ = b0 + b1 AvManOwn + b2 AvAllOwn + b3 lnAssets + b4 debtoas + b5 divp + b6 resid$	
Variable	AvManOwn
<i>t</i> -statistic	2.63 (**)

Note: Ordinary Least Squares (OLS), Two Stage least Squares (2SLS) and Three Stage Least Squares (3SLS) regressions of Average CEO ownership (AvManOwn) and Average Firm Performance (lnAvTQ) on firm size(lnAssets), dividend payout ratio (divp) Average Board Ownership (AvAllOwn), total liabilities over total Assets (debtoas) and net income (net_income) for a common sample of 377 companies for the years 2005-2010. Variable definitions are given in Table 1. P-values are given in parenthesis. (***) denotes statistical significance at 99% confidence level. (**) denotes statistical significance at 95% confidence level and (*) denotes statistical significance at 90% level. **Note:** The exogeneity test is due to Wu (1973) and Hausman (1978). T-statistic denotes the t-statistic of the coefficient of the residuals obtained from a regression of the CEO ownership variable on all exogenous variables. The null hypothesis is that OLS estimates are consistent implying that other estimators are consistent as well. Statistically significant result imply that the null hypothesis is rejected and therefore the variable in question is considered as endogenous. If we are unable to reject the null hypothesis then the corresponding null hypothesis then the corresponding variable is treated as exogenous.

can see the results of such a regression. There are several different independent variables incorporate in the model such as, leverage, the dividend policy of the firm, net income, the size of the firm all in order to catch for certain influences on the main model.

The beta coefficients show the relative influence of the independent variables in the dependent ones and the sign positive or negative the direction of the relationship. To this end I can make a projection of the results in Table 4 with my hypotheses.

The first two hypotheses was determined as follows:

H₁ : Executive ownership is a negative function of firm performance as measured by the approximation-Tobin's Q for Large American firms.

H₂ : Approximation-Tobin's Q is a negative function of executive ownership, for Large American firms.

As shown in Table 4 above this is true the coefficient of AvManOwn is -1.20 and statistical significant with the 3SLS and 2SLS methods of estimation, not statistical significant with OLS but negative in direction for all three of them. Now if we turn our attention to the second equation (we have a simultaneous equations model), again we can verify that the direction is negative and statistical significant for all three different methodologies applied. For 3SLS, 2SLS the coefficient for the equations is -51.37 and for the OLS is -0.28. In other words all the above mentioned mean that there is no relation between ownership structure components as defined here and firm performance as measured by the approximation-Tobin's Q. This result is in alignment with previous studies like Loderer and Martin (1997), Cho (1998), Demstev and Villalonga(2001) who all report that managerial ownership does not have significant role in corporate value. After this I can conclude that both H1 and H2 are accepted based on the results of Table 4.

The third hypothesis was the following:

H₃: There is a negative relation between the size of the firm (lnAssets), CEO ownership and the approximation of Tobin's Q.

As we can see in Table 4, the relation between lnAssets, both equations and all methods, is statistical significant and negative in direction. This outcome is the one I

was expecting. Additionally it is in alignment with Drakos and Bekiris (2010), and Demstez and Villalonga (2001) who argue that the larger a corporation the bigger the proportion of investment needed in the corporation. To this end hypothesis 3 is accepted .

The fourth hypothesis made for the realization of my Thesis was :

H₄ : A negative relation exists between the dividend policy of the firm (divp), CEO ownership and Tobin's Q.

I was expecting the relation between the dividend policy, ownership structure and performance to be negative but my results indicate otherwise with a positive and statistical significant relationship appearing. More specifically for the ownership equation and for the 3SLS, and 2SLS methodologies is significant. For the same equation OLS do no report statistical significance. The coefficients for the former are 0.00 positive and significant at 5% level of tolerance, and for the latter is 0.00 but insignificant. On the other hand for the firm performance equation, the reported results are positive but insignificant for 3SLS and 2SLS methods, with coefficients again 0.00, but the OLS report both positive and statistical significant results 0.00 in 1% level of tolerance. I must add here that my results are not in alignment with the ones of Jensen et al. (1992), Fenn and Liang (2001) and Drakos and Bekiris (2010) who find dividends to be negatively related with ownership. This leads me to conclude that the results for H₄ are rejected because the direction of the relationship does not prove to be the hypothesized one nore proving to be a systematic one for both equations in my model.

H₅ : A negative relation exists between leverage (debtoas), CEO ownership and Tobin's Q approximation.

I expected to have negative relation between leverage ownership and firm performance, and the empirical results from my sample does support something like this. As seen in Table 4 more specifically for the ownership equation the relation that appears between leverage and ownership, is negative and statistical significant with both 3SLS and 2SLS, at 5% level of confidence with coefficients -18.86 . On the other hand when we turn our attention to the firm performance equation the interrelation of leverage and Tobin's Q appear to be positive but insignificant for

3SLS and 2SLS, and negative and significant for OLS estimates with a coefficient value of -0.43 in 1% confidence level. In addition my results are in alignment with the ones of Demstev and Villalonga (2001) and Drakos and Bekiris (2010). All this lead me to the conclusion that hypothesis 5 is accepted, on the other hand someone could argue that it fails to establish a systematic relation between the examined variables .

Finally when examining the sixth and final hypothesis:

H₆ : Net income (net_income)is positively related with CEO ownership.

If we examine Table 4 we can clearly see that the relation between net income and ownership is positive and strongly significant in 5% level of confidence, for 3SLS and 2SLS estimations, but insignificant for OLS. The coefficient value is 0.00 for the former and 1.15 for the latter. I used this variable without any strong evidence or hint from previous empirical results in the literature on this exact relation but basically driven from an intuition, that through compensation schemes could be related with higher managerial and especially CEO ownership. At this point though I would like to mention that for closely-held companies CEO compensation (and thus ownership) is less based on accounting measures Ke et al. (1999) and since the companies in my sample are not closely-held, I can assume that accounting measures are active and this is the reason why I found positive the relation between net income and CEO ownership. For this reason I can conclude that hypothesis 6 is accepted.

At this point in order to summarize my results along with my hypotheses, I conclude that the first three hypotheses are supported and accepted the forth is rejected, and the fifth along with the sixth are again supported and accepted.

Furthermore, now concerning the clustering of the initial sample, all results can be found in Appendix B. Here I will conduct a small elaboration for the main variables only.

The first Industry is **Industrials** with 312 observations where all coefficients reported were negative, for the main variables on all different methods.

The second one that appeared in the sample is **Health Care** with 245 observations were for the first equation of ownership the coefficient reported is again negative and insignificant as well.

The **Energy** Industry with 156 observations. For the first equation which is the ownership one the coefficient is positive but insignificant for all three methods of estimations. The second equations now which is the firm performance one, the coefficient of AvManOwn is positive but insignificant and for AvAllOwn is negative and again insignificant.

The fourth cluster I created was the **Information Technology** Industry with 383 observations where, in the first equation of ownership the OLS estimates reported are positive and insignificant, but in the other hand the coefficient of 2SLS and 3SLS are negative and significant. 2SLS is reported with a coefficient of -6.71 significant in 5% tolerance level and the 3SLS with again -6.71 in 5% tolerance level.

Furthermore, while the fifth industry group was **Consumer Discretionary**, with 341 observations. The first equation reports negative results and insignificant, while the second equation of performance for the AvManOwn variable reports negative and not significant results with all methods of estimation, while on the other hand AvAllOwn reports again insignificant results for all methods but with the OLS estimation the coefficient is found to be negative, with 2SLS and 3SLS positive as far as it concerns its relation with performance.

The most interesting results appear to be found with the sixth cluster which was the industry of **Consumer Staples** having though a relatively low amount of observations equaling 198. The first equation of ownership is found to be negative (in alignment with the hypotheses H1, H2) and significant for all methods of estimations. More specifically OLS, 2SLS and 3SLS, respectively had coefficients -2.76, -0.25, -0.25 all strongly significant in 1% confidence level. The second equation now, and AvManOwn was negative and significant for all estimation methods. OLS reported -0.02 in 5% confidence level, while both 2SLS and 3SLS were negative and strongly significant in 1% level of tolerance with coefficients -0.25 for both methods. The other ownership variable in the performance equation denoted here as AvAllOwn was negative and insignificant with OLS, but positive and strongly significant with

the other two estimation methods. The value of the coefficient were 0.05 for both 2SLS and 3SLS.

The Industry of **Materials** had the less observations of all equaling 162. All results were insignificant with all methods, but for the first equation the coefficient had a positive value and as well in the second one AvManOwn is reported again with positive beta. The AvALLOwn on the other side is reported with a negative coefficient.

Finally before I close with the empirical result Chapter I made a extra analysis for the two regulated industries and their interrelation with the whole sample. As a result one more cluster is made representing both the **Financial-Utilities** sectors. In addition to this I regressed again the model without the exclusion of these two industries in order to capture the effect -if any- on the whole sample denoted here **Full Sample**.

The results were the following: for the **Financials-Utilities** in the first equation the main variable is negative and insignificant with the OLS estimates but positive and significant for 2SLS and 3SLS. The respective coefficients are 8.64 for both methods in 1% confidence level. On the other hand now, and for the second equation AvManOwn is found to be negative and significant for OLS and the value of the coefficient is -0.07 in 5% level of significance, but was found to be again negative and insignificant for the 2SLS and 3SLS methods. The AvALLOwn variable of the second equation was positive with 0.02 coefficient in 1% level of significance with OLS estimates. Both the other two methods produce insignificant but positive coefficients.

If we turn now our attention in the last **Full Sample**, it was the largest with 2262 observations, including the two regulated Industries. The results produced are similar with the 1793 sample presented in Table 3. The most important is that the direction of the interrelations between the variables do not change dramatically but the significance level drops adequate enough for someone to claim the sample should exclude these industries.. In my personal opinion this casts some doubts on how dramatic the changes can be in the results, but in general we must always take under consideration the samples with whom the research is done along with the definitions of each researcher.

Chapter 7

Conclusion, Limitations, Further Research

In this final Chapter of my Thesis I will draw my final conclusion, analyze any limitations occurred in my research and I will also try to make key suggestions for further research on the subject. At this point I would like to present a summarizing table of my results compared to the literature.

Table 5: Summary Table of my results compared to the literature.

Hypothesis Number	Hypotheses	Result	Reference in Literature	Result Compared to Literature
H1	Executive ownership is a negative function of firm performance as measured by the approximation-Tobin's Q.	Accepted	Loderer and Martin (1997), Cho (1998), Demstez and Villalonga (2001)	In alignment with Literature
H2	Approximation-Tobin's Q is a negative function of executive ownership.	Accepted	Loderer and Martin (1997), Cho (1998), Demstez and Villalonga (2001)	In alignment with Literature
H3	There is a negative relation between the size of the firm (lnAssets), CEO ownership and the approximation of Tobin's Q.	Accepted	Demstez and Villalonga (2001), Drakos and Bekiris (2010)	In alignment with Literature
H4	A negative relation exists between the dividend policy of the firm (divp), CEO ownership and Tobin's Q.	Rejected	Drakos and Bekiris (2010), Fenn and Liang (2001), Jensen et al. (1992)	Not in Alignment with Literature
H5	A negative relation exists between leverage (debttoas), CEO ownership and Tobin's Q approximation.	Accepted	Demstez and Villalonga (2001), Drakos and Bekiris (2010)	In alignment with Literature
H6	Net income (net_income) is positively related with CEO ownership.	Accepted	New approach	New approach

7.1 Conclusion

This paper concerns a research Master Thesis for a study about Corporate Ownership structure and especially managerial ownership and its relation with firm performance for a sample of U.S firms quoted in S&P 500 index, taking into account the issue of endogeneity between the variables chosen. Additionally the regression analysis helped determine which other factors are influential to the performance-ownership relationship.

A lot of different empirical studies so far have provided evidence that such a relationship exists. The main question was if it exists also for managerial ownership (top executives-insiders) of the firms quoted in the S&P 500 index of the U.S economy.

Most of the evidence for an existence or not of such a relationship until now covers the US and the UK markets. This is also one of the main reasons why I decided to investigate this topic. The information already existing along with the vast literature on these markets can be a great tool when investigating a specific subject.

During this study and before commenting about the results I would like to mention that I took into account the problem of endogeneity and in order to solve it I employed a simultaneously equations model accompanied with a highly balanced panel data sample.

After taking into account all the above mentioned I can conclude that the results of this study suggest that there is a negatively and systematically observed relation between ownership structure components as measured here and the firm performance when measured by Tobin's Q. More specifically in this case, a negative relation appears between insider ownership with Tobin's Q for a sample of Large U.S firms quoted in the S&P 500 index. Furthermore these findings are consistent with the plethora of studies done in different Markets. To this end also I would like to add that through the regression analysis I also found that leverage (deptoassets), and the size of the firm(ln_assets) are also negatively related with ownership structure as measured by CEO ownership and firm performance as measured by the approximation of Tobin's Q. On the other hand the dividend policy of the firm is found to be influential with a positive relation with positive relation with ownership

and performance. Finally net income is also found to be positively related with CEO ownership.

Although here I must denote that the Market into which the study takes place is very important on the outcome. Empirical studies from other markets report that a positive relation between ownership and performance of firms exists. Recently Kapopoulou and Lazaretou (2007), and Drakos and Bekiris (2010) found evidence of such a relationship for the Greek Market and especially for companies quoted in the Athens Stock Exchange.

This leads me to another conclusion, that Market specificity plays a serious role in this relationship along with a lot more. The more regulated Markets of U.S and U.K do not support this notion. Finally due to the complications that arise from such complex corporate governance subjects and due to the fact that there is no unifying method or model to study these relationships the generalization of the results of such a study must be done with great attention.

7.2 Limitations

Like all studies when investigating a specific subject some limitations are supposed to rise.

One of the most important is the one of data availability. In my opinion most of the researchers encounter such problems to one or another extent during their studies. In this case and for this specific subject it would be desirable to have more data concerning first other components of ownership such as blockholders , institutional investors even family ownership, and secondly for other markets and especially emerging ones. This could be helpful in order for someone to be able to carry out a more thorough research, taking also into account differences among markets. For a example a less regulated economy than the U.S could produce totally different results.

Another limitation of this study could be that for the second equation where Tobin's Q is the dependent variable, I mainly used accounting and market variables in order to capture variations of it, which are not so sensitive to specific determinants of Tobin's Q. Especially for Tobin's Q ratio there are a lot of ways that a researcher could define it from simple one's to some very sophisticated, Lindberg and Ross (1981), Perfect and Wiles (1994). I am not in the position to predict any differences to the results, but

this could be the case why not all selected explanatory variables of performance are found with low significance compared to the first equation of ownership.

Finally in my opinion the lack of specific theoretical framework concerning the design of the econometric model in order to study the relationship that arises between ownership and performance could always mislead even the most experience researcher.

In addition to this, my lack of solid econometric theory could cast some doubt on the specification of my model and consequently on results produced for this study. In order though to reduce this to a minimum I based my model to the models of Demstev and Villalonga (2001) and also to the one of Drakos and Bekiris (2010).

To this end I would like to mention what Barnhart and Rosenstein (1998) report in their paper “For correctly specified models, the choice of instruments involves substantial tradeoffs between bias and efficiency (Phillips, 1980)”.

7.3 Further Research

Again here I will denote that the subject of corporate ownership structure and firm performance is a field of fruitful research and grave difficulties. There are so many different aspects in modern corporations that interrelate with one another that a researcher could find the process of decision making for the proper variables a quite difficult procedure. In this section here I would like to make some suggestions.

To begin with a very important aspect to encounter to in future analyses is the age of firms, because some specific CEO characteristics along with firm characteristics may vary between corporations with different ages. It is easy to understand that a new corporation in an old market and vice versa have different determinants of performance and ownership concentration. So for future research an age constructed variable could shed some more light on “the well hidden” characteristics of this relationship.

In addition, after the realization of my Thesis the most extraordinary finding was that a specific industry arise with results worth noting. This industry was Consumer Staples. The fact that positive and significant results reported, and despite the fact that the sample was rather small and it can be biased, something else caught my attention.

That was the Industry specificity of Consumer Staples. Consumer Staples is a sector of the U.S economy that includes companies who are part of the consumers “needed” monthly purchases. This specific fact, means that the economic cycles of their products are very short.

This industry characteristic, might be a determinant for better performance, which could have led in higher compensation plans for management of all tiers. So, this could be the link for more share ownership. Demstev and Lehn (1985) argue that a specific ownership concentration in a corporation might be interpreted as the firm’s optimal response to it’s operating environment. To conclude with, the sector and industry characteristics should be encounter for, from future researchers when investigating the relationship between ownership and performance.

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Appendix A:

Table 6 : Pearson Correlation Matrix, for the main variables in the sample studied.

Pearson Correlation Matrix								
	AvManOwn	AvALLOwn	lnAvTQ	lnAvROE	lnAssets	debtoas	divp	net_income
AvManOwn	1							
AvALLOwn	0.58	1						
lnAvTQ	0.01	-0.01	1					
lnAvROE	-0.10	-0.18	0.44	1				
lnAssets	-0.09	-0.00	-0.49	-0.18	1			
debtoas	-0.06	-0.19	-0.40	0.06	0.43	1		
divp	-0.01	0.06	-0.00	0.02	0.19	0.01	1	
net_income	-0.03	0.09	0.04	0.07	0.36	-0.01	0.23	1

Appendix B:

Regression Results for the Final sample, per Industry and for the two regulated Industries of Financials-Utilities.

Final Sample						
Obs= 1793	OLS		2SLS		3SLS	
	Coef.	P	Coef.	P	Coef.	P
AvManOwn						
lnAvTQ	-0.28	0.011	-51.37	0.009	-51.37	0.008
lnAssets	-0.13	0.001	-6.97	0.008	-6.97	0.008
debtoas	-0.20	0.339	-18.86	0.012	-18.86	0.012
divp	0.00	0.594	0.00	0.032	0.00	0.032
net_income	1.15	0.913	0.00	0.012	0.00	0.012
_cons	3.17	0.000	107.31	0.007	107.31	0.007
lnAvTQ						
AvManOwn	-0.00	0.146	-1.20	0.046	-1.20	0.045
AvAllOwn	-0.00	0.488	0.28	0.049	0.28	0.049
ln_Assets	-0.11	0.000	-0.22	0.001	-0.22	0.001
debtoas	-0.43	0.000	0.15	0.665	0.15	0.664
divp	0.00	0.000	0.00	0.142	0.00	0.141
_cons	1.90	0.000	4.17	0.000	4.17	0.000

Industrials						
Obs=312	OLS		2SLS		3SLS	
	Coef.	P	Coef.	P	Coef.	P
AvManOwn						
lnAvTQ	-0.05	0.241	-77.08	0.944	-77.08	0.943
lnAssets	-0.12	0.000	-20.82	0.943	-20.82	0.943
debtoas	0.09	0.210	-14.52	0.944	-14.52	0.944
divp	0.00	0.273	-0.00	0.944	-0.00	0.944
net_income	0.00	0.333	0.00	0.944	0.00	0.943
_cons	2.48	0.000	244.6	0.943	244.66	0.943
lnAvTQ						
AvManOwn	-0.07	0.327	10.81	0.509	10.81	0.505
AvAllOwn	0.00	0.742	-0.54	0.510	-0.54	0.506
ln_Assets	-0.20	0.000	0.79	0.600	0.79	0.596
debtoas	-0.23	0.016	-2.01	0.469	-2.01	0.464
divp	0.00	0.000	-0.00	0.617	-0.00	0.613
_cons	2.80	0.000	-19.70	0.561	-19.70	0.557

Health Care						
obs=245	OLS		2SLS		3SLS	
	Coef.	P	Coef.	P	Coef.	P
AvManOwn						
lnAvTQ	-0.10	0.480	-21.24	0.142	-21.24	0.137
lnAssets	-0.40	0.000	-4.06	0.112	-4.06	0.107
debtoas	-0.10	0.697	-10.58	0.163	-10.58	0.157
divp	0.00	0.773	-0.00	0.349	-0.00	0.343
net_income	0.00	0.076	0.00	0.148	0.00	0.143
_cons	5.27	0.000	58.00	0.110	58.00	0.105
lnAvTQ						
AvManOwn	0.09	0.168	23.45	0.850	23.45	0.848
AvAllOwn	-0.05	0.098	-11.11	0.850	-11.11	0.848
ln_Assets	-0.11	0.000	1.09	0.866	1.09	0.864
debtoas	-0.62	0.000	2.65	0.880	2.65	0.879
divp	0.00	0.233	-0.00	0.855	-0.00	0.853
_cons	2.03	0.000	-37.74	0.858	-37.74	0.856

Energy						
obs=156	OLS		2SLS		3SLS	
	Coef.	P	Coef.	P	Coef.	P
AvManOwn						
lnAvTQ	0.14	0.103	11.02	0.308	11.02	0.297
lnAssets	-0.00	0.923	1.59	0.318	1.59	0.308
debtoas	-0.51	0.002	3.19	0.431	3.19	0.421
divp	-0.00	0.169	-0.00	0.320	-0.00	0.310
net_income	1.52	0.712	-0.00	0.362	-0.00	0.352
_cons	1.55	0.000	-20.60	0.351	-20.60	0.341
lnAvTQ						
AvManOwn	0.22	0.138	19.31	0.828	19.31	0.825
AvAllOwn	-0.03	0.489	-5.14	0.829	-5.14	0.826
ln_Assets	-0.13	0.000	-0.85	0.799	-0.85	0.795
debtoas	-0.31	0.049	1.73	0.858	1.73	0.856
divp	0.00	0.000	0.00	0.668	0.00	0.661
_cons	1.64	0.000	-15.18	0.847	-15.18	0.843

Information Technology						
obs=383	OLS		2SLS		3SLS	
	Coef.	P	Coef.	P	Coef.	P
AvManOwn						
lnAvTQ	0.06	0.582	-6.71	0.015	-6.71	0.014
lnAssets	-0.12	0.005	-1.01	0.008	-1.01	0.008
debtoas	0.03	0.887	-3.54	0.027	-3.54	0.025
divp	0.00	0.407	0.00	0.651	0.00	0.648
net_income	0.00	0.086	0.00	0.012	0.00	0.011
_cons	2.58	0.000	16.66	0.004	16.66	0.004
lnAvTQ						
AvManOwn	0.05	0.024	2.08	0.086	2.08	0.084
AvAllOwn	-0.01	0.005	-0.23	0.075	-0.23	0.072
ln_Assets	-0.06	0.000	0.06	0.544	0.06	0.540
debtoas	-0.66	0.000	-0.93	0.032	-0.93	0.030
divp	0.00	0.058	-0.00	0.687	-0.00	0.685
_cons	1.54	0.000	-2.39	0.326	-2.39	0.321

Consumer Discretionary						
obs=341	OLS		2SLS		3SLS	
	Coef.	P	Coef.	P	Coef.	P
AvManOwn						
lnAvTQ	-0.56	0.165	-72.72	0.141	-72.72	0.137
lnAssets	0.20	0.216	-12.02	0.157	-12.02	0.153
debtoas	-1.97	0.020	-20.78	0.174	-20.78	0.170
divp	-0.00	0.783	0.02	0.209	0.02	0.204
net_income	0.00	0.526	0.00	0.805	0.00	0.803
_cons	2.07	0.164	166.25	0.141	166.25	0.137
lnAvTQ						
AvManOwn	-0.00	0.707	-0.75	0.944	-0.75	0.944
AvAllOwn	-0.00	0.540	0.24	0.945	0.24	0.945
ln_Assets	-.016	0.000	-0.23	0.817	-0.23	0.816
debtoas	-0.30	0.012	1.15	0.956	1.15	0.956
divp	0.00	0.010	0.00	0.929	0.00	0.928
_cons	2.28	0.000	2.76	0.688	2.76	0.686

Consumer Staples						
Obs=198	OLS		2SLS		3SLS	
	Coef.	P	Coef.	P	Coef.	P
AvManOwn						
lnAvTQ	-2.76	0.000	-16.49	0.000	-16.49	0.000
lnAssets	-1.18	0.004	-4.71	0.000	-4.71	0.000
debtoas	1.30	0.370	11.03	0.001	11.03	0.000
divp	0.00	0.965	0.00	0.250	0.00	0.242
net_income	0.00	0.056	0.00	0.000	0.00	0.000
_cons	13.69	0.001	47.15	0.000	47.15	0.000
lnAvTQ						
AvManOwn	-0.02	0.011	-0.25	0.000	-0.25	0.000
AvAllOwn	-0.00	0.886	0.05	0.000	0.05	0.000
ln_Assets	-0.06	0.044	-0.31	0.000	-0.31	0.000
debtoas	0.58	0.000	0.38	0.201	0.38	0.193
divp	0.00	0.000	0.00	0.087	0.00	0.081
_cons	0.89	0.014	3.71	0.000	3.71	0.000

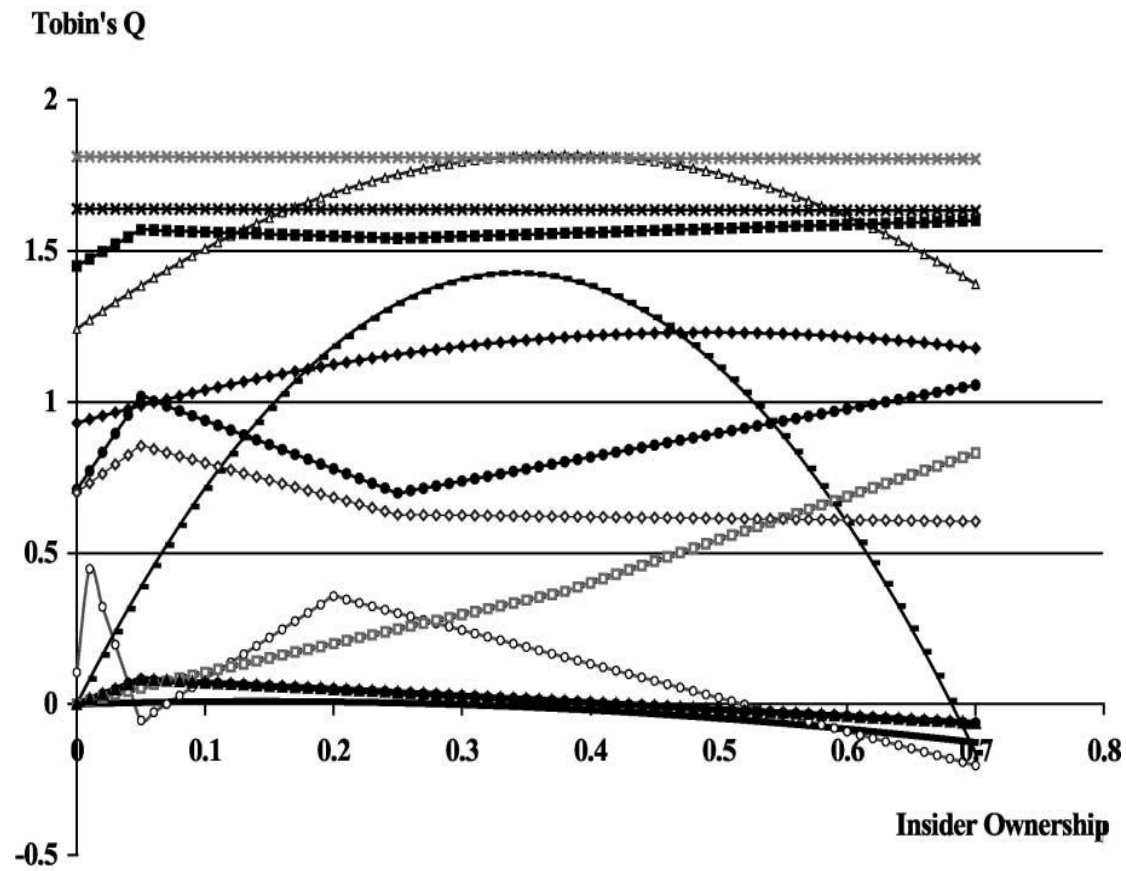
Materials						
Obs=162	OLS		2SLS		3SLS	
	Coef.	P	Coef.	P	Coef.	P
AvManOwn						
lnAvTQ	0.06	0.335	19.89	0.836	19.89	0.833
lnAssets	-0.05	0.011	1.34	0.844	1.34	0.841
debtoas	0.02	0.869	14.45	0.837	14.45	0.833
divp	-0.00	0.519	0.00	0.852	0.00	0.849
net_income	1.07	0.941	-0.00	0.842	-0.00	0.839
_cons	1.70	0.000	-28.73	0.846	-28.73	0.843
lnAvTQ						
AvManOwn	0.10	0.326	3.51	0.762	3.51	0.757
AvAllOwn	-0.01	0.811	-0.79	0.765	-0.79	0.761
ln_Assets	-0.05	0.027	0.06	0.881	0.06	0.879
debtoas	-0.75	0.000	-0.68	0.184	-0.68	0.175
divp	-0.00	0.583	-0.00	0.752	-0.00	0.748
_cons	1.32	0.000	-3.89	0.827	-3.89	0.823

Financials-Utilities						
Obs=448	OLS		2SLS		3SLS	
	Coef.	P	Coef.	P	Coef.	P
AvManOwn						
lnAvTQ	-0.02	0.807	8.64	0.007	8.64	0.006
lnAssets	-0.00	0.913	1.31	0.008	1.31	0.008
debtoas	-0.27	0.083	-1.27	0.128	-1.27	0.125
divp	-1.88	0.874	-0.00	0.760	-0.00	0.758
net_income	-1.38	0.877	-0.00	0.018	-0.00	0.017
_cons	1.64	0.000	-13.02	0.018	-13.02	0.017
lnAvTQ						
AvManOwn	-0.07	0.016	-16.31	0.845	-16.31	0.844
AvAllOwn	0.02	0.000	2.19	0.844	2.19	0.843
ln_Assets	-0.12	0.000	-0.38	0.774	-0.38	0.772
debtoas	0.17	0.059	6.39	0.842	6.39	0.841
divp	5.65	0.369	0.00	0.870	0.00	0.869
_cons	1.53	0.000	20.64	0.833	20.64	0.832

Full Sample						
Obs= 2241	OLS		2SLS		3SLS	
	Coef.	P	Coef.	P	Coef.	P
AvManOwn						
lnAvTQ	-0.20	0.026	-71.01	0.053	-71.01	0.053
lnAssets	-0.11	0.000	-10.68	0.052	-10.68	0.052
debtoas	-0.26	0.129	-27.32	0.056	-27.32	0.056
divp	7.19	0.770	0.00	0.105	0.00	0.104
net_income	2.12	0.812	0.00	0.057	0.00	0.057
_cons	2.96	0.000	155.75	0.049	155.75	0.049
lnAvTQ						
AvManOwn	-0.01	0.097	-1.72	0.053	-1.72	0.053
AvAllOwn	-3.13	0.999	0.39	0.055	0.39	0.054
ln_Assets	-0.12	0.000	-0.25	0.001	-0.25	0.001
debtoas	-0.46	0.000	0.42	0.407	0.42	0.406
divp	0.00	0.000	0.00	0.306	0.00	0.305
_cons	2.01	0.000	4.94	0.001	4.94	0.001

Appendix C:

Results of empirical studies of the relation between Tobin's Q and insider ownership.
Demsetz and Villalonga (2001)



Appendix D :

Statistical Approach.

1. Simultaneous Equations model.

The classical linear regression model, general linear regression model, and seemingly unrelated regressions model make the following assumption:

That the error term is uncorrelated with each explanatory variable.

If an explanatory variable is uncorrelated with the error term it is called an exogenous variable. If an explanatory variable is correlated with the error term it is called an endogenous variable.

There are 3 main cases in which sources produce a correlation between the error term and an explanatory variable. These are the following:

- 1) Omission of an important explanatory variable.
- 2) Measurement error in an explanatory variable.
- 3) Reverse causation.

In our case as reported earlier in the literature review, we will focus on reverse causation. Reverse causation occurs when a change in a right-hand side variable causes a change in the left-hand side variable, and a change in the left-hand side variable causes a change in the right-hand side variable.

In the case of the ownership-performance relation we expect that ownership determines performance, and on the other hand this also happens for performance.

With the model of simultaneous equations elaborated in the following section of this chapter I intend to estimate the ownership-performance relation.

When a single equation is embedded in a system of simultaneous equations, at least one of the right-hand side variables will be endogenous, and therefore the error term will be correlated with at least one of the right-hand side variables. In this case, the system of equations is described by a simultaneous equations regression model. In case someone uses the OLS estimator only, will get biased and inconsistent estimates of the population parameters. This is the main reason why I incorporate in my analysis also 2SLS and 3SLS estimates.

Definitions and Basic Concepts

Endogenous variable – a variable whose value is determined within an equation system. The values of the endogenous variables are the solution of the equation system. The variable $\ln AvTQ$ along with $AvManOwn$ are the endogenous variables of the system of equations.

Exogenous variable – a variable whose value is determined outside an equation system. Here we must add that in an equation system the exogenous variable has no correlation with the error term. All the rest of the variables appearing in the model of simultaneous are considered to be endogenous.

Structural equation – an equation that has one or more endogenous right-hand side variables.

Reduced form equation – an equation for which all right-hand side variables are exogenous.

Specifying a Simultaneous Equation System

A simultaneous equation system is one of 4 important types of equation systems that are used to specify statistical models in economics. The others are the seemingly unrelated equations system, recursive equations system, and block recursive equation system.

The Identification Problem

Before a researcher tries to estimate a structural equation that is part of a simultaneous equation system, he/she must first determine whether the equation is identified. If the equation is not identified, then estimating its parameters is meaningless. This is because the estimates you obtain will have no interpretation, and therefore will not provide any useful information.

Classifying Structural Equations

Classifying a structural equation is really important in the procedure before estimating a simultaneous equations model. Every structural equation can be placed in one of the following three categories.

1. Unidentified equation – The parameters of an unidentified equation have no interpretation, because you do not have enough information to obtain meaningful estimates.
2. Exactly identified equation – The parameters of an exactly identified equation have an interpretation, because you have just enough information to obtain meaningful estimates.

3. Overidentified equation – The parameters of an overidentified equation have an interpretation, because you have more than enough information to obtain meaningful estimates.

Rank and Order Condition for Identification

Exclusion restrictions – the procedure during the researcher excludes variables from the model- are most often used to identify a structural equation in a simultaneous equations model. When using exclusion restrictions, you can use two general rules of thumb to check if identification is achieved. These are the rank condition and the order condition. The order condition is a necessary but not sufficient condition for identification. The rank condition is both a necessary and sufficient condition for identification. Because the rank condition is more difficult to apply, many economists only check the order condition and gamble that the rank condition is satisfied. This is usually, but not always the case. Based on the above mentioned I will do the same for my model.

Analyzing Order Condition

The order condition is a simple counting rule that can be used to determine if one structural equation in a system of linear simultaneous equations is identified. So in order to meet the order conditions someone must define the following:

G = total number of endogenous variables in the model (i.e., in all equations that comprise the model).

K = total number of variables (endogenous and exogenous) excluded in the equation being checked for identification.

The order condition is as follows.

If $K = G - 1$ the equation is exactly identified

If $K > G - 1$ the equation is over identified

If $K < G - 1$ the equation is unidentified

Specification

A simultaneous equation regression model has two alternative specifications:

- i. Reduced form
- ii. Structural form

The reduced-form specification is comprised of M reduced-form equations and a set of assumptions about the error terms in the reduced form equations. The reduced-form specification of the model is usually not estimated, because it provides limited information about the economic process in which a researcher might be interested. The structural-form specification is comprised of M structural equations and a set of assumptions about the error terms in the structural equations. The structural-form specification of the model is the specification most often estimated. This is because it provides more information about the economic process in which the researcher is interested.

Specification of the Structural Form of the Model

A set of assumptions defines the specification of the structural form of a simultaneous equations regression model. The key assumption is that the error term is correlated with one or more explanatory variables.

There are several alternative specifications of the structural form of the model depending on the remaining assumptions we make about the error term. For example, if we assume that the error term has non-constant variance, then we have a simultaneous equation regression model with heteroscedasticity.

If we assume the errors in one or more equations are correlated, then we have a simultaneous equation regression model with autocorrelation. We will assume that the error term has constant variance, and the errors are not correlated within the two equations.

2. Estimation and procedures

Single Equation Vs System Estimation

Two alternative approaches can be used to estimate a simultaneous equation regression model. Both of whom have different

1. Single equation estimation
2. System estimation

Single Equation Estimation

Single equation estimation involves estimating either one equation in the model, or two or more equations in the model separately. In my Thesis, I have a simultaneous equation regression model that consists of two equations: the ownership equation and the firm performance equation. Supposing my objective is to obtain an estimate of the coefficient of performance. In this case, I might estimate the performance equation only.

System Equation Estimation

System estimation involves estimating two or more equations in the model jointly. For instance, in my model above I might need to estimate the ownership and firm performance equations together.

Advantages and Disadvantages of the Two Approaches

The major advantage of system estimation is that it uses more information, and therefore results, in more precise parameter estimates. The major disadvantages are that it requires more data and is sensitive to model specification errors. The opposite is true for single equation estimation.

3. Single Equation Estimators

In this chapter I will analyze two of the three single equation estimators.

1. Ordinary least squares (OLS) estimator
2. Two-stage least squares (2SLS) estimator

Each of these estimators is biased in small samples. Therefore, if the sample data are generated by a simultaneous equation regression model you cannot find an estimator that has desirable small sample properties. This means that you must look for an estimator that has desirable asymptotic properties.

Ordinary Least Squares (OLS) estimator

Properties of the OLS Estimator

If the sample data are generated by a simultaneous equation regression model, then the OLS estimator is biased in small samples, and inconsistent in large samples. It

does not produce maximum likelihood estimates. Thus, it has undesirable small and large sample properties.

Role of OLS Estimator

Within the context of simultaneous equations models the OLS estimator should be used as a preliminary estimator. The equation should be estimated initially using the OLS estimator, and afterwards the estimation should be done using a consistent estimator. At the end from the comparison of the two estimates the direction of the bias could be determined.

Two-Stage Least Squares (2SLS) Estimator

The 2SLS estimator is a special type of IV estimator. It involves two successive applications of the OLS estimator, and is given by the following two stage procedure.

1. After the regression of each right-hand side endogenous variable in the equation to be estimated on all exogenous variables in the simultaneous equation model using the OLS estimator. Calculate the fitted values for each of these endogenous variables.
2. In the equation to be estimated, replace each endogenous right-hand side variable by its fitted value variable. Estimate the equation using the OLS estimator.

Stage 1 is identical to estimating the reduced-form equation for each endogenous right-hand side variable in the equation to be estimated. The estimated standard errors obtained from the stage 2 regression are incorrect and must be corrected. The 2SLS estimator is the most popular single equation estimator, and one of the most often used estimators in economics.

Properties of the 2SLS Estimator

If the error term is correlated with one or more explanatory variables, then the 2SLS estimator is biased in small samples. However it is consistent and in the class of single equation estimators asymptotically efficient. Thus, it has desirable large sample properties.

Until so far all these general information concerning OLS and 2SLS are provided in order for the rest to be more easily understood. Taking all these into account while employing a simultaneous equations context for the ownership-performance model can help us not to make any specification errors and at the same time help us realize and better understand the differences between the three different methods while commenting on the results obtained from the regressions later on, the next chapter.

4. System Estimators

Now except from the single estimators I intent to provide some information about one system estimator namely 3SLS. The system estimators can be used to estimate two or more identified equations in a simultaneous equation model together. Thus, a system estimator uses more information than a single equation estimator (e.g., correlation among the error terms across equations), and therefore will produce more precise estimates.

Three-Stage Least Squares (3SLS) Estimator

The 3SLS estimator involves the following 3 stage procedure.

1. Same as 2SLS.
2. Same as 2SLS.
3. Apply the SUR estimator.

Properties of the 3SLS Estimator

If the error term is correlated with one or more explanatory variables, then the 3SLS estimator is biased in small samples. However it is consistent and asymptotically more efficient than single equation estimators. Thus, it has desirable large sample properties.

To this end I need to specify that the background information I provided here concerning these 3 different estimators was due to the fact that I use these specific ones in my analysis in the progress of my Thesis. Additionally to these some more of the same importance exist namely for single ones ,IV estimator (instrumental variable) and for system ones the iterated 3SLS estimator(I3SLS).

5. Specification Testing

One of the most important specification tests that can be conducted for simultaneous equations regression models is a formal Test of Exogeneity and more specifically the one developed by Haussman (1976). The implementation of this test will be conducted by using a single equation estimation procedure.

Test of Exogeneity

If you believe one or more right-hand side variables appearing in an equation may or may not be exogenous, then you can perform a formal test of exogeneity.

In order to perform an exogeneity test the following methodology can be applied.

Difine the equation to be estimated and the identifying instruments as

$$Y = a + \mathbf{b}Y_1 + \mathbf{c}X + \mu$$

Z = identifying instruments

Where Y is the dependent (left-hand side) variable; Y_1 is a vector of one or more right-hand side variables that you believe may or may not be endogenous; X is a vector of right-hand side variables you believe are exogenous; a is the intercept; \mathbf{b} and \mathbf{c} are vectors of slope coefficients attached to the variables in Y_1 and X , respectively; and Z is a vector of exogenous variables that are excluded from this equation, and therefore used as identifying instruments for the endogenous variable(s) in Y_1 ; and μ is the error term.

Hausman Test

The most often used test of exogeneity is the Hausman test. The Hausman test is based on the following methodology. Assume Y_1 to be interpreted more generally as a vector that contains one or more variables that are believed may be correlated with the error term μ . The null and alternative hypotheses are as follows:

H_0 : Y_1 and μ are not correlated

H_1 : Y_1 and μ are correlated

To test the null hypothesis that Y_1 and μ are not correlated, you proceed as follows.

1. Compare two estimators. One estimator should be a consistent estimator if the null hypothesis is true but an inconsistent estimator if the null hypothesis is false (e.g., OLS estimator). The second estimator should be a consistent estimator regardless of whether the null hypothesis is true or false (e.g., 2SLS estimator).
2. If the null hypothesis is true, then both estimators should produce similar estimates of the parameters of the equation. If the null hypothesis is false, then the two estimators should produce significantly different estimates of the parameters of the equation. Thus, to test the null hypothesis you test the equality of the estimates produced by the two estimators.
3. If the parameter estimates produced by the two estimators are significantly different, then the researcher shall reject the null hypothesis and conclude that the sample provides evidence that Y_1 is correlated with μ in the population. If the parameter estimates produced by the two estimators are not significantly different, then you accept the null hypothesis and conclude that Y_1 is not correlated with μ in the population.

In the case of testing whether the variable(s) in Y_1 are endogenous, then one should interpret the null and alternative hypotheses as follows.

$H_0: Y_1$ is exogenous (Y_1 and μ are not correlated)

$H_1: Y_1$ is endogenous (Y_1 and μ are correlated)

Interpretation of Hausman Test

With the rejection of the null hypothesis, this implies that there is evidence that Y_1 is correlated with μ . You interpret this as evidence that Y_1 is endogenous. However, there are other reasons why Y_1 might be correlated with μ (e.g., Y_1 is measured with error). Thus, a certain conclusion of what causes the correlation between X and μ cannot be determined. However, the interpretation is that you have found evidence that Y_1 is endogenous.

Implementing the Hausman test involves the following steps with respect to the variables that need to be checked.

1. Regress each variable in Y_1 on all variables in X and Z (all exogenous variables in the model) using the OLS estimator.
2. Save the residuals from each of these regressions. Denote this vector of residuals $\hat{\epsilon}$. The residuals from each regression in step #1 is a “residual variable”.
3. Estimate the following regression equation using the OLS estimator:

$$Y = a + bY_1 + cX + d\hat{\epsilon} + v$$

Where d denotes the vector of coefficients attached to the residual variables.

4. Test the following null and alternative hypotheses:

$H_0: d = 0$ (Y_1 is exogenous)

$H_1: d \neq 0$ (Y_1 is endogenous)

5. If there is one variable in Y_1 , and therefore one residual variable in $\hat{\epsilon}$ and one coefficient in d , then this hypothesis can be tested using a t-test. If there is more than one variable in Y_1 , and therefore more than one residual variable in $\hat{\epsilon}$ and more than one coefficient in d , then this hypothesis can be tested using a F-test.

Furthermore in the case of my model of ownership and performance I conducted the above mentioned exogeneity test using a t-test, because I had in my analysis only one variable in the respective Y_1 of my model.