



Ownership Structure, Corporate Value and Firm Investment: A Simultaneous Equations Analysis of Spanish Companies

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Abstract. This paper is concerned with the set of mutual relationships between firm valuation and investment, and with the possible endogeneity of ownership structure. In order to deal with them properly, we aim to test the mutual impact of investment, corporate value and ownership by broadening the usual framework with a simultaneous equations approach. Using a sample of 140 Spanish listed companies for the 1991–1997 period, we have found that, consistent with previous research, the alignment and entrenchment hypotheses seem to be confirmed by the estimation of a one-equation model. However, when analyzed by means of a system of simultaneous equations in which a set of mutual relationships is introduced, quite different results were obtained. Although valuation and investment of firms are determined by managerial ownership, we have found that ownership structure may also be influenced both by investment and value. Consequently, it is not completely right to infer that ownership structure determines firm value unidirectionally; however the benchmark should be broadened so as to take an explicit account of the mutual links between firm value, investment and ownership.

Key words: corporate value, firm investment, ownership structure and simultaneous equations

1. Introduction

Since the publication of the very famed Modigliani and Miller's irrelevance propositions more than forty years ago, the firm's value has been supposed to be an outcome of the assets performance and, hence, to be basically a result of the investment of the company. Hence, in the MM (1958) context of perfect capital markets, both capital structure and dividend decisions (and even ownership structure) had no effect on firm value. Nonetheless, while the relevant role played by financial structure and dividends have been often emphasized after the MM seminal paper, a number of papers underlining the relationship between firm ownership structure and value creation have emerged in the last two decades. As pointed by two outstanding papers, the managers stake in firm ownership can act as a mechanism with a decisive impact on the alignment of interests between owners and managers and therefore on firm market value (Morck et al., 1988; McConnell and Servaes, 1990).

In any case, the ownership structure analysis requires an explicit consideration of the frictions occurring in capital markets. Whenever the assumption of perfect capital markets is relaxed, taxes, bankruptcy and transaction costs as well as agency problems become relevant in such a way that ownership and control structure come to play an important role. In this framework it is widely accepted that firm market value is not only the result of firm investment projects but also depends on some other corporate issues such as financial structure or dividend policy. All these factors together make up the control structure of the firm and can modify firm market value. As a consequence, the managers' purpose of maximizing firm value – so common, at least theoretically, in most of the capital markets – requires to acknowledge the impact that ownership and control structure can have on firm valuation. Furthermore, in order to foster value creation, the causality relationship linking firm value and the set of ownership and financial decisions should be elucidated. This new role for ownership may be explained from two points of view: the agency and the asymmetric information. On the one hand, the agency approach conceives ownership structure as an instrument to alleviate the conflicts of interest among the main firm claimholders. On the other hand, the asymmetric information approach understands ownership structure as a way to reduce the informational unbalance between insiders and outsiders by the disclosure of information in capital markets (Leland and Pyle, 1977; Berström and Rydqvist, 1990).

Notwithstanding, the research about the link between managers' ownership participation and firm value is not conclusive and show two main directions for further research. Some papers find a non-monotonic relationship between the managers' participation and firm value, so that some doubts arise about the effects of an *a priori* alignment of interests that the managers ownership participation should imply. This is the reason for the so-called alignment and entrenchment hypotheses, thus justifying the opposite effect that can be caused by the managers' ownership (Morck et al., 1988). Secondly, as Jensen and Meckling (1976) suggest, investment decisions can act as a transmission mechanism between ownership and value. If such is the case, investment becomes affected by managers' ownership and has an impact on firm market value.

Investment is also related to firm value and even to ownership structure. In fact, the Tobin's q theory of investment, one of the most successful theories to explain corporate investment policy, is also based on the theories of value creation. This net of mutual relationships among investment, value creation and ownership structure poses the question of the causality and possible endogeneity of some of them.

Keeping all these considerations in mind, we plan a double analysis. Firstly, we are interested in the extent to which ownership structure (more specifically, managerial ownership) affects firm investment and valuation. Secondly, assuming that ownership structure could be an endogenous factor, i.e. a firm issue determined by some other firm characteristics, a whole analysis of firm ownership, investment and valuation has been carried out.

In other words, the interrelationship among investment, firm value and ownership structure is the very core of our paper in which we try to deal with the possible endogeneity of these issues in the light of recent research (Cho, 1998). We aim to use Cho's methodology so as to arrive to the factors that determine value creation, firm investment and managers' ownership, considering the possible endogeneity and doing a simultaneous estimation of all this set of interrelationships.

Our double analysis seems to highlight the existence of great differences between an individual and a whole estimation, thus pointing to some significant interconnection among the issues. The results also shed some doubts about the conclusions achieved by previous research since these might be based on a wrong specification of the ownership structure effect. We extend current research in two directions. First we test the set of interrelationships in the Spanish corporate system, rather different from the Anglo-Saxon one on which most of the previous research has been focused. In other words, it merits our attention a comparison of the features of Spanish corporate system to the Anglo-Saxon's. In the second place, our work adds a dynamic dimension since by combining cross-section data with time series, we have built a panel data for optimally exploiting the informational content of the sample.

In order to achieve these goals we have divided the paper into five sections. Section 2 analyzes previous research and presents theoretical foundations about investment, ownership and value relationship. In section 3 we pose some methodological issues along with a description of the sample and variables used, while in section 4 we show and comment the results obtained and report a sensitivity analysis to alternative specifications of the model. In the final section we draw some conclusions from the most outstanding results and point out some future directions for research.

2. Theoretical Foundations

As previously stated, this section explores the main theoretical foundations our contribution is based on and further on, especially highlighting endogeneity and mutual relationship. This section has been divided into three paragraphs, each one devoted to one of the basic points we are concerned with: firm value, firm investment and firm ownership structure.

2.1. VALUE CREATION

The attention paid by the modern financial theory to firm value has run parallel to a redefinition of firm objectives, so that firm market value (or firm claimholders wealth) maximization has become the new objective of the set of firm financial decisions. This is why firm value creation has been one of the most interesting subjects both for the academia and the practitioners in the latest decades. Finan-

cial theory has fuelled this debate by providing new insights on the relevance or irrelevance of financial decisions.

Whereas the initial debate focused on the three main strategic financial decisions (investment, capital structure and dividends), more recent research, especially contributions from the agency theory, has provided new insights on the problems arising from the ownership and control separation (Fama and Jensen, 1983). Owing to this new theoretical framework, ownership and control structure have become the core of the value creation process. From this point of view, Morck et al. (1988) and McConnell and Servaes (1990), based on contractual reasons, have contributed to explain firm value as an outcome of firm ownership structure and, in particular, of managers' ownership. The separation between assets ownership and control has some pros and some cons. The positive side of the separation is that it allows the advantages of specialization and allocates decisions to the most suitable people. Notwithstanding, it implies the divergence between the interests of managers and shareholders, giving rise to asymmetric information and managers' monitoring and control problems. Managers, instead of pursuing shareholders wealth maximization, are supposed to look for their own utility function and their behavior can be harmful for the company: perquisites extra-consumption, excessive firm business diversification, overinvestment, etc. (Jensen, 1986).

From a deeper perspective, basic foundations come from the idea of a firm as a nexus of contracts among different stakeholders, where the conflicts of interests arising between shareholders and managers are particularly relevant for determining firm market value (Jensen and Meckling, 1976). The separation between ownership and control in the companies alters the incentives scheme and leads to the interrelationship between ownership structure and firm value through investment (Cho, 1998; Ang et al., 2000). At a first stage, managers are fostered to an extra-perquisites consumption which negatively affects the optimal investment policy. At a second stage, this non-optimal level of investment affects the company valuation since firm value is placed at a non-optimal level.

Given this conflict of interests, the mechanisms that make both sets of interests converge become a crucial issue. Among the available mechanisms it is well-noted the ownership structure. The proportion of shares owned by the managers is an incentive in order to align their decisions and interests with those of the other shareholders. This relationship between managerial ownership and firm value has been empirically proved (Morck et al., 1988; McConnell and Servaes, 1990; Chen et al., 1993; Thomsen and Pedersen, 2000; for the Spanish case, Galve and Salas, 1992).

Although this relationship seems to be confirmed, it is far from being simple. Moreover, it usually has a non-linear shape or, in other words, the impact of the ownership on firm performance is contingent on the managerial ownership proportion. Some of the previously cited papers stress the asymmetric behavior of firm value depending on ownership and allows to support both the so-called alignment and the entrenchment hypotheses: while for low levels of managers' ownership

an increase in managerial ownership can help to the alignment of the divergent interests of insider and outside shareholders, for higher levels managers can avail themselves of their outstanding situation in the firm ownership so that a search for perquisites consumption is observed implying a decrease in firm value. The same literature underlines the importance not only of the quantitative distribution of ownership but also of the identity or nature of the main shareholders.

In any case, the relationship between ownership and value is not only an outcome of the convergence of interests, but can also be explained in terms of information disclosure and of signaling theory (Leland and Pyle, 1977). In this sense, ownership structure may facilitate investors to have access to information about the future investment projects of the companies and therefore influence firm market value. Stulz (1988) also reaches analogous conclusions through the corporate control market, broadening the concept of ownership structures so as to embrace the distribution of rights to vote and its impact on takeover successes.

2.2. INVESTMENT

As we mentioned before, investment is one of the most relevant channels through which ownership structure may have an impact on value creation. Therefore, besides the influence of managers' ownership on investment, we should identify some other factors which might potentially affect the investment undertaken by companies.

Regarding ownership influence, there are a few proofs of a direct and non-monotonic relationship between firm investment and ownership structure (Cho, 1998; Hadlock, 1998). Most of the research, however, has been done following an indirect path heading for the financial constraints of investment due to ownership structure (Devereux and Schiantarelli, 1990; Hoshi et al., 1990a and 1991; Ramirez, 1995). When financial constraints tighten, we observe a connection between investment and some issues concerning ownership (for instance, the ownership dispersion or the nature of the main shareholder).

Ownership structure becomes a factor altering the disposal of funds and therefore, those investment projects the firm might perform. The link between ownership structure and asymmetric information is the factor that gives relevance to issues such as the firm internal generation of resources (Calem and Rizzo, 1995; Calomiris and Hubbard, 1995; Kaplan and Zingales, 1995), the firm liquidity (Fazzari et al., 1988; Hoshi et al., 1990b) or the firm debt (Calomiris et al., 1994; Lang et al., 1995). Broadly speaking, most of the literature confirms the existence of a positive relationship between q ratio and investment, although it is not so significant and consistent as might be expected.

2.3. OWNERSHIP STRUCTURE

While there is a substantial literature about the effect of ownership structure on firm value and performance, there is less research into the determinants of ownership structure. In fact, most of the papers related to ownership structure have considered the ownership structure as an exogenous or explanatory variable. It is worth keeping this evidence in mind since it might help to trace the link between ownership structure and some other firm issues. So, a considerable part of the literature concerning this subject has analyzed the positive effect that managerial ownership has on value creation (Chen, 1990; Morck et al., 1988; McConnell and Servaes, 1990). Some other papers are involved in other corporate financial issues such as the link with investment risk (Agrawal and Mandelker, 1987), with leverage (Agrawal and Mandelker, 1987; Agrawal and Nagarajan, 1990) or with dividend payout (Chen and Steiner, 1999).

Furthermore, the contributions focused on the factors affecting ownership structure have highlighted the impact that firm size and uncertainty have on the managerial ownership proportion and on the percentage of shares owned by blockholders (Demsetz and Lehn, 1985). At the same time, it has been proved that ownership structure depends on the firm size (Lange and Sharpe, 1995) or its performance (Berström and Rydqvist, 1990).

Recently some new insights about ownership structure have shed some light not only on the consequences but also on the factors affecting ownership structure, so that it is increasingly clear that ownership structures vary and that they have an outstanding influence on firm behavior (Shleifer and Vishny, 1997). Based in such different theoretical frameworks as agency theory or political theory of corporate ownership (Roe, 1991), ownership structure is supposed to be an outcome of a number of factors: the level of investors' risk, the severity of the asymmetric information problems, the uncertainty involved in assessing managers' performance, the control preferences of owners and managers and the legal protection of minority shareholders. This might explain that ownership concentration is related to a number of factors, both economic factors (firm size, profit volatility, government supervision, owners' preferences) and system factors (nation effects, regulation, characteristics of the financial system, etc.) as pointed by Pedersen and Thomsen (1999).

The impact of firm value on ownership structure has been justified by Krole (1994). This author argues that the higher the performance of the firm or the market value of the shares, the more interested managers are in owning a fraction of the shares of the company. Consequently, managers in firms with higher market value or with better performance will be willing to hold a larger proportion of firm's shares. This hypothesis has been empirically confirmed by Cho (1998).

3. Research Design

3.1. SAMPLE

Our sample includes 140 non-financial Spanish companies trading in capital markets for the 1991–1997 period (around, two thirds out of quoted companies). The process of sample selection was done considering the market data significance and the information availability on ownership structure.¹ The combination of the 140 companies within a seven years period has allowed us to form an unbalanced panel data in accordance with the appropriate panel data methodology (Mátyás and Sevestre, 1992). Given that the panel is not balanced – that is to say, not all data were available every year –, the total number of observations was 764. The information source used was the *Comisión Nacional del Mercado de Valores* (Spanish Stock Exchange Regulatory Body), hereinafter CNMV. All the data are publicly available and have been obtained from the Register of Companies, the Register of Significant Ownership Participation and the Audited Financial Statements.²

Some observations on the Spanish capital markets benchmark, especially some peculiarities related to our results and to the interpretation of the results seem necessary before offering additional explanations of our sample. It is widely known that the variation in the form of the financial system constitutes one of the most outstanding differences between developed countries (Allen and Gale, 1995, 2000). Financial and corporate systems are classified depending on the rules covering protection of corporate investors – both shareholders and creditors –, the origin of these rules and the quality of their enforcement (La Porta et al., 1998). From this point of view, there are four main types of systems: the English origin system, the French origin one (to which the Spanish financial system belongs), the German origin one and the Scandinavian origin one.

Another classification relies on the role of the financial intermediaries in the net of relationships between banks and firms. Thus, there are two main systems: the Continental or bank-oriented system vs. the Anglo-Saxon or market-oriented system.³ Differences between them are prominent and include both firm characteristics and households.

Most of the previously existing empirical evidence concerning ownership structure focuses on the U.S.A. and other market-oriented countries. This article expands the available information on bank-oriented systems such as the Spanish one. Perhaps an important difference between both systems is the ownership concentration (Galve and Salas, 1996; Andrés, 1998). For example, in 52% of American companies the main shareholders own less than 10% of the shares (Berglöf, 1990), while that figure occurs only in 9% of the Spanish firms. In other words, the main shareholders' stake is more than 50% in 9% of the American companies but rises to 43.9% in the Spanish firms.

Differences remain as far as leverage is concerned. Although a process of convergence could be made out, based on the B.A.C.H.⁴ database, Andrés and López (1997) show that, on average, the debt-to-equity ratio was 0.87 in the U.S.

Table I. Descriptive statistics. Descriptive statistics for the 140 Spanish firms data throughout the 1991–1997 period. Some data about ownership variables are also reported in Table II. Assets and sales in millions of pesetas (1 € = 166.386 pesetas)

	Mean	Std. dev.	Minimum	Maximum
INVP	0.3123	19.7736	−35.7556	0.9990
INVIN	−0.0283	0.2498	−4.5522	0.8182
INSI1	9.4624	9.0069	0	20
INSI2	7.1427	11.5059	0	30
INSI3	2.8155	8.8972	0	50
logAST	10.4234	1.5913	6.1463	15.2592
LEV	1.6717	4.6350	0.0053	70.3836
LIQ	0.4109	0.2494	0.0008	0.9751
ROA	0.0257	0.1192	−1.7454	0.39588
Q	1.0113	1.6455	0.0004	21.3067
ALFA	19.4207	25.1337	0	100
Assets	77,681.268	319,330.21	29	4,236,416
Sales	38,188.182	125,067.675	0	1,605,101

firms, whereas the same ratio for Spanish firms was 1.32. At the same time, the market debt-to-total debt was 74.49% in the U.S.A. environment vs. the 29.94% in Spain. All these differences are statistically significant at the 99% confidence level.

Another noticeable difference concerns the identity of the main shareholder. Kester (1993) reports that, on average, 53.5% of the shares of American companies were in the hands of individuals and families, and pension funds and assurance companies owned 34.3%. On the contrary, Spanish households and pension funds own only 21.8% and 10.7% of the shares, respectively. However, interblock holding is very outstanding so that 45% of the companies are controlled by another company (Salas, 1998). The exchange of blocks is usual in Spain but, unlike the U.S.A. market, there are almost no hostile takeovers.

Although the aim, theoretical argumentation and applied methodology of this research rely on Cho's paper (1998), there are peculiarities in our sample deviating from Cho's: our sample covers seven years, thus allowing a dynamic estimation through the panel data methodology.⁵ In addition, our sample is much more diversified across industry categories and combines data from 12 industries. As Table I shows, the companies in the sample are basically medium-to-large companies relative to the average Spanish firm size either in terms of sales or assets. The composition of the sample is quite industry-balanced, with a slight bias towards *Building* firms at the expense of *Trade and retailing* companies. This proportion is the result of the heavier concentration of *Building* firms in the Spanish market.

Table II. Corporate ownership descriptive statistics. Main shareholder fraction refers to the percentage of shares owned by the largest shareholder irrespective of his/her status or nature. Directors' fraction is the percentage of outstanding shares owned by the members of the board of directors. Ordinary directors' fraction is the proportion of shares held by ordinary people sitting at the board and excluding banks, firms and other legal entities

	Domestic	Multinational	Family	Banks	State	All
Main shareholder fraction	46.28	58.86	26.03	38.81	53.17	44.45
Directors' fraction	16.79	17.44	37.35	5.38	13.34	19.42
Ordinary directors' fraction	4.07	3.37	33.52	1.91	0.47	9.57
% of companies	24.21	24.33	21.79	17.07	12.59	100

Table II presents some illustrative data about the ownership structure of Spanish companies. We have classified the status of the main shareholder into five different categories: other domestic non-financial firm, a multinational firm, a family, private individual or group, a bank and the country. Some characteristics of the Spanish corporate system should be kept in mind. This system has much in common with the European models of corporate governance and does not show so much ownership and control specialization as the Anglo-Saxon one. In Spanish companies, like in other European countries, ownership is more concentrated (Allen and Gale, 1994; Berglöf, 1990); there are significant blockholders (Becht and Röell, 1999) and banks play an active role in funding and monitoring (Prowse, 1994).

Table II shows three worth noticing features: (1) The outstanding fraction of shares owned by corporate board directors (on average, they own a 18.94% of total shares and, in family-controlled firms, they own a 37.35%). If we establish the comparison in terms of natural people, the results are a bit lower but conclusions remain unchanged. (2) The outstanding fraction of shares owned by the main shareholder (the average main shareholder fraction of total shares is 44.45%; this percentage increases up to more than half of the shares for State owned companies and for firms subsidiaries of multinational companies). This implies a majority control as in the case of France, Germany or Italy and different from that of the U.S. system (Berglöf, 1990; La Porta et al., 1999; Prowse, 1994); (3) The importance of other companies – whether domestic or multinational firms – (24.21% and 24.33% of the companies) as the main shareholder relative to the country (only 12.59%).

Compared to Anglo-Saxon companies these features imply a lower separation of ownership and control. On the one hand, agency problems stemming from ownership and control separation might be smaller than in U.S. companies. However, on the other hand, some problems such as risk concentration, the foregoing of specialization advantages (managers ability, specific investment, etc.) in the face of profitable growth opportunities (Burkart et al., 1997) or the expropriation of minority shareholders (La Porta et al., 1999) might arise.

Table III. Firm characteristics grouped by managerial ownership. Number of companies in each group according to the managerial ownership, average managerial ownership, average proportion of shares owned by the main shareholders, average investment in PPE and intangible assets (relative to total assets), average financial q ratio and average cash flow (scaled by total assets)

	# of firms	Average directors ownership	Main shareholder fraction	INVP	INVIN	Q	CF
Alfa < 20	86	4.79	27.23	0.3530	-0.083	0.619	0.012
20 = Alfa < 50	39	32.71	41.29	0.1697	0.011	1.151	0.034
50 = Alfa	15	66.85	60.98	0.1507	0.003	1.843	0.052

Finally, Table III presents some characteristics of the companies for the three groups the whole sample has been divided into. There is a little bias towards levels of managerial ownership under 20%. Although not reported in Table III, there are 46 firms whose directors own less than 10%. We can also see that the higher the managerial ownership, the higher the market value of the company relative to its book value. In addition, consistent with Cho (1998) results, Property, Plant and Equipment (hereinafter PPE) investment seems to be less volatile than the investment in intangible assets.

3.2. VARIABLES

Four groups of variables were considered in accordance with the information supplied by the CNMV: (1) firm market valuation, (2) firm investment, (3) ownership structure and (4) control variables. Some issues related to the specification of the variables and some of their most informative statistics are briefly described. A glossary of all the variables and how they have been defined can be found in the appendix, whereas Table I shows some of their basic statistics.

Firstly, and with respect to value creation, we have used the financial q or market-to-book asset ratio (Q). The use of Tobin's q ratio would have been preferable without any doubt. Nevertheless, the problems related to the calculation of both debt market and asset replacement value are extremely demanding and advice the use of other correlated measures. On the contrary, financial q stems from an easy calculation and provides a value creation index which is highly correlated to Tobin's q .⁶

In any case, both Tobin's q and the financial q are generally understood as indicators of value creation (Morck et al., 1988). Since they reflect investors expectations about the firm's ability to generate cash flows they incorporate investment projects and this is why they are also considered as indicators of growth opportunities at the firm's disposal (McConnell and Servaes, 1995). Notwith-

standing, results must be analyzed with caution because these variables rely on the market value and, as previously explained, Spanish capital markets are not so liquid (and even not so efficient) as the Anglo-Saxon markets.

Regarding investment – the second key variable of the research –, the measure was obtained by using two different variables: investment in Property, Plant and Equipment (INVP) and investment in long-term intangible assets (INVIN).⁷ For each year INVP has been computed as the incremental value of PPE plus depreciation and amortization, whereas INVIN has been computed as the incremental value of intangible assets plus depreciation. Both variables have been normalized by the book asset value.

The ownership structure variable was obtained from the proportion of total shares owned by the members of the board of directors (ALFA). This variable obviously proxies the incentives that the directors have to perform an efficient monitoring task. Since not all the directors are executives and there are a number of managers who do not sit at the board, ALFA is just a proxy of managers' ownership. A more accurate variable would have been the proportion of shares all managers own. However, Spanish companies do not report managers' but directors' ownership, so that this is the closest available proxy to managers' incentives.

As literature illustrates repeatedly, the link among ownership distribution and other firm aspects may be conditional on the level of insider ownership in some specific moments. This is why, following Morck et al. (1988), we will undertake a piecewise analysis by defining some significant break-points or thresholds. Hence, we have defined three variables (INSI1, INSI2 and INSI3) aimed to reflect the different influence of ownership structure depending on the level of managerial ownership. The levels of ownership chosen as breakpoints are 20% and 50%.⁸ INSI1 equals the percentage of shares that directors own provided that this percentage is less than 20%. Otherwise, INSI1 equals 20%. INSI2 is defined as equaling the percentage of managerial ownership minus 20% provided that directors do not have more than 50% of the shares. Otherwise INSI2 equals 30%. Obviously, if insider ownership is under 20%, INSI2 is zero. Finally, INSI3 is computed as the percentage of shares that directors own minus 50% on condition that managerial ownership is higher than 50%; otherwise INSI3 is zero.⁹

We have also introduced a set of control variables as factors that are likely to affect the performance or the investment of firms. All these variables will be incorporated in all the regressions. This should be reminded in case some of them might sometimes be considered irrelevant or lacking of theoretical rationale. In any case, the significance of control variables is not the central part of this paper and these variables are used just to avoid an omission bias, so their inclusion does not have much relevance.

The first control variable refers to leverage or capital structure and is usually defined as debt-to-equity book value (LEV). Another control variable is firm size. It is usual to measure firm size as assets value. Nevertheless, given that we have used the assets book value as a denominator to scale investment variables and the

financial q ratio, in case firm size was wrongly measured, a false negative relationship might appear. To alleviate this problem we compute firm size as the logarithm of assets book value (LogAST). Another relevant aspect of control variables is firm liquidity (Fazzari et al., 1988; Hoshi et al., 1990b). It has been obtained from the short-term to total assets ratio (LIQ). A last control variable is an indicator of firm profitability which allows us to reflect the impact of profitability on the value and investment of firms; the variable selected in this case has been the return on assets (ROA). Besides we added a set of dummy variables relative to the industry to which the firm belongs.¹⁰

3.3. METHODOLOGY

In order to describe the methodology, it must be taken into account that one of the goals of our research is to determine the scope of influence exerted by ownership structure (either on investment or in firm value). This is why, empirically, the methodology used to test the relationships proposed is fairly similar to Cho's (1998), and follows two steps.

Firstly, we estimate multivariate models consisting of one single equation in which both firm value and investment have been made to depend on ownership structure. These equations are:

$$Q_{it} = \beta_0 + \beta_1 \text{INSI1}_{it} + \beta_2 \text{INSI2}_{it} + \beta_3 \text{INSI3}_{it} + \varepsilon_{it} \quad (1)$$

$$\text{INV}_{it} = \beta_0 + \beta_1 \text{INSI1}_{it} + \beta_2 \text{INSI2}_{it} + \beta_3 \text{INSI3}_{it} + \varepsilon_{it} \quad (2)$$

The methodology of this first stage deviates from the one used by Cho since the estimation of one single equation allows us to introduce the panel data method. Basically, panel data estimation is advisable since it deals with the problem of unobservable and constant heterogeneity. By using the panel data methodology we can detect unobservable and fixed effects linked to each firm and constant throughout time. This fixed effects are helpful to explain the cross-section variation in the dependent variable (either value creation or firm investment). Although further comments will be presented in Section 4, a reference to the Hausman test might be pertinent in order to clarify the interpretation of the results. The key point in the panel data methodology is to check the correlation between the fixed effects term and the explanatory variables and it raises two alternative estimation models: the fixed *vs.* the random effect model. If the hypothesis of lack of correlation is rejected, the fixed model or within groups estimation applies. Otherwise, the best estimation is provided by the generalized least squares method.

Nevertheless since recently certain doubts have been posed about what direction the causality in equation (1) runs (Loderer and Martin, 1997; Cho, 1998), we will also test the effect of the q ratio on managerial ownership in order to be sure of the direction of the causality.

Once we have checked the rationality of these first results, the second step of the analysis attempts to achieve a more in-depth knowledge about the mutual

relationship among investment, ownership structure and market value. The reason behind this is to discern, at least partially, the possible endogeneity of ownership structure or, in other words, to what extent ownership structure may be an outcome of firm value and investment. This second step is the estimation of the system of simultaneous equations including the three issues. By so doing, we can check, in comparison with the results of the single-equation model, the possible endogeneity of ownership and the direction of causality. This is the core of the paper and the estimation of a system of simultaneous equations allows us to control for this endogeneity problem (Cho, 1998).¹¹ Therefore, the system of simultaneous equations would consist of the following equations:

$$\begin{cases} Q_{it} = \beta_0 + \beta_1 \text{INSI1}_{it} + \beta_2 \text{INSI2}_{it} + \beta_3 \text{INSI3}_{it} + \beta_4 \text{INV}_{it} + \varepsilon_{it} \\ \text{INV}_{it} = \beta_0 + \beta_1 \text{INSI1}_{it} + \beta_2 \text{INSI2}_{it} + \beta_3 \text{INSI3}_{it} + \beta_4 Q_{it} + \varepsilon_{it} \\ \text{ALFA}_{it} = \beta_0 + \beta_1 \text{INV}_{it} + \beta_2 Q_{it} + \varepsilon_{it} \end{cases} \quad (3)$$

INV stands for both investment in PPE (INVP) and investment in intangible assets (INVIN). In fact, most of the analysis will be carried out simultaneously for both kinds of investment. Finally, a paragraph with a sensitivity analysis has been included. With this analysis we intend to check the robustness of the results subject to different variables and specifications of the model.

4. Results

4.1. CORPORATE VALUE REGRESSION

The initial step has been the estimation of a possible non-monotonic relationship between firm value and managerial ownership as we find represented in equation (1). The first column of Table IV shows that firm value grows with insiders' ownership whenever managers own either less than 20% or more than 50% of the total shares. On the contrary, when insider's ownership is placed between 20% and 50%, a negative relationship is observed. The estimators are only statistically significant for INSI2 and INSI3. These results are totally consistent with those of Cho (1998) and Morck et al. (1988).

We performed another estimation including all the control variables mentioned above. As the second column in Table IV reflects, ownership variables are still significant – INSI2 is even significant to a higher level of confidence – and firm size and leverage appear as significant determinants of firm value, consistent with previous evidence obtained for Spain (Andrés et al., 2000). As regards the explanatory power – adjusted-R² coefficient –, the inclusion of control variables makes it to increase notably, changing from 38% to 59%.

Hausman test allows rejecting, to a high confidence level, the null hypothesis of no correlation between the term of individual fixed effects and the other independent variables. When correlation is observed (fixed effects model), the *within groups* estimation may be convenient in order to take the best advantage of the

Table IV. Ownership structure and corporate value regression. Fixed effects model (within groups estimation). Results in the panel data estimation of equation (1) are in the two left side columns (the dependent variable is corporate value). The two right side columns report the results for the estimation of ownership structure as a function of corporate value (the dependent variable is the percentage of shares owned by managers). *t*-statistics are in parenthesis. *** stands for *p*-value <1%; ** for *p*-value <5%; * for *p*-value <10%. Hausman test distributes as a chi-squared function with so many degrees of freedom as estimated coefficients. All the regression include industry dummy variables: Food and Beverage, Building, Property, Transportation and Communication, Electrical, Chemicals, Metal-mechanical, Mining, Textile and Paper, Automobile and Trade and Retailing

	Corporate value		Insider ownership	
Intercept	0.6775 (2.6314)***	2.1699 (2.6937)***	26.2185 (7.3092)***	43.0815 (3.4099)***
INSI1	0.0136 (0.3161)	0.38E-02 (0.0984)		
INSI2	-0.0235 (-1.7106)*	-0.0279 (-2.2309)**		
INSI3	0.0125 (2.4803)**	0.0114 (2.4737)**		
Q			0.5606 (1.0395)	0.1943 (0.3548)
Firm size		-0.1649 (-2.2706)**		-1.6109 (-1.4361)
Leverage		0.0659 (11.5803)***		-0.2006 (-1.2521)
Liquidity		-0.1964 (-0.5829)		0.2910 (0.0537)
ROA		0.3627 (1.1166)		-3.9344 (-0.6649)
no. obs	132	132	132	132
Adj.-R ²	0.3806	0.5953	0.524	0.521
Hausman test	19.029**	40.807***	13.074***	17.016***

Table V. Investment regression results Results in the panel data estimation of equation (2). PPE investment estimations are reported in the two left side columns (the dependent variable is corporate value), while intangible assets investment estimations are reported in the two right side columns. *t*-statistics are in parenthesis. *** for *p*-value <1%; ** for *p*-value <5%; * for *p*-value <10%. Hausman test distributes as a chi-squared function with so many degrees of freedom as estimated coefficients

	PPE investment		Intangible assets investment	
Intercept	-2.1453 (-2.9194)***	-0.0297 (-0.7783)	0.49E-02 (0.3984)	-19.4872 (-2.8863)***
INSI1	0.1338 (1.1863)	0.46E-03 (0.6396)	0.13E-02 (1.3109)	0.46E-02 (0.0388)
INSI2	-0.0966 (-1.3341)	-0.14E-03 (-0.2239)	-0.10E-02 (-1.8041)*	-0.0366 (-0.3314)
INSI3	0.0350 (0.5678)	0.31E-03 (0.2895)	0.12E-02 (1.3074)	0.55E-02 (0.0286)
Firm size		0.87E-02 (2.7053)***		1.2936 (2.3057)**
Leverage		0.01E-03 (0.2826)		0.0663 (0.6448)
Liquidity		-0.0628 (-3.2005)***		-4.1473 (1.2296)
ROA		0.1271 (4.6098)***		1.5775 (0.2757)
No. obs	140	140	140	140
Adj.-R ²	0.036	0.1821	0.002	0.032
Hausman test	6.0577	27.657***	0.9365	6.1566

dynamic dimension of the panel data (Mátyás and Sevestre, 1992). In other words, the Hausman test reveals an unobservable component for each individual. This term is specific to each firm and constant throughout time, and has been highlighted by Himmelberg et al. (1999). These authors stress the large fraction of cross-sectional variation in managerial ownership due to the unobserved firm heterogeneity.

Thus, in the light of the results presented up to now, we can conclude that our sample is quite consistent with samples from previous research. We also infer that the results in the regression of corporate value, focused on a continental corporate system such as the Spanish one, corroborate the existing evidence from the Anglo-Saxon corporate system.

Despite these preliminary results, some doubts might still remain about the kind of relationship between firm value and ownership structure. This poses the question about the direction of causality such relationship implies. To treat this matter properly we have considered the opposite relationship, where the Q variable is the explanatory value, while the managerial ownership plays the role of dependent variable (the two columns on the right in Table IV). Results are not significant at all and firm value does not seem to have a serious impact on firm ownership distribution. Table IV considered as a whole emphasizes the exogeneity of ownership structure: there is a clear link between ownership structure and market value; moreover, managerial ownership may be considered a key explanation of this relationship.

4.2. INVESTMENT REGRESSION

The estimation of the possible relationship between firm investment and ownership structure has been analyzed through equation (2) (Table IV). While the two columns on the left reflect the results for PPE investment, the two columns on the right refer to long-term intangible assets investment. The results show the lack of correlation between ownership structure and firm investment. It can be observed that, regardless of the presence of the control variables, ownership structure has no noticeable influence on investment. Despite this lack of significance, we should pay attention to the switching sign of INSI1, INSI2 and INSI3 variables, what could be understood as an indicator of a possible non-linear influence of managerial ownership on firm investment.

The lack of significance still remains when the set of control variables is added. In this case, the most outstanding variables are firm size, liquidity and performance. As regards firm size, the larger the company is, the higher the investment is. At the same time, assets performance has obviously a positive effect on firm investment. As for liquidity, a negative relationship can be observed. Although this finding might be seen as contradictory, it can be justified by the investment definition. If liquidity proxy is defined as short-term assets (as opposed to long-term assets), long- and short-term assets could be understood as mutually competitive for financial resources. For this reason, instead of fostering the investment process,

firm liquidity becomes a way of using firm funds alternative to PPE or intangible long-term assets.

To sum up, unlike Cho (1998), our results do not support any relationship between insider ownership and firm investment.¹² Therefore, at this stage of the analysis it could be thought that there is a direct relationship between firm value and ownership structure, so that investment does not have much to do with any of them.¹³

4.3. SIMULTANEOUS EQUATIONS SYSTEM

Though many papers show a significant effect of ownership structure on firm value, certain doubts have been recently raised about the exogeneity of ownership issues. The contributions of Demsetz and Lehn (1985), Kole (1994) and Himmelberg et al. (1999) demonstrate the endogeneity of ownership structure, in opposition to Morck et al. (1988) and McConnell and Servaes (1990). Therefore, we should wonder if ownership structure could not only affect firm value but also be affected by it. This idea is consistent with evidence from Murphy (1985) and especially from Kole (1994) since it suggests that insiders may show a preference for equity compensation whenever they expect an increase in the firm market value.

In this case, the assumption about ownership exogeneity could lead to wrong conclusions as regards the causality of the ownership-value link. In fact, a “false attribution of causality can lead to a misinterpretation of the relation between ownership structure and corporate value and to incorrect management decisions, such as a compensation policy that emphasizes stock grants to the executives” (Cho, 1998, p. 106).

To test this hypothesis, we propose a set of mutual relationships among ownership structure, firm value and investment. From an econometric point of view, the endogeneity of ownership structure involves the possibility that previous estimations may be incorrect and raise the need for a global analysis of the whole set of relationships by means of the system of simultaneous equations presented in section 3.3.

It is worth noticing the inclusion of investment as an explanatory variable in equation (3) and the inclusion of financial q ratio in equation (4). As stated before, firm investment is likely to be affected by firm performance. Therefore, the higher the market value relative to the book value is, the more important the incentives to invest will be and hence the chances that there may be a positive relationship between Q and investment.

Concerning equation (3), in case the non-linear influence of insiders ownership on firm value held, the INSI1 and INSI3 coefficients should be positive, whereas the INSI2 coefficient should be negative. At the same time, INV is supposed to have a positive impact on firm value as long as investment is a way of taking advantage of the growth opportunities reflected by the market-to-book ratio (Berger and Ofek, 1995; Lang and Stulz, 1994; Smith and Watts, 1992).

Analogous explanations can apply to equation (4). If the lack of relationship previously observed between ownership structure and investment continued, the newly estimated coefficients should be non-significant. On the contrary, if a mutual relationship might exist, INSI1, INSI2 and INSI3 coefficients should be significant, although their sign is quite difficult to be predicted. As regards financial q ratio, the coefficient is supposed to be positive given the positive impact that market insights of future growth opportunities have on investment.

As for equation (5), it is very likely that as long as firm market value increases, managers will be more interested in having possession of an increasing proportion of shares. A possible conclusion is the positive influence of Q on managerial ownership. It is unlikely that we may find a direct influence of investment on insider's ownership. However, if we accepted the positive relationship between investment and firm value, we should forecast a positive coefficient for the Q variable.

The results on the estimation of the simultaneous equations system by the two stages least squares method can be seen in Table VI. The two columns on the left refer to PPE investment, while those on the right have been estimated with data from the intangible assets investment. Although there are slight differences between both estimations, broadly speaking, results are very consistent. As reported, results are notably different to those in sections 4.1 and 4.2 and throw serious doubts about ownership structure exogeneity.

Equation (3) presents results quite similar to those achieved at the estimation of equation (1). The non-monotonic relationship between firm value and insiders' ownership is confirmed: while INSI1 and INSI3 have positive coefficients, INSI2 presents a negative relationship with firm value. Coefficients are significant with high reliability and its significance increases when the set of control variables is added. This fact could be interpreted as suggesting an omission bias if control variables were excluded. As we anticipated, investment is positively related with firm value, although the coefficient is only significant for PPE estimation.

Among the control variables it is worth underlining the dual role leverage plays. While it has a positive impact on firm value for PPE investment equations, the role is just the opposite for intangible assets investment. This result is not senseless and previous literature has provided related evidence (Smith and Watts, 1992; Gaver and Gaver, 1993; Gul, 1999).

Whereas the single equation of corporate value (1) has much in common with that in the system of simultaneous equations (3), the results from the estimation of equation (4) have little to do with those from equation (2). As Table VI shows, both PPE and intangible assets investment are strongly determined by firm ownership structure. Firstly (columns 1 and 3), the managerial ownership effect is conditional on the proportion of shares owned by insiders. Although non-significant, INSI1 and INSI3 have a positive effect, while the INSI2 impact is negative. This asymmetric relationship becomes more evident on adding control variables. If such is the case, an average of managerial ownership fewer than 20% or over 50% has a positive and significant influence on investment while managerial ownership ranging from 20%

Table VI. Simultaneous equations estimation results. Results in the estimation of the system of simultaneous equations using the method of two stages least squares. PPE investment results are reported in the two left side columns, while intangible assets investment estimations are reported in the two right side columns. In order to make use of the most suitable instruments we have chosen as instruments the contemporaneous exogenous variables in each equation and the industry dummies (not reported in table).^a *t*-statistics are in parenthesis. *** stands for *p*-value <1%; ** for *p*-value <5%; * for *p*-value <10%

Corporate value				
Intercept	-0.1365 (-0.2714)	-0.5534 (-0.3337)	2.1304 (5.8875)***	5.5221 (4.2712)***
INSI1	0.2127 (1.9678)**	0.3153 (20.2086)**	0.1224 (2.0878)**	0.3008 (2.8310)**
INSI2	-0.1986 (-1.8416)*	-0.3282 (-2.5912)**	-0.2400 (-2.4326)**	-0.1441 (-2.4007)**
INSI3	0.2470 (1.5202)	0.4599 (2.4527)**	0.0637 (2.4792)**	0.0395 (1.6272)*
Investment	9.5655 (2.1161)**	4.1043 (5.8796)***	0.6319 (0.1344)	4.8042 (0.9276)
Firm size		0.0872 (0.7296)		-0.2819 (-3.1519)***
Leverage		0.1291 (6.4721)***		-0.1064 (-2.5910)***
Liquidity		-1.0555 (-2.1624)**		-0.8248 (-2.4548)**
ROA		2.0526 (2.3443)**		2.2526 (2.8234)***
No. obs	763	754	762	753
Adj.-R ²	0.002	0.001	0.004	0.009
Investment				
Intercept	0.0734 (3.8156)***	-0.2230 (-2.3061)**	-0.0401 (-1.0632)	0.2804 (0.3987)
INSI1	0.53E-02 (1.0906)	0.0230 (2.8791)***	0.18E-02 (0.2124)	0.3034 (3.4396)***
INSI2	-0.31E-03 (-0.0644)	-0.0199 (-2.8619)***	-0.29E-02 (-0.5750)	-0.2940 (-3.5198)***
INSI3	0.52E-03 (0.0726)	0.0314 (3.1541)***	0.11E-02 (0.0830)	0.49E-02 (3.3670)***
Q	0.0170 (2.0431)**	0.0251 (2.4988)**	0.38E-02 (1.8095)*	0.3476 (4.5969)***
Firm size		0.0187 (2.9632)***		0.26E-02 (0.6745)
Leverage		0.44E-02 (2.4985)**		0.0204 (3.9167)***
Liquidity		-0.0714 (-3.0025)***		-0.33E-02 (-1.6917)*
ROA		0.1603 (3.4133)***		0.0196 (3.2610)***
Adj.-R ²	0.006	0.002	0.016	0.010
Ownership structure				
Intercept	0.2666 (9.6482)***	0.5612 (7.0394)***	0.2593 (10.9838)***	0.7685 (6.8510)***
Investment	1.3901 (3.0126)***	0.9975 (2.0410)**	0.9488 (1.6759)*	0.1892 (4.0042)***
Q	0.0149 (0.6947)	0.0579 (2.8129)***	0.0526 (2.5980)***	0.0364 (5.2810)***
Firm size		-0.0356 (-5.1496)***		-0.0483 (-1.5941)
Leverage		-0.44E-02 (1.4155)		-0.61E-02 (1.7253)*
Liquidity		0.0290 (1.3901)		0.0317 (0.9321)
ROA		-0.2205 (-1.9850)**		-0.0417 (-0.7872)
Adj.-R ²	0.006	0.004	0.015	0.008

^aAlthough we have tried to use as instruments only the exogenous dependent variables, we should not forget that some of these variables, e.g. leverage, might also be endogeneous (Himmelberg et al., 1999). We thank one of the referees for this comment.

to 50% affects investment negatively. To some extent these results are consistent with Jensen and Meckling (1976) and Jensen (1986) and highlight the non-linear relationship between investment and ownership. This non-monotonic relationship can be seen as the outcome of a kind of *trade-off* between overinvestment and managerial ownership incentives.

In equation (4), Q has a positive and significant influence on investment, consistent with previous research (Fazzari et al., 1988; Devereux and Schiantarelli, 1990; Schaller, 1993; Blundell et al., 1992).¹⁴ Another variable with a significant effect on investment is leverage and it confirms the existing evidence for Spanish capital market (Menéndez, 1996). The reason underlying this result is the leverage conceived as a way of loosening the possible internal financial constraints to investment. The negative influence of liquidity is related to the way this variable was calculated as we explained in section 4.2.

Before explaining equation (5), we should take some precautions. Whereas in equation (3) and (4) a non-linear relationship was tested, in equation (5) the dependent variable is managerial ownership, a continuous variable in which no break points are defined, and this could partially distort the set of estimated relationships. In any case, the outstanding role played by investment and firm value is confirmed, bringing some doubts on the hypothetical exogeneity of ownership structure. We may predict that both variables have a positive influence on managerial ownership. Another warning concerning the whole system of simultaneous equations is the extremely low explanatory power of the model (adjusted- R^2 coefficient).

To conclude this section we can sum up all the previous assertions by stating that ownership structure, rather than being an exogenous issue that may potentially affect firm value, is determined both by firm value and investment. Therefore, previous analyses about the influence of ownership structure on capital structure (Harris and Raviv, 1988), investment (Schaller, 1993) or dividend payout (Noronha et al., 1996) could imply certain errors due to the omission of reversal causality. Hence, a whole and simultaneous consideration of all financial decisions and the ownership structure might be pertinent so as to find out their mutual relationships.

4.4. SENSITIVITY ANALYSIS AND ROBUSTNESS TESTS

One of our concerns is the strength of the results, that is to say, the extent to which the evidence found is contingent upon the specification of the equations, the definition of the variables or the method of estimation. For this reason we have incorporated a sensitivity analysis section to make sure of the strength of the results and to avoid the suspicion of spurious correlation. Given the high number of new estimations, for the sake of brevity we have not reported the results obtained but they are available to the interested reader.

In the first place, we have proposed an alternative specification of ownership variables. We have defined two dummy variables (INS1 and INS2) equaling 1 or 0

when insider ownership is fewer than 20% or between 20% and 50% respectively.¹⁵ As we said before, the substitution of INSI1, INSI2 and INSI3 for INS1 and INS2 hardly affects the results: when insider's ownership is under 20% there is a positive correlation between ownership on one side and corporate value and firm investment on the other. On the contrary, if managerial ownership stays between 20% and 50%, a negative relationship appears. At the same time, both investment and corporate value seem to hold a positive relationship with managers' ownership. With respect to control variables, no further comments are required given that they continue with a similar role. We would just like to emphasize again the dual role for leverage: it has a positive effect on firm value as regards the system of equations for PPE investment, while the impact is negative in the case of intangible assets investment.

Similarly, we have introduced the percentage of shares that managers own as an explanatory variable (ALFA). In order to achieve a non-linear specification, beside this, we have introduced the squared ALFA variable (ALFASQ). When ownership structure is measured in terms of ALFA and ALFASQ (McConnell and Servaes, 1990), results remain basically unchanged. Perhaps the most outstanding feature is ALFASQ coefficient: it has the opposite sign to that of ALFA, although it is not significant.

Another alternative specification concerns the way of measuring firm value. In addition to financial q ratio, we have used the PER.¹⁶ This ratio has often been used in the literature as a way of incorporating the market perception about the firm ability to generate cash flows in the future (Smith and Watts, 1992; Lang and Stulz, 1994; Berger and Ofek, 1995). Accordingly, as long as PER increases, there will be a better market valuation about the firm ability to generate future cash flow relative to the present situation. The results are quite coherent, although some ownership structure variables appear as non-significant – especially for intangible investment –. In any case they maintain the expected signs.

As we previously exposed, we have also tested the suitability of control variables. In our opinion, LIQ could distort the results since, as it was defined, it might be a poor proxy for firm liquidity. This is why we have run the same regressions with the cash flow-to-total asset ratio instead of LIQ.¹⁷ The results, although less significant (especially for intangible assets investment), are basically consistent with previous ones.

The last alternative analysis has to do with the method of estimation. Whereas previous regressions were estimated by the method of two stages least squares, a three stages least squares estimation has been run. The results are again consistent with the proposed hypothesis and come to underline the mutual dependence among corporate value, investment and firm ownership structure. Therefore, our results do not seem to be contingent on the specification of the model, the definition of the variables or the method of estimation.

5. Concluding Remarks

The latest insights about firm nature whose common basis lies in the contractual theory and the informational friction stress the role played by ownership structure. Thus, firm ownership structure has become relevant in alleviating the conflicts of interest between managers and shareholders and as a result, in corporate value creation. In this benchmark, much of the attention has been paid to the proportion of shares owned by managers. In fact, an increase in managerial ownership can help to the alignment of the divergent interests of insider and outside shareholders (alignment hypothesis) and also to the strengthening in the power of managers to the detriment of outside shareholders (entrenchment hypothesis). The available evidence repeatedly shows a non-monotonic relationship between ownership structure and value creation: there is a positive relationship for low and very high levels of managerial ownership, whereas the relationship adopts a negative sign for intermediate levels of managerial ownership.

Notwithstanding, it has been proved that the link between ownership and corporate value is not so direct as might be expected. Furthermore, firm investment is a factor to be taken into account: at a first stage, investment seems to be affected by ownership structure while at a second stage corporate value can be considered an outcome of firm investment. In spite of this indirect causality, recent research has cast serious doubts on the direction of the causality. For this reason, in order to deal with the possible endogeneity of ownership structure, we aim to test the impact of investment and corporate value on ownership. This requires a widening of the framework by means of a model of simultaneous equations.

We have tested the preceding ideas for a sample of 140 Spanish listed companies for the 1991–1997 period and have found some significant evidence. Firstly, the estimation of one-equation models leads to conclusions quite consistent with previous research. We have found that managerial ownership has a non-monotonic influence on firm value, consistent with alignment and entrenchment hypotheses. In addition, we have observed that ownership structure affects firm value but the opposite relationship does not hold: corporate value has no influence on ownership structure. Another piece of evidence is that referring to investment: from our results it is followed that managerial ownership does not have a significant effect on firm investment.

However, certain doubts about the exogeneity of ownership structure support the need to analyze the interrelationships between corporate value, investment and ownership. This analysis has been carried out by the estimation of a system of simultaneous equations in which we have introduced the set of mutual relationships. The results confirm the intuition and highlight the influence of investment and corporate value on firm ownership. These results are robust to alternative specifications of ownership structure as well as to the variables included and the method of estimation. Nevertheless, they should be interpreted cautiously due to some shortcomings related to the q ratio. This ratio is grounded on the market

value and, therefore, it could proxy not only firm value creation but also firm's growth opportunities.

On balance, the simultaneous equations analysis seems to illustrate the inappropriateness of considering firm investment and corporate value as a response to ownership structure. Although managerial ownership usually determines both firm valuation and investment, it should be kept in mind explicitly that ownership structure may be as well an outcome both of investment and value. Consequently, it is not completely right to infer that ownership structure unidirectionally determines firm value; however, we should broaden the framework in order to consider explicitly the mutual links between firm value, investment and ownership. As a direction for future research, we might point at the extension of the analysis by incorporating some others issues such as debt and dividends in which previous literature has been involved. In fact, to a certain extent, some of these features have been introduced in our analysis.

Appendix

Variables glossary Abbreviations: equity market value (EMV); equity book value (EBV); total debt (D); total assets (TA); net income (NI); Property, plant and equipment (PPE); Intangible assets (IA); Depreciation (DP)

Abbreviation	Definition
LEV	D/EBV Total debt/Equity book value
ALFA	Directors' ownership participation (%) Directors' ownership participation (%)
INVP	$(PPE_t - PPE_{t-1} + DP)/TA$ PPE investment
INVIN	$(IA_t - IA_{t-1} + DP)/TA$ Intangible assets investment
LIQ	Short-term assets/TA Liquidity ratio
LOGAST	$LOG(Assets)$ Size proxy
Q	$(EMV+D)/(EBV+D)$ Financial q . Value creation
PER	EMV/NI Price-earning ratio. Firm valuation proxy

Acknowledgements

The authors are grateful for their comments to Beni Lauterbach, Matilde Fernández, Anna Grandori, Pedro Fuertes, two anonymous referees and the participants in the European Financial Management Conference held in Lugano and the V *Foro de Finanzas de Segovia*. All the remaining errors are our only responsibility. This research has received financial support from the Spanish *Dirección General de Enseñanza Superior e Investigación Científica* (proyecto PB97-0594).

Notes

¹ In the Spanish stock market there are a high number of quoted companies whose shares are traded only a few days every year and, hence, their value cannot be taken as significant. Additionally, ownership data disclosure is quite constrained since only a fraction of all the quoted companies report information about ownership structure. This is why, in spite of having market data for about 200 companies, only 140 were included in the sample.

² The original names of the databases are the *Registro de Empresas*, the *Registro de Participaciones Significativas en el Capital* and the *Estados Financieros Auditados*.

³ Whereas the market-oriented system includes U.K., U.S.A., Canada, Australia and some other countries, the main countries belonging to the bank-oriented system are Germany, France, Italy and Japan.

⁴ Bank for the Accounts of Companies Harmonized.

⁵ A more-in-depth explanation of the panel data methodology will be presented in the section 3.3.

⁶ Chung and Pruitt (1994) compare the financial q values with Tobin's q values of Lindenberger and Ross (1981). The results show that, at least a 96.6% of Tobin's q can be explained by financial q .

⁷ Instead of investment in intangible assets, we would have liked to work on R&D expenses. Unfortunately, companies do not report that information to the CNMV, so we have been forced to look for some proxies.

⁸ These levels of ownership might be considered too high compared to previous research. Notwithstanding, these breakpoints make sense because, as reported in Table II, Spanish corporate system is characterized by a highly concentrated ownership.

⁹ Although the breakpoints have not been selected on the basis of a grid search technique, the 50% breakpoint can be supported on the idea that it enhances the absolute control of the company whereas the 20% breakpoint is the round number closest to 19.42% (the mean managerial ownership level).

We should not forget that Morck et al. (1988) also use round numbers as breakpoints.

¹⁰ These industries are namely, Food and Beverage, Building, Property, Transportation and Communication, Electrical, Chemicals, Metal-mechanical, Mining, Textile and Paper, Automobile and Trade and Retailing.

¹¹ There are some other alternative procedures to control for the endogeneity. We have chosen this method to make easier the comparison of our results with Cho's (1998) one.

¹² We performed an additional regression in which insider's ownership was made to depend on firm investment. The results do not support any relationship between ownership structure and firm investment and have not been reported here for the sake of brevity. They are available upon request.

¹³ This assertion does not mean that the value and the investment of firms are completely independent. In fact, though not reported here, according to McConnell and Muscarella (1985), the correlation matrix shows a positive relationship between both variables.

¹⁴ There is also consistent evidence focused on Spanish market (Esteve and Tamarit, 1994; Espitia and Salas, 1986).

¹⁵ It is obvious that a third dummy variable for insider's ownership over 50% is not necessary. Furthermore, it would prevent the estimation due to multicollinearity problems.

¹⁶ See appendix for the description of the PER variable.

¹⁷ Let us remind the two ways to measure liquidity (stock and flow variables). Cash flow is a flow variable and, in turn, introduces another perspective about firm liquidity.

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