

Volume 37, Issue 4

The effect of ownership on firm value: a meta-analysis

Maurizio La Rocca

*Department of Business Administration and Law,
University of Calabria, Italy*

Tiziana La Rocca

Department of Economics, University of Messina, Italy

Fabiola Montalto

*Department of Business Administration and Law,
University of Calabria, Italy*

Raffaele Staglianò

*Montpellier Business School, Montpellier Research in
Management, Montpellier, France*

Abstract

This paper focuses on the controversial relationship between ownership and value with the aim of synthesizing the main empirical literature and highlighting the source of heterogeneity among the studies. Through the use of meta-analysis, there emerges a prevalent positive effect of ownership concentration on firm value, and a non-monotonic effect between managerial ownership and firm value. As the main output of the paper, the use of meta-regressions allowed the identification of the variables that moderate the relationship between ownership and value, detecting their potential function in explaining the reasons of controversial outcomes in previous studies. These latter results offer a number of suggestions for further research and, hopefully, ideas for actions to improve corporate governance in the interests of stakeholders.

This article is co-funded with support from the European Commission, European Social Fund and the Region of Calabria (Italy). The authors declare sole responsibility for this article and the European Commission and the Region of Calabria disclaim any responsibility for any use which may be made of the information contained in the same.

Citation: Maurizio La Rocca and Fabiola Montalto and Tiziana La Rocca and Raffaele Staglianò, (2017) "The effect of ownership on firm value: a meta-analysis", *Economics Bulletin*, Volume 37, Issue 4, pages 2324-2353

Contact: Maurizio La Rocca - m.larocca@unical.it, Fabiola Montalto - f.moltalto@unical.it, Tiziana La Rocca - tlarocca@unime.it, Raffaele Staglianò - r.stagliano@montpellier-bs.com

Submitted: June 06, 2017. **Published:** October 26, 2017.

1. Introduction

The recent financial crisis, together with cases of fraud and opportunism on the part of managers and entrepreneurs all over the world, has led to a widening of the debate on corporate governance. Phenomena such as integration of financial markets, globalization and hyper-competition in product markets have produced significant changes in economic and business activities. Thus, institutional mechanisms, as well as tools for self-regulation within companies, have proved to be inadequate in countering phenomena of deviance from the proper functioning of business processes and value creation.

The present study is part of this debate and focuses on one of the most important tools of corporate governance: firm ownership, particularly in terms of ownership concentration. The empirical evidence regarding the relationship between ownership concentration (blockholder ownership), and firm value is mixed, and provides very little in the way of consistent results (Agrawal and Knoeber 1996, De Miguel *et al.* 2004, Demsetz and Villalonga 2001, McConnell and Servaes 1990, Thomsen *et al.* 2006). Despite the wealth of research, the question remains whether large owners contribute to the solution of agency problems or whether they exacerbate them (Sánchez-Ballesta and García-Meca 2007). Despite the substantial empirical research undertaken in the ownership-firm performance link, the findings reported are characterized by fragmentation and diversity, thus limiting theory development in this field. For this reason, it is necessary to review, synthesize, and assess the relevant empirical research. Such an understanding is important because investigation efforts took place at different points in time, in varying geographical contexts, and with different terminologies, definitions, and operationalisations of variables.

The aim of this review is to use meta-analysis to investigate the role of ownership in the processes of firm governance and value creation. Ownership, in effect, is an instrument of great importance and interest which offers a contribution in mitigating problems of opportunism in business processes. We meta-analytically integrate empirical literature on the link between ownership and value in order to illustrate the current state of the art as far as this relationship is concerned, with attention to the potential non-linearity of this relation. In particular, as a main output of this review, the use of the statistical technique of meta-regression analysis enables us to explain variations among reported estimates and identify the main issues underlying the current debate, by verifying the role of external factors (moderators) in the relationship between block ownership and value and between managerial ownership and value. Meta-regression analysis is a technique which enables us to explain the contradictions that emerge in the literature. Our results support agency theory's proposed relationship between ownership and firm performance, and in addition they offer a number of directions for further research on this subject and, hopefully,

suggestions for actions to improve corporate governance in the interest of stakeholders.

The meta-analysis results confirm a robust, economically important, positive effect of ownership on firm value, that can assume non-linear direction with regard to managerial ownership, showing that this effect is significantly affected by moderator factors.

The paper is structured as follows. The second section covers the concepts of ownership concentration and managerial ownership and the theories on their possible effects on value. The third section refers to the selection criteria of the sample. The fourth section introduces the quantitative analysis of literature review (meta-analysis), while the fifth section presents the model and the results of the moderation effects (meta-regression). The work ends with some concluding remarks, highlighting possible managerial implications and future research directions.

2. The relationship between ownership and firm value

Corporate governance is a broad and complex concept, economically very important but not easy to define, because of the multiple dimensions that characterize its domain (Becht *et al.* 2003, Lazzari 2001, Zingales 1998). Adopting a managerial perspective (internal to the firm), corporate governance relates to the allocation of the decision-making system, designed to overcome the incompleteness of contracts between stakeholders (Lazzari 2001, Zingales 1998). One of the most studied mechanisms of corporate governance is ownership (Denis 2001, Shleifer and Vishny 1997), which carries out an important role in aligning the interests of owners and managers or between large and small shareholders. Specifically, this paper uses the meta-analysis approach to investigate the role of ownership, in terms of ownership concentration and managerial ownership, highlighting their effect on value creation processes¹.

The term ownership concentration is usually related to the blockholders who, according to a definition commonly accepted by the business community, in line with the U.S. Securities Exchange Commission, represent those shareholders holding at least 5% of the equity (Denis 2001, Seifert *et al.* 2005). Within a broader definition, however, ownership concentration would be any stake able to influence and control business activity².

The other important dimension of ownership is managerial ownership, used to align the interests of the decision-maker with those of risk-bearing entities (Fama and Jensen 1983). This is

¹ Ownership concentration and managerial ownership are the main dimensions with respect to which the managerial and financial literature discusses the link ownership-value.

² Often, blockholders are institutional investors, at least in common law countries. For example, if a mutual fund owns 10 million shares in a firm, or 10% of ownership, it will be a blockholder and it will have a significant influence on management. It could also happen that a large shareholder has an active role in managing the firm, qualifying himself as a manager. In this case, the figure of the professional manager would be merged with that of blockholder. Demsetz and Villalonga (2001) observe a positive correlation between the proportion of capital held by family shareholders and the fraction owned by managers. This possibility should focus on SMEs and family firms, in which the owner is also the person who manages the firm.

one of the main tools of managerial reward, along with bonuses and stock options, of particular interest as it can promote, through risk-sharing, the efficient conduct of the manager without causing immediate cash outflows for the firm (Barney 1991). In other words, it seeks to reduce the conflict of interest between management and ownership through the allocation of shares to management and the consequent sharing of business risk. The analysis of the involvement of management in corporate ownership, as an instrument of governance, has its antecedents in the fundamental contribution of Jensen and Meckling (1976). The authors suggest the need for the development of a system of incentives and controls based on ownership designed to prevent opportunistic behavior. Changes in equity stakes, affecting the intensity with which the problems of firms are felt, shape the efficiency of firm governance and performance³.

In the analysis of the relationship between ownership concentration and value it is possible to identify three main perspectives of study. Although some scholars find a non-significant relationship (Demsetz 1983, Demsetz and Lehn 1985)⁴ or that it is not detectable (Prowse 1992), the major contributions have shown, alternately, that this relationship may be positive (monitoring hypothesis), negative (entrenchment hypothesis) or may have a non-monotonic trend (combining monitoring and entrenchment hypothesis).

The first theoretical perspective is reflected in the context of large American corporations (Berle and Means 1932), in which conflicts of interest between the manager and a multitude of small shareholders, accompanied by a lack of control over the management, could give rise to opportunistic behavior. In this context, ownership concentration, and therefore the presence of a single or a few large shareholders, may be a valuable tool for limiting problems related to abuse of managerial discretion, through the so-called monitoring effect. In fact, a large shareholder may have a large enough stake that it pays for him to do some monitoring of the incumbent management, as the large shareholder's return on his own shares suffices to cover his monitoring. Holderness and Sheehan (1985) discuss the hypothesis, that is consistent with their evidence, for which large investors improve the management of firms. Agrawal and Mandelker (1990), Barclay and Holderness (1991) Bethel *et al.* (1998), and Shleifer and Vishny (1986), show that the existence of

³ The two authors have demonstrated the presence of significant conflicts of interest for managers in possession of equity less than 100%. In effect, managers and owners, having different utility functions to maximize, as soon as possible, show a natural tendency toward opportunistic behavior, which reduces the overall firm value in favor of additional benefits for a single subject. The higher level of equity participation of managers, transforming them into risk-bearing subjects, shows a relationship of proportionality between the percentage of shares held by managers, the intensity with which firm will experience problems and needs, and commitment in governance. Managerial ownership, therefore, by involving managers in share capital, promotes firm efficiency, encouraging investments in specific skills and abilities specific to the assets in place of the firm, directing them towards the creation of growth opportunities and, therefore, economic value.

⁴ This is an endogenous choice. The determinants of ownership concentration are firm size (the greater the firm, the greater is the degree of ownership dispersion), control potential (instability of a firm's operating environment indicates more control potential implying higher ownership concentration), regulation aspects and amenity potential.

blockholders, controlling the management, leads to better performance.

The second theoretical perspective supports the view that blockholders, as controlling shareholders, would adopt opportunistic behavior against the expropriation of minority shareholders to their advantage by exploiting the power of control over monetary and non-monetary benefits (Denis and McConnell 2005), through the entrenchment effect. Cronqvist and Nilsson (2003), Leech and Leahy (1991), and Thomsen *et al.* (2006) emphasized that an increased ownership concentration is associated with a reduction in value.

The third perspective combines the monitoring effect and the entrenchment effect, arguing that the predominant effect depends on the level of ownership concentration, and then the theory considers that monitoring and expropriation effects exist depending on the level of ownership concentration, for which reason firm value will be non-linearly related to ownership concentration (De Miguel *et al.* 2004, Gedajlovic and Shapiro 1998, Slovin and Sushko 1993).

With regard also to the link between managerial ownership and value, it is possible to identify three main theoretical perspectives related to the work of Jensen and Meckling (1976), Mork *et al.* (1988), and Stulz (1988) in addition to those which find that there is no relationship (Demsetz 1983). There is evidence of a possible positive relationship (alignment effect⁵), negative relationship (entrenchment effect⁶) and a non-monotonic relationship, approximated to a quadratic or cubic function.

According to the alignment effect (Jensen and Meckling 1976), managerial ownership is an instrument of convergence of interest between risk-bearing and decision-making subjects, i.e. between ownership and management, since as management's equity ownership increases, their interests are likely to coincide more closely with those of outside shareholders. Agrawal and Mandelker (1987) and Cho (1998) show that the commitment of managers to creating value is directly proportional to the shares of stock owned.

According to the entrenchment effect (Stulz 1988), there would be costs that outweigh the benefits associated with managerial ownership, arising from expropriation mechanisms put in place by managers who focus their business strategies not necessarily benefiting the firm. As highlighted in the literature (Fama and Jensen 1983, Jensen and Murphy 1990, Shleifer and Vishny 1989, Stulz

⁵ In order to mitigate agency problems, Jensen and Meckling (1976) consider necessary to make the manager share the business risk, assuming a positive and growing relationship between managerial ownership and firm value. The greater participation in share capital enhances performance because it allows alignment of economic interests between managers and shareholders (convergence of interests between ownership and management).

⁶ Managers in possession of larger stake can make opportunistic management decisions, expropriating value to the detriment of minority shareholders and creditors. Their behavior may be oriented towards activities of maximizing market share, development of firm size and technology leadership, reducing the focus on efficient resource allocation and maximization of value, thereby reducing attention paid to the interests of other stakeholders (Morck *et al.* 1988). In other words, high managerial ownership undermines the control of majority shareholders and, consequently, increases the likelihood that managers adopt inefficient choices and are not oriented towards the creation of value. For a definition of entrenchment, see the contribution of Shleifer and Vishny (1989).

1988), when the level of managerial ownership raises, managerial discretion in undertaking opportunistic behavior increases, rejecting attempts of hostile takeover, even in the presence of inefficient allocation of control⁷. In fact, managers can entrench themselves by making manager-specific investments that make it costly for shareholders to replace them; in this way managers can reduce the probability of being replaced and obtain more latitude in determining corporate strategy.

The third theoretical approach, obtained by combining the alignment effect and the entrenchment effect, notes the existence of a non-monotonic relationship between managerial ownership and value. The effect of managerial ownership on value would depend on the level of managerial participation in equity. Managers would respond to two opposing forces and the relation between ownership and value may depend on which force dominates over any particular range of managerial equity ownership. The opposing forces would work in the following way: managers' natural tendency is to allocate the firm's resources in their own best interests, which may conflict with the interests of outside shareholder, but as management's equity ownership increases, their interests are likely to coincide more closely with those of outside shareholders. The first of these forces has a negative effect on the value of the firm, whereas, the second has a positive effect. It might be not possible, a priori, to predict which force will dominate at any level of managerial equity ownership. Himmelberg *et al.* (1999) and McConnell and Servaes (1990) support the existence of a relationship approximated to a parabola: for low levels of managerial ownership, there is a positive link, while this relationship becomes negative for high levels of managerial ownership. In contrast, Cui and Mak (2002), as well as De Miguel *et al.* (2004), Griffith (1999), and Morck *et al.* (1988) have supported the presence of an approximately cubic relationship which first has increasing, then decreasing, and, finally again, increasing trend.

2.1 Main research hypotheses

Previous empirical studies regarding the link between ownership and value, showing mixed results, have failed to settle disputes on this issue (Demsetz and Villalonga 2001, Denis 2001). The difficulties in interpreting the link between ownership and value may derive from several factors acting upon it.

Regarding ownership concentration, since the dispersion of ownership creates problems of free riding and makes it difficult to control the manager, a positive relationship is assumed between ownership concentration and firm performance (monitoring hypothesis). However, that relationship may not be monotonic for high levels of ownership concentration. In such situations, the so called

⁷ Stulz (1988) assumes the validity of a takeover model in which, starting from a low level of ownership concentration, the control premium, which must be paid to take command of a firm, will rise with the increase of shares held by management.

expropriation hypothesis may become relevant, with the emergence of conflicts of interest and expropriation of wealth between controlling shareholders and minority shareholders, rather than between managers and shareholders (Shleifer and Vishny 1997). This hypothesis suggests the possibility of a non-linear relationship between ownership concentration and value. Therefore, this analysis aims to test the H1 hypothesis, concerning the relevance of a quadratic relationship between ownership concentration and value.

H1: The relation between ownership concentration and value is not-monotonic, so non-linear models have an important moderating role.

Considering managerial ownership, since the contribution of Jensen and Meckling (1976), a positive value is assumed on account of the participation of managers in equity (convergence of interests hypothesis). The value of the firm increases as a result of an increase in managerial ownership. However, as pointed out by Fama and Jensen (1983), high managerial ownership has costs. When a manager owns a substantial fraction of corporate shares, which gives power of influence and control, he may adopt opportunistic behaviors that depress the value of the firm (entrenchment hypothesis). Theoretical arguments alone cannot unambiguously predict the relationship between management ownership and market valuation of the firm's assets. While the convergence-of-interests hypothesis suggests a uniformly positive relationship, the entrenchment hypothesis suggests that market valuation can be adversely affected for some range of high ownership stakes. Several managerial ownership studies identify a non-linear relationship, although there is disagreement on the functional form of this connection (Morck *et al.* 1988). Therefore, through the H2 hypothesis, we intend to verify the relevance of a nonlinear relationship between managerial ownership and value.

H2: The relation between managerial ownership and value is not-monotonic, and so non-linear models have an important moderating role.

2.2 Firm-level and paper-specific moderating effects

Not all firms are equal. Differences in organizational forms or listing status measure in terms of a different sensitivity to asymmetric information and opportunism. Previous studies examine corporate governance differences of listed and unlisted firms (i.e., Loderer and Waelchli 2010). Large listed firms have, generally, a dispersed ownership, potentially facing problems concerning the separation between ownership and control. In listed firms, the role of capital markets and

transparency requirements, backed up by entities outside control (i.e., SEC in USA, Consob in Italy), provides additional managerial control. By contrast, unlisted firms have highly concentrated ownership, often with a large shareholder typically controlling the majority of the votes, and a business model that does not depend on the capital markets. In our setting, it is particularly useful to recall the agency problem that concerns the potential conflicts of interest between owners and non-owners, such as stockholders vs. managers. This specific type of agency problem produces the more serious cost in listed firms, respect to the unlisted (Faccio *et al.* 2001, La Porta *et al.* 2000, Villalonga and Amit 2006). For this reason, the monitoring and incentive problem between owners and managers are major in listed firms, so we expect that status of listed company reinforce the relationship between ownership concentration and performance. In addition, owners are more at the mercy of managers in listed firms, but this effect may be reduced aligning managers' behavior with that of shareholders, by having managers increase their ownership in the companies; so we expect that status of listed company reinforce the relationship between managerial ownership and performance. For this reason, the listing status may moderate the relationship between ownership and value, and H3 hypothesis has to be tested.

H3: The intensity of the relationship between ownership and value is different for listed and unlisted firms. In particular, the relationship between ownership concentration and firm value is stronger in listed firms than in unlisted firms.

According to some scholars (Demsetz and Villalonga 2001, Himmelberg *et al.* 1999) contradictions in the relationship between ownership and value arise from the complexity of the econometric analysis. In effect, there would appear to be serious problems of endogeneity between the two variables⁸. The term endogeneity means that there is reciprocal causation or the presence of covariation in the absence of causation (i.e. the covariation between ownership and value would appear to be caused by one or more additional variables, which act randomly on both ownership and value). Börsch-Supan, and Köke (2002) address the problem stating that ownership structure is co-determined with the firm performance, and without structural assumptions, the impact of this corporate governance mechanism on performance cannot be identified, because of the problem of reverse causality.

In symbols, assume that the model can be written as: $Value = \beta * Ownership + \varepsilon$, and $Ownership = \gamma * Value + \eta$, where $E(\varepsilon) = E(\eta) = 0$. If the first equation is estimated by OLS, we obtain: $\beta^*(estimated) = \beta + cov(Ownership, \varepsilon)/Var(Ownership)$. With simple mathematical manipulations

⁸ In presence of endogeneity, advantages and disadvantages of different level of ownership could compensate each other and/or change, altering the effect of ownership on value empirically measured.

we can see that: $\text{cov}(\text{Ownership}, \varepsilon) = [\gamma \cdot \text{var}(\varepsilon) + \text{cov}(\varepsilon, \eta)] / (1 - \beta\gamma)$. For example, in the case of the ownership concentration, we can suppose that negative performance leads to a takeover which results in higher shareholder concentration, and that the new owners replace management which in turn leads to improved performance. According to these assumptions, β is positive and γ negative. If ε and η are not correlated, we know that the covariance of *Ownership* and ε is positive. This implies that the impact of shareholder concentration on performance is overestimated because OLS does not consider the endogeneity of shareholder concentration. Hence, performance is a function of endogenously related ownership variables, and a simple OLS regression may overestimate their explanatory roles (Hamilton and Nickerson 2003). Also Agrawal and Knoeber (1996) find evidence of significant influence of ownership structure on firm value, but this influence becomes less important when controlling for endogeneity in ownership using 2SLS. Therefore, given the complexity of the relationship, more sophisticated and advanced econometric techniques have been used (2SLS/3SLS or GMM), able to capture the multidimensionality of the phenomenon observed and to control problems of endogeneity, as compared to traditional models (OLS). Therefore, in order to verify the significance of endogeneity problems, we test the H4 hypothesis.

H4: The use of econometric techniques able to control for problems of endogeneity moderates the relationship between ownership and value.

An additional factor of heterogeneity among the studies regarding the link between ownership and value derives from the type of measure of value used as the dependent variable. Studies mainly use accounting-based or market-based measures. The former are mainly criticized as being subject to manipulation and fiscal policies by managers, approximating only the component of the firm value relative to assets in place, and ignoring the growth opportunities. The second, however, are typical forward-looking measures, which attempt to approximate the role of growth opportunities, although they are criticized as much influenced by factors outside of management control. The use of different measures of variables may be an important source of variation in empirical findings. In fact, it has been argued that different measures of firm performance may have an influence on ownership-performance relation (Rhoades *et al.* 2001). It is possible that the use of accounting-based performance measures, not approximating the effects of ownership on the growth opportunities, leads to an underestimation of the relationship under study. Therefore, as suggested by Sánchez-Ballesta and García-Meca (2007), we intend to verify whether the controversial results between the variables under study are related to the nature of the proxy for value used.

H5: The use of accounting-based performance measures moderates the effect of ownership on value.

2.3 Institutional-level moderating effects

Changes in the sign or in the intensity of the relationship can be due to general trend and adjustment along the years with regards to corporate reforms, new technologies and more database about firms available. Changes in relationships over time may depend on the introduction of reforms in company law or the financial market or improvements in the institutional context. Cho and Kim (2007), for example, dealing with Korean companies, state that the agency costs are instigated by large shareholders desiring to dilute the wealth of minority shareholders, and, as such, governance reform in Korea, including the introduction of outside directors, has been aimed at decreasing the agency costs stemming from these large shareholders, so influencing the effects of large shareholders on performance. As with any economic analysis, a question can also arise as to whether the results for one time period are representative of those that would occur in a later or earlier time period (McConnell *et al.* 2008). In particular, the use of reliable data to support results is essential, so the time period of the analysis can be a proxy of the growing availability of dataset concerning firms that over time also becomes higher in quality. From previous meta-analyses, even on different issues, it is found that higher quality studies produced a quantitatively larger effect size and a greater level of significance than lower quality studies, and such differences in study results may be explained by differences in time-period of the analyses. Therefore, to verify if greater availability and quality of data, linked to the period of analysis of which each single paper is based on, positively moderate the relationship between ownership and value, we examine, through the H6 hypothesis, the effect of the time, able to capture all types of changes mentioned above, making it possible to better measure the shape of the relationship.

H6: The time period of analysis moderates the relationship between ownership concentration and value.

Moreover, some studies have noted the role of country-specific factors that would act on the relationship analyzed. These factors could play a decisive role with respect to the efficacy of ownership as a corporate governance mechanism. De Miguel *et al.* (2003) show that ownership concentration and managerial ownership are influenced by the level of investor protection, the degree of financial market development⁹, the role of the market for corporate control and, in

⁹ An efficient financial system facilitates access to external sources of capital, leading to low levels of ownership

general, by other external factors of governance, while La Porta *et al.* (1999) detect changes in the degree of cross-country ownership concentration as well as in the level of managerial involvement. In particular, according to Shleifer and Vishny (1997), the choice of the degree of ownership concentration is a function of the effectiveness of a given country's legal and enforcement system. The lack of protection of small shareholders, in the presence of asymmetric information and incomplete contracts, would lead to ownership concentration as a viable mechanism to mitigate agency problems. Under this view shareholder lawsuits and blockholder monitoring are substitutes: when shareholders have few rights to sue managers, the value of a blockholder who can monitor managers increases and so does ownership concentration. So we expect that the relationship between ownership concentration and value is strongest where there is a lack of legislation, because of a greater monitoring effect. On the other hand, the insiders can appropriate corporate resources, and under this view, the frequency of insiders increases as legal constraints decline because it becomes easier for them to appropriate corporate resources. That is, in this case we expect a strengthening of the relationship between managerial ownership and value, but for the opposite reasons, linked to the expropriation of investors (Holderness 2009). Despite the fact that there has been some recognition that the ownership-firm value relationship may not be valid in the same way in all national contexts (Gedajlovic and Shapiro 1998), there is little empirical evidence regarding the effect of national differences in ownership structure on firm performance. The legal systems and investor protection, are likely to influence the relationship between ownership structure and firm performance. There are striking differences between countries' corporate governance systems due to a number of features, including laws, taxes, capital market characteristics, culture, history, and industrial organization, and, above all, shareholder protection. One way to address this concern, suggested by La Porta *et al.* (1998), is to classify countries in terms of legal origin, which is strongly correlated with shareholder protection¹⁰. In particular, the common law countries tend to have better protection of minority shareholders in comparison to civil law countries. Therefore, we intend to verify in which legal system the mechanisms such as ownership concentration and managerial ownership are more effective.

H7: The institutional system moderates the relationship between ownership and firm value.

concentration (De Miguel *et al.* 2003).

¹⁰ In common law countries the role of the financial market is predominant, exerting a discipline on managers (market for corporate control). At the same time, property is typically contestable. In contrast, civil law contexts are characterized by the significant role of financial intermediaries and low contestability of stocks. These differences are discussed by La Porta *et al.* (1999).

3. Sample of studies

In an effort to resolve the doubts about the link between ownership and value, this research aims to use the tool of meta-analysis¹¹. This is a technique of quantitative review of the empirical literature that aggregates, compares and synthesizes the results of different empirical studies, translating them into a common metric. The objective of the meta-analysis is the integration of knowledge on a particular relationship through the analysis and the combination of empirical results from studies on the subject, amplifying the explanatory power and the possibility of generalizations (Hunter and Schmidt 1990, Glass 1976)¹². Compared to the narrative literature reviews¹³, meta-analysis provides a rigorous methodological approach, together with statistical soundness, to examine the results of the literature regarding a specific topic.

For this reason, we point out the search criteria and the selection of the papers. Then a preliminary narrative review of the empirical literature is designed to offer an overview of the topic. A quantitative review follows, with the aim of obtaining a result that summarizes the controversial empirical results using a single quantitative index, more significant than the results found by observing every single study, called *effect size*¹⁴.

To implement the meta-analysis on the relationship between ownership and value, it is necessary to identify and select the studies of interest. To identify the population of studies that report on the relationship between ownership concentration and firm performance, we used a set of complementary search strategies, through which we systematically explored both published and unpublished sources, in order to improve the scope and validity of a meta-analysis. We have used some of the most important search engines for academic study including: ScienceDirect, JSTOR, Ideas, Ingenta, Blackwell, EBSCO, Emerald, and Elsevier. Using SSRN, it has also been possible to obtain working papers¹⁵. We have also observed the quotes in the papers identified. As search criteria we have used keywords such as: corporate governance, ownership structure, ownership

¹¹ For a theoretical and practical extension of the subsequent arguments, we recommend consultation some manuals including Glass *et al.* (1981), Kulinskaya *et al.* (2008), Hedges (1992), as well as some contributions and research papers (Stanley and Jarrell 1989).

¹² In particular, according to Glass (1976): “Meta-analysis refers to the analysis of analyses . . . the statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating the findings. It connotes a rigorous alternative to the casual, narrative discussions of research studies which typify our attempts to make sense of the rapidly expanding research literature”.

¹³ The narrative literature reviews can be misleading, because different researchers may reach different conclusions on a series of studies, due to changes in characteristics such as sample size, methodology, time period, etc. (Hunter and Schmidt, 1990).

¹⁴ This is simply the degree to which a given phenomenon is present in the population (Cohen 1977).

¹⁵ We have consulted some of the most important journals of Management and Finance, including, among others: Academy of Management Journal, European Finance Review, European Finance Management, European Journal of Finance, Journal of Management Studies, Journal of Accounting and Economics, Journal of Business, Journal of Business Finance and Accounting, Journal of Finance, Strategic Management Journal, Journal of Financial Economics, Review of Financial Studies, Financial Management, Organization Science, Corporate Governance: an International Review, Management Science, and the Journal of Financial and Quantitative Analysis.

concentration, managerial ownership, performance and value. The research has been defined by reference to the JEL classification codes “G32” and “G34”. These criteria led to the selection of 38 articles dating from 1983 to 2008¹⁶. The articles considered cover large regions of the world. In particular, the regions of the world considered are as follows: Canada, France, Germany, US, UK (1 paper); China (2 papers); European Union (2 paper); Germany (3 papers); Germany, Japan, US, UK (1 paper); Australia (1 paper); Hungary (1 paper); Italy (2 paper); Japan (2 paper); Korea (1 paper); New Zealand (1 papers); Norway (1 paper); Spain (1 paper); Switzerland (1 paper); Taiwan (1 paper); UK (2 papers); US (13 papers); Western Europe (1 paper); World countries (1 paper). We have excluded from the meta-analysis the works in which: 1) managerial ownership and ownership concentration have been expressed in terms of dummy (i.e. dichotomous variables); 2) measures of ownership exclusively expressed by levels (the so-called piecewise regressions); 3) only the Beta of the regression has been present, with no additional information on the t-student, the p-value or the standard error.

Looking at Table 1, it is possible to identify certain characteristics that distinguish the paper selected, taking into account that there are some studies that may fall into several categories. These characteristics, considered as possible factors that moderate the relationship between ownership and value, may be the cause of the controversial empirical evidence.

As a proxy of firm value, most of the papers have used market-based indicators, although many studies have also used accounting-based measures. Differences in the use of these variables could be due to differences in empirical evidences. With reference to ownership variables, there are not any particular problems in the indicators used. Mainly, ownership concentration has been measured with the percentage of shares held by the largest shareholder. In two articles (Chen *et al.* 2006, Short and Keasey 1999) the figure of the large shareholder is overlapped with that of the institutional investor. In two other papers the majority of shares is in the hands of the State (Wei and Varela, 2003) or owned by family groups (Andres 2008). Managerial ownership has been measured by considering the shares held by Insiders, Management, CEO, Officer, Director and Board members.

¹⁶The first year of the analysis coincides with the work of Demsetz and Lehn (1983) from which the interest in the issues concerning the ownership originated.

Table 1 . Specificity of selected studies.

Characteristics of papers	Authors
Analyses in common law contexts	Yermack (1996); Agrawal and Knoeber (1996); Loderer and Martin (1997); Cho (1998); Gedajlovic and Shapiro (1998); Griffith (1999); Short and Keasey (1999); Himmelberg <i>et al.</i> (1999); Demsetz and Villalonga (2001); Palia (2001); Cui and Mak (2002); Callahan <i>et al.</i> (2003); Seifert <i>et al.</i> (2005); Davies <i>et al.</i> (2005); Thomsen <i>et al.</i> (2006); Adams and Santos (2006); Fich and Shivdsani (2006); Bhabra (2007)
Analyses in civil law contexts	Gedajlovic and Shapiro (1998); Lehmann and Weigand (2000); Morck <i>et al.</i> (2000); Thomsen and Pedersen (2000); Randoy and Goel (2003); Hovey <i>et al.</i> (2003); Joh (2003); Wei and Varela (2003); De Miguel <i>et al.</i> (2004); Seifert <i>et al.</i> (2005); Earle <i>et al.</i> (2005); Yeh (2005); Boubraki <i>et al.</i> (2005); Thomsen <i>et al.</i> (2006); Chen <i>et al.</i> (2006); Beiner <i>et al.</i> (2006); Maury (2006); Kaserer and Moldenhauer (2008); Perrini <i>et al.</i> (2007); Perrini <i>et al.</i> (2008); Andres (2008)
Listed companies	Agrawal and Knoeber (1996); Yermack (1996); Loderer and Martin (1997); Cho (1998); Gedajlovic and Shapiro (1998); Griffith (1999); Himmelberg <i>et al.</i> (1999); Short and Keasey (1999); Morck <i>et al.</i> (2000); Lehman and Weigand (2000); Thomsen and Pedersen (2000); Palia (2001); Demsetz and Villalonga (2001); Cui and Mak (2002); Wei and Varela (2003); Callahan <i>et al.</i> (2003); Joh (2003); Hovey <i>et al.</i> (2003); Randoy and Goel (2003); De Miguel <i>et al.</i> (2004); Earle <i>et al.</i> (2005); Yeh (2005); Beiner <i>et al.</i> (2006); Adams and Santos (2006); Chen <i>et al.</i> (2006); Fich and Shivdsani (2006); Kaserer and Moldenhauer (2008); Bhabra (2007); Andres (2008)
Unlisted companies	Boubraki <i>et al.</i> (2005); Davies <i>et al.</i> (2005); Seifert <i>et al.</i> (2005); Maury (2006); Thomsen <i>et al.</i> (2006)
Studies that have monitored problems of endogeneity	Agrawal and Knoeber (1996); Demsetz and Villalonga (2001); De Miguel <i>et al.</i> (2004); Davies <i>et al.</i> (2005); Seifert <i>et al.</i> (2005); Beiner <i>et al.</i> (2006); Perrini <i>et al.</i> (2007); Perrini <i>et al.</i> (2008); Loderer and Martin (1997); Cho (1998); Himmelberg <i>et al.</i> (1999); Lehmann and Weigand (2000); Palia (2001); Boubraki <i>et al.</i> (2005); Thomsen <i>et al.</i> (2006); Chen <i>et al.</i> (2006); Bhabra (2007)
Studies that have not monitored problems of endogeneity	Griffith (1999); Yermack (1996); Short and Keasey (1999); Thomsen and Pedersen (2000); Morck <i>et al.</i> (2000); Wei and Varela (2003); Randoy and Goel (2003); Maury (2006); Kaserer and Moldenhauer (2008); Gedajlovic and Shapiro (1998); Farrer and Ramsay (1998); Callahan <i>et al.</i> (2003); Joh (2003); Hovey <i>et al.</i> (2003); Yeh (2005); Adams and Santos (2006); Earle <i>et al.</i> (2005); Cui and Mak (2002); Fich and Shivdsani (2006)
Market based measures (Tobin's Q/ Market-to-Book-ratio, ecc.)	Agrawal and Knoeber (1996); Yermack (1996); Loderer and Martin (1997); Cho (1998); Short and Keasey (1999); Griffith (1999); Himmelberg <i>et al.</i> (1999); Morck <i>et al.</i> (2000); Palia (2001); Demsetz and Villalonga (2001); Cui and Mak (2002); Wei and Varela (2003); Callahan <i>et al.</i> (2003); Hovey <i>et al.</i> (2003); Randoy and Goel (2003); De Miguel <i>et al.</i> (2004); Davies <i>et al.</i> (2005); Seifert <i>et al.</i> (2005); Maury (2006); Thomsen <i>et al.</i> (2006); Beiner <i>et al.</i> (2006); Adams and Santos (2006); Chen <i>et al.</i> (2006); Perrini <i>et al.</i> (2008); Andres (2008); Bhabra (2007); Thomsen and Pedersen (2000); Yeh (2005); Fich and Shivdsani (2006); Kaserer and Moldenhauer (2008); Perrini <i>et al.</i> (2007)
Accounting based measures (Roa, Ros, etc.)	Short and Keasey (1999); Thomsen and Pedersen (2000); Cui and Mak (2002); Joh (2003); Randoy and Goel (2003); Boubraki <i>et al.</i> (2005); Earle <i>et al.</i> (2005); Maury (2006); Adams and Santos (2006); Fich and Shivdsani (2006); Kaserer and Moldenhauer (2008); Andres (2008); Gedajlovic and Shapiro (1998)

There are other factors that distinguish the selected articles. It is possible to distinguish between the analysis based on common law or civil law contexts, which differ in terms of legal system and enforcement, i.e. the degree of protection accorded to investors and the ability to penalize those who adopt opportunistic behavior. Legal and governance models are closely related and therefore potentially able to alter the relationship between ownership and value. The selected articles are divided equally between civil law and common law contexts. Another taxonomy shows that the majority of the articles is based on listed firms, which are characterized, as opposed to non-listed firms, as being less sensitive to problems of asymmetric information and transaction costs as well as for greater managerial control by the market. Finally, we note that the papers that control for endogeneity problems are similar in number compared to the contributions that use simple econometric techniques that do not consider this issue.

The conflicting conclusions reached at the end of this qualitative analysis justify the use of meta-analysis to identify the minimum common denominator that will help to explain the sources of the observed heterogeneity, offering new ideas and hypotheses to test in further research.

4. Quantitative analysis of the relationship ownership-value: determination of the effect size

The quantitative analysis of selected papers aims at standardizing the results of numerous studies, arriving at a synthesis of the current state of the art regarding a given topic. In particular, the first output of the meta-analysis is the calculation of effect size, which measures the sign and intensity (magnitude) of the relationship between two variables. Although there are many metrics that are often used to determine it (risk rates, risk difference, odds ratios, Cohen's d), when the analysis is based on continuous variables, the correlation coefficient, Pearson's r , is the one most suitable for use. From a methodological point of view, applying the fixed effect method¹⁷, it is necessary to calculate the effect size for each study, through a process of conversion into a common metric, combining, finally, all the values in order to obtain an average effect size.

Since regressions are applied in the studies selected, it is necessary, for determining effect size, to transform the beta coefficient into the correlation coefficient of Pearson's r . In addition, the correlation coefficient obtained must be transformed into a common metric by converting the corresponding Fischer Zr -score, which is a weighted average effect size, reducing any distortions arising from differences in the various studies and making the values comparable between studies. To calculate a mean effect size, the different studies are weighed by the inverse of the variance for each value (square of the standard error). Therefore, in order to summarize the relationship between the variables under study it is necessary to observe the average Zr -score weighted by the inverse of the variance.

Referring to the relationship between ownership and value, the effect size estimation must take into account the distinction between linear and nonlinear relationship. In other words, we consider the effect size of the linear effect of the link between ownership and value. This approach, different from similar works (Sánchez-Ballesta and García-Meca 2007)¹⁸, has the advantage of

¹⁷ It is possible to use two types of econometric model for the application of meta-analysis: fixed effect model and random effect model (Hedges 1992). The fixed effect model assumes that the effect size is unique for all observations included in the meta-analysis, while the random effect model assumes that the effect size observed in the population varies from study to study. It is assumed in that circumstance that every single study, and therefore, each population, has a different effect size. There is no single "true" value but a distribution of values. It also assumes that the differences in the results drawn from each study are both random and due to differences between populations or related to the characteristics of the individual studies. The choice of model depends on the inference that the researcher wishes to make. The fixed effect model is appropriate for a conditional inference, that is, an inference that can be extended only to studies included in the meta-analysis. In contrast, the random effect model facilitates unconditional inference, and the aim of the generalization of results, in this case, is beyond the studies included in the meta-analysis or rather, the interest is not confined only to research in the meta-analysis ; the latter are, in fact, a sample from a larger population of possible studies.

¹⁸ According to Sánchez-Ballesta and García-Meca (2007) the solution of incorporating into a single linear analysis both the "pure" evidence and that arising from the non-linear models would confuse the significance of the linear term. In any case, doubts about possible distortions in the calculation of effect size by Sánchez-Ballesta and García-Meca (2007) do not find support. The significance and the explanatory power of the linear coefficient is not influenced by observing the linear term in nonlinear models or directly the linear term in the "pure" linear models. This is true both with respect to ownership concentration and to managerial ownership. Both signs of the Zr -Score and standard deviations show no alteration of the final results from the comparison of the two theses.

being able to appreciate how the inclusion of non-linear terms modifies the relationship between ownership and value through the following meta-regressions. We calculated the effect size of the linear relationship between ownership and value considering those studies that assume the existence of a linear relationship and, subsequently, engaging the linear variable in studies that have assumed a not monotonic relationship. Next, we calculated the effect size of the linear and nonlinear term studies of those which have tested only non-linear relationships.

Table 2, with reference to the influence of ownership concentration on value, shows the effect size results by using different weights, while, in a similar vein, Table 3 shows the results concerning the effect of managerial ownership on value.

Table 2. Descriptive statistics on the relationship between ownership concentration and value.

Investigated relationship		Average Zr, weighted with the inverse of the variance	Range	Number of studies	Test Q (p-value)
Linear effect (only for linear models)		0,037 (0,119)	[-0,279; 0,232]	70	0,000
Linear effect (from linear and quadratic models)		0,037 (0,115)	[-0,279; 0,232]	82	0,000
Studies in which there is a quadratic relationship	Linear term (OWN CONC \rightarrow W)	0,119 (0,138)	[-0,116; 0,135]	12	0,000
	Quadratic term (OWN CONC \rightarrow W)	-0,106 (0,131)	[-0,111; 0,116]	12	0,000

Notes: standard deviation in brackets

Table 3. Descriptive statistics on the relationship between managerial ownership and value.

Investigated relationship		Average Zr, weighted with the inverse of the variance	Range	Number of studies	Test Q (p-value)
Linear effect (only for linear models)		0,168 (0,168)	[-0,338; 0,458]	49	0,000
Linear effect (from linear, quadratic and cubic models)		0,162 (0,163)	[-0,338; 0,458]	95	0,000
Studies in which there is a quadratic relationship	Linear term (MAN OWN \rightarrow W)	0,084 (0,129)	[-0,182; 0,277]	32	0,000
	Quadratic term (MAN OWN \rightarrow W)	-0,018 (0,493)	[-2,751; 0,254]	32	0,000
Studies in which there is a cubic relationship	Linear term (MAN OWN \rightarrow W)	0,147 (0,123)	[0,025; 0,413]	14	0,000
	Quadratic term (MAN OWN \rightarrow W)	-0,152 (0,121)	[-0,413; 0,025]	14	0,000
	Cubic term (MAN OWN \rightarrow W)	0,152 (0,105)	[0,034; 0,409]	14	0,000

Notes: standard deviation in brackets.

Table 2 shows the prevailing positive relationship, which becomes negative for high levels of ownership concentration. In other words, it seems relevant empirically to investigate the existence of a non-monotonic relationship between ownership concentration and value. Therefore, the evidence seems to support the monitoring effect for low levels of ownership concentration, and the expropriation effect seems to prevail when ownership concentration is high. These results confirm the theoretical arguments in the literature. Weighing the results of different studies, there is clearly a positive relationship between ownership concentration and value and, in nonlinear models, the existence of a not monotonic link.

Also with regard to managerial ownership, through the results shown in Table 3, the contribution of meta-analysis seems to be extremely important for resolving contradictions in the literature. The results from the analysis of managerial ownership are robust regardless of the weight chosen for measuring effect size. The Zr-score in all cases shows the same sign. A significant positive relationship is found due to the effect of alignment of interests. At the same time, the nonlinear term is relevant and, therefore, this report seems to be non-monotonic.

The results by determining effect size, conducted on the link between ownership and value, as well as offering a summary of the many and varied evidences which have emerged in this regard in the literature, support the hypothesis that the joint consideration of linear models and linear terms obtained from the evidence of non-monotonic models would have a neutral impact on the estimated weighted effect size. The study of the linearity of the phenomenon under investigation can be conducted by incorporating the “pure” linear evidence offered and that offered by nonlinear models, without affecting the significance of the parameters and, therefore, the conclusions of the analysis itself. Meta-regression will help us to understand the statistical significance and economic importance, in terms of changes in signs, of non-linear terms.

Finally, it is possible to apply the test of homogeneity, Cochran’s Q test, calculated as shown in the Appendix A, which is statistically significant, indicating a high heterogeneity among studies. Therefore, even from a statistical point of view, the deepening of the fundamental sources of possible heterogeneity across studies by using the methodology of meta-regressions is noted.

5. Determinants of the relationship between ownership and value: the meta-regressions

The primary output of the meta-analysis concerns the study of moderating factors on the relationship between ownership and value. In fact, the high variability in the observed phenomenon, together with the controversial and heterogeneous results in each study, as well as what emerges from the Cochran Q test, highlight the need for further analysis through meta-regressions, examining the moderating role of some possible explanatory variables on the relationship between

ownership and value (Stanley 2001). In the moderator analysis, external factors are investigated that may influence the relationship, using meta-regressions which illustrate the variability of effect size (dependent variable) explained by moderating variables (explanatory variables). In other words, through meta-regressions, we study the extent to which the statistical heterogeneity between the results of different studies can be connected to one or more characteristics of the studies (Stanley and Jarrel, 1989)¹⁹. The exploration of this source of heterogeneity is the most valuable part of a meta-analysis. In particular, through the meta-regression, it is possible to verify whether the direction and strength of the relationship between ownership concentration and value (OC \Rightarrow W) and between managerial ownership and value (MO \Rightarrow W) are influenced by a number of moderating factors. Moderators are found by regressing a series of coded dummies as explanatory variables on the transformed values of Fisher's Z of adjusted correlations. The dichotomous explanatory variables provide information on the effect size differences due to the presence of a specific factor that distinguishes the studies (paper-specific characteristics). These are the factors that could cause controversy in the results reported in the literature (Hunter and Schmidt, 1990).

5.1 Model and variables

According to the formulated research questions, the following model is estimated, where the dependent variable is, alternatively, the effect size of ownership concentration on value, Z_r (OC \Rightarrow W), and that of managerial ownership on value, Z_r (MO \Rightarrow W).

$$\text{Effect size Ownership on Value } (Z_{r_{\text{Own} \rightarrow \text{W}}}) = f(\text{Moderating Factors}) \quad (1)$$

In particular, this paper intends to investigate 1) the role of non-monotonic relationship links between ownership and value, in order to understand how different levels of equity influence the processes of value creation and 2) the role of other moderating factors, in order to determine which features or paper-specific attributes may be able to influence the relationship between ownership and value. The choice of moderating factors is not random, but is based on the main theories about the phenomenon under analysis mentioned in the formulated research questions.

From an econometric point of view, the “weighted regressions” are used, in which the dependent variable is represented by unweighted effect size of ownership on value, while the weights are represented by the number of sample observations and the inverse of the variance. The features that discriminate the various studies, used as explanatory variables, are, however, approximated by dummy variables.

With regard to ownership concentration, we verify the relevance of a non-monotonic relationship by inserting the dummy variable *Ownership Concentration*² (D_OwnCon²), and to

¹⁹ Differences among studies included in the meta-analysis necessarily lead to statistical heterogeneity.

verify the possible role of non-linear models for managerial ownership the Dummies *Managerial Ownership*² (D_ManOwn²) and *Managerial Ownership*³ (D_ManOwn³) are inserted. In addition, other explanatory variables are considered as potential sources of heterogeneity among the different studies, by considerations that have emerged in the literature reference, and drawing inspiration from the work of Sánchez-Ballesta and García-Meca (2007).

Table 4 describes the moderating variables used in meta-regressions.

Table 4. Description of moderating variables.

Variable Name	Factors of heterogeneity	Description of the dummy variables
D_OwnCon ²	Role of non-linear effect of ownership concentration	Dummy equal to 1 for studies in which a non-linear effect of ownership concentration has been tested, and 0 otherwise.
D_ManOwn ²	Role of quadratic effect of managerial ownership	Dummy equal to 1 for studies in which a quadratic effect of managerial ownership has been tested, and 0 otherwise.
D_ManOwn ³	Role of cubic effect of managerial ownership	Dummy equal to 1 for studies in which cubic effect of managerial ownership has been tested, and 0 otherwise.
D_CivilLaw	Role of the legal system	Dummy equal to 1 for studies related to Civil Law contexts and 0 with reference to common law contexts.
D_Listing	Type of firm	Dummy equal to 1 for studies that concerns listed companies and 0 otherwise.
D_Endogeneity	Role of econometric techniques used: consideration of endogeneity	Dummy equal to 1 for studies that have been monitoring problems of endogeneity (2SLS, 3SLS and GMM) and 0 otherwise.
D_80, D_90 and D_00	Role of the period of analysis	D_80 is dummy equal to 1 for studies where the period of the analysis of the sample the paper is based on concerns the eighties and 0 otherwise. D_90 is a dummy equal to 1 for studies where the period of the analysis of the sample the paper is based on concerns the nineties and 0 otherwise. D_00 is a dummy equal to 1 for studies where the period of the analysis of the sample the paper is based on concerns the two thousand years and 0 otherwise.
D_Accounting	Performance measures	Dummy equal to 1 for studies that have used measures of accounting performance and 0 for studies that have used measures of market performance.

The role of the features that are considered as moderators can be assessed directly in a single meta-regression by including all covariates simultaneously, without single univariate meta-regressions. To determine whether there is a causal relationship between two variables (a single moderator and the effect size), it is important to verify the existence of a relationship between the two variables, without the intervention of a third variable. In other words, it is necessary to verify the absence of multicollinearity among the covariates through the VIF test (variance inflation factor), which has confirmed the validity of the analysis.

Several econometric issues affect the application of meta-regression. Although it is possible to apply a standard OLS regression²⁰, it is appropriate to use a variance-weighted regression, in

²⁰ The observations are presumed to be independent, which is incorrect. In addition, standard errors too small for the parameter estimates are generated, and then, too many effects are considered significant.

which the dependent variable is represented by the effect size of each study (unweighted), weighting the regression, so that more precise studies have more influence in the analysis. Comparing the available methodologies, widely analyzed in literature, the random effect model should be preferred over the fixed effect approach.

The fixed effect model assumes that all the heterogeneity in effect size may be explained by differences in the characteristics of the studies, basing the weighting on standard errors of the original regressions. This approach is not recommended. There will be differences in the studies, i.e. due to differences in the samples and analysis techniques, which justify the use of random effect models (e.g., Hunter and Schmidt 2000). The random effect model considers both the within-variance (error in each study) and the between-variance (variability in the population of effect size). Several methods have been proposed for the estimation of between-study variance in meta-regression: it can be calculated by the Restricted Maximum Likelihood Process (REML), or, alternatively, using the Empirical Bayesian method. Based on the theoretical reasons and outcome of Q-test, the meta-regressions have been conducted through the random effect model and the “metareg” command of Stata software, which allows the application of REML and Bayesian techniques.

5.2 Results of the meta-regressions

This section verifies the role of moderating factors on the ownership-value relationship. The results of the meta-regressions are presented in Table 5, separately for ownership concentration and managerial ownership. In all of the variance-weighted regressions the dependent variable is represented by the unweighted effect size, while the weights were assigned using the inverse of the variance. In the first two columns, the dependent variable is the effect of ownership concentration on value, while in the last two columns it is the effect of managerial ownership on value. For both dependent variables the REML model and the empirical Bayesian model are applied. The maximum value of VIF index for each explanatory variable, not shown, is lower than the threshold of 5, suggesting the absence of collinearity problems. The R^2 statistics indicate the greater explanatory power of the model that analyzes managerial ownership in comparison to that which analyzes ownership concentration.

Table 5. Results of the meta-regressions on the ownership-value relationship.

<i>Moderating Variables</i>	Dependent Variable: $Zr(OC \Rightarrow W)$		Dependent Variable: $Zr(MO \Rightarrow W)$	
	(1) REML	(2) Emp. Bayes	(3) REML	(4) Emp. Bayes
D_ OwnCon ²	-0.031 (0.033)	-0.027 (0.026)		
D_ ManOwn ²			-0.082*** (0.028)	-0.084*** (0.021)
D_ ManOwn ³			0.233*** (0.032)	0.219*** (0.024)
D_ CivilLaw	0.076** (0.030)	0.076*** (0.024)	0.006 (0.042)	0.014 (0.034)
D_ Accounting	-0.024 (0.027)	-0.029 (0.021)	-0.052** (0.026)	-0.052*** (0.019)
D_ Listing	0.077** (0.034)	0.078*** (0.029)	-0.001 (0.044)	-0.006 (0.034)
D_ Endogeneity	0.011 (0.028)	0.009 (0.022)	-0.081*** (0.027)	-0.082*** (0.021)
D_ 80	0.054* (0.029)	0.058** (0.023)	-0.017 (0.024)	-0.013 (0.017)
D_ 90	0.068** (0.031)	0.068*** (0.024)	-0.079*** (0.023)	-0.079*** (0.017)
D_ 00	0.092** (0.039)	0.094*** (0.033)	0.074 (0.067)	0.069 (0.059)
Constant	-0.169*** (0.041)	-0.168*** (0.034)	0.141*** (0.047)	0.145*** (0.036)
Number of observations	82	82	95	95
R ² _{adjusted}	0.210	0.313	0.716	0.765
Test-F (p-value)	0.000	0.000	0.000	0.000

Notes: In the first two columns the dependent variable is the effect of ownership concentration on value, while in the latter two it is the effect of managerial ownership on value. The econometric techniques applied to the meta-regressions are: 1) the model REML (restricted, maximum likelihood) and 2) the empirical Bayesian model. The moderating variables are shown in Table 4. In brackets there are the standard errors. (*) (**) and (***) indicate statistical significance of each coefficient to a level of 10%, 5% and 1% respectively.

The coefficient D_ OwnCon² is not statistically significant. Similarly to the results of Sánchez-Ballesta and García-Meca (2007), the impact on the value does not depend on the level of ownership concentration. Consequently, the hypothesis of a quadratic relationship between ownership concentration and value is rejected, noting the significance of a linear relationship.

The same methodology was repeated with reference to the relationship between managerial ownership and value (columns 3 and 4 in Table 5). The evidence confirms the existence of a nonlinear relationship, as argued in the literature and in a similar review by Sánchez-Ballesta and García-Meca (2007). Confirming what was noted by Morck *et al.* (1988) the impact of managerial ownership on value first increases, then decreases and finally increases again

After investigating the role of non-linearity of the models, the next step in this empirical work is to verify the relevance of possible factors of heterogeneity between studies in explaining

differences in the relationship between ownership and value. Recovering an earlier work conducted by Sánchez-Ballesta and García-Meca (2007), the factors identified as sources of heterogeneity are shown in Table 4. In particular, the identified potential sources of heterogeneity are: the legal system, the measures of value used, the size in terms of status of listed company, the econometric technique and the period of analysis.

The inclusion of the legal system as a source of heterogeneity between the studies is aimed at verifying the claims of La Porta *et al.* (1999). Differences in the level of investor protection, because of inefficiencies in the legal and judicial systems, lead to greater ownership concentration, with positive consequences on value. The results for ownership concentration confirm the role of the legal system in explaining the relationship between ownership structure and value. In particular, in civil law contexts the positive relationship between ownership concentration and value is amplified. The level of protection granted to investors also justifies the choice of a more appropriate governance model. Regarding the relationship between managerial ownership and value there is a lack of significance of the variable *D_CivilLaw*; the contrasting results in the literature do not seem interpretable because of the legal structure of reference. In summary, the effect of managerial ownership on value does not seem to depend on the institutional context of reference, while the role of ownership concentration is different based on country specific factors. This evidence supports the work conducted by Gedajlovic and Shapiro (1998).

The empirical evidence indicates that the performance measures used in empirical analysis are a source of heterogeneity only for the effect of managerial ownership. In particular, accounting measures tend to reduce the intensity of the positive relationship between managerial ownership and value, which manifests itself in a much more significant way on market performance variables. On the contrary, the choice of performance variable to approximate the value (accounting, mixed or market) does not affect the relationship between ownership concentration and value.

Another factor that could alter the relationship between ownership structure and value is endogeneity. This term refers to situations of interdependence and mutual causality between variables, as determined by the presence of covariation in the absence of causation. This problem involves the phenomena of distortion in signs and magnitude of the observed relationship. Many scholars, including Demsetz and Villalonga (2001), argue that direction and magnitude of the observed relations depend on the econometric technique used. Bhagat and Jefferis (2002) attribute the main limitation in the evaluation of the relationship between ownership structure and value to endogeneity. The appropriate techniques for controlling problems of endogeneity are the 2SLS (two stage least square), the 3SLS (three stage least square) and GMM (generalized method of moments). The statistical significance of the variable *D_Endogeneity* shows the importance of this factor as a

source of heterogeneity among studies with regard to the relationship between managerial ownership and value. Considering problems of endogeneity, there is a lower intensity of this relationship. In contrast, the effect of ownership concentration on value seems not to depend on any issues of mutual causality.

The introduction of variables that consider the period of time of the sample of each single paper as a measure of moderation allows us to verify the possibility of changes in sign or in intensity of the relationship because of a general trend. Changes in relationships over time could be due to greater availability of databases, or reforms in company law and the financial market. Including the variable *D_Endogeneity* allows the exclusion of time dummies that are influenced by advances in econometric techniques used. The evidence found about ownership concentration indicates the importance of the time variables. The relationship between ownership concentration and value seems to become more intense in the year two thousand, compared to the nineties and the eighties. On the contrary, the relationship between managerial ownership and value is influenced by time only with reference to the nineties. In this period, the relationship between managerial ownership and value manifests a lesser intensity.

Firm size, measured by distinguishing between listed and unlisted companies, is important for pointing out the difference in the intensity of the relationship between ownership concentration and value. In listed companies the importance of the role of the majority shareholder increases, active in monitoring the decisions of managers and reducing problems of opportunism. It does not appear, however, that the listing has an impact on the relationship between managerial ownership and value.

As robustness in the Appendix B we run the meta-regressions for each moderator one at a time, first of all for considering ownership concentration as dependent variables and then considering managerial ownership as dependent variable. In general the coefficients are stronger because did not apply the so called *ceteris paribus* effect. Our main results are confirmed.

6. Conclusions and limitations

This paper analyzes one of the main mechanisms of corporate governance, i.e. the ownership structure of firms in terms of ownership concentration and managerial ownership. In particular, through the tool of meta-analysis, an innovative methodological approach able to synthesize the state of the art and the sources of heterogeneity among the studies on a given theme, the role of ownership in the process of governance and creation of firm value has been examined in depth. We have studied the direction and strength of the relationship between ownership and value, investigating the possible causes of controversial empirical results found in literature. The results

offer a number of suggestions for further research on the subject of investigation and, hopefully, ideas for actions to improve corporate governance.

This study reveals the extreme importance of ownership in the creation of value. With reference to the relationship between ownership concentration and value, there is a prevalence of a positive relationship; even in the presence of high levels of ownership concentration, effects resulting from entrenchment do not outweigh the benefits in terms of monitoring of the management by controlling shareholders. Regarding the relationship between managerial ownership and value, there is the existence of a non-linear relationship, with an impact of managerial ownership on value, initially increasing and then decreasing. A still limited number of evidences seem to reveal a cubic relationship that, for high levels of managerial ownership, assumes an increasing trend again, as argued in the literature by Morck *et al.* (1988). The second and most important output of the meta-analysis is provided by the meta-regressions, which show how the relationship between ownership and value is, in fact, moderated by some factors that influence direction and intensity, such as the legal system, the econometric techniques used, the period of analysis, firm-specific factors and performance measures. In fact, the controversial results that emerge in the literature on the relationship between ownership and value often depend on not having properly taken into account intervening factors that represent sources of heterogeneity in empirical evidences. Future research should investigate the role of these variables, as well as the possible moderating effect of other variables of governance, going more deeply into the question of the presence of relations of complementarity or substitutability between instruments of corporate governance. For example, further meta-analysis should take into account empirical evidences that examine multiple classes of stocks and pyramid structures, which entail different between voting and cash-flow rights.

The benefits of ownership have always seemed tangible and visible; but there are costs of ownership, with reference to problems of opportunism to the detriment of small investors and corporate stakeholders. It is necessary, therefore, to take into account the capacity of the ownership structure to affect the value of the firm, limiting potential conflicts of interest and opportunistic behavior, in addition to the direct impact in promoting virtuous processes of governance. For example, with reference to ownership concentration, the presence of an active subject that is interested in the management of the firm would seem to offer a positive contribution in promoting the improvement of corporate performance. Therefore, there is a need to develop a broader knowledge of how the potential benefits/costs arising from an ownership structure, capable of providing a system of incentives and control that preserves the efficient allocation of resources in the processes and activities of governance, can be influenced by other variables of moderation.

References

* articles included in the meta-analysis.

- *Adams, R.B. and J.A.C. Santos (2006) "Identifying the effect of managerial control on firm performance" *Journal of Accounting and Economics* **41**, 55-85.
- *Agrawal, A. and C.R. Knoeber (1996) "Firm performance and mechanisms to control agency problems between managers and shareholders" *Journal of Financial and Quantitative Analysis* **31**, 377-397.
- Agrawal, A. and G. Mandelker (1987) "Managerial Incentives, corporate investment and financing decisions" *The Journal of Finance* **42**(4), 823-837.
- Agrawal, A. and G. Mandelker (1990) "Large shareholder and the monitoring of managers: the case of antitakeover charter amendments" *Journal of Financial and Quantitative Analysis* **25**(2), 143-161.
- *Andres, C. (2008) "Large shareholders and firm performance-An empirical examination of founding family ownership" *Journal of Corporate Finance* **14**, 431-445.
- Barclay, M.J. and C.G. Holderness (1991) "Negotiated block trades and corporate control" *The Journal of Finance* **46**(3), 861-878.
- Barney, J. (1991) "Firm Resources and Sustained Competitive Advantage" *Journal of Management* **17**(1), 99-120.
- Becht, M., Bolton, P. and A. Röell (2003) "Corporate governance and control" *Handbook of the Economics of Finance*, **1**, 1-109.
- *Beiner, S., Drobetz, W., Schmid, M.M. and H. Zimmermann (2006) "An integrated framework of corporate governance and firm valuation" *European Financial Management* **12**(2), 249-283.
- Berle, A.A. and G.C. Means (1932) *The Modern Corporation and Private Property*, Macmillan Publishing Co., New York.
- Bethel, J.E., Liebeskind, J.P. and T. Opler (1998) "Block share purchases and corporate performance" *The Journal of Finance* **53**(2), 605-634.
- *Bhabra, G.S. (2007) "Insider ownership and firm value in New Zealand" *Journal of Multinational Financial Management*, **17**, 142-154.
- Bhagat, S. and R. Jefferis (2002) *The econometrics of corporate governance studies*, The MIT Press.
- Börsch-Supan, A. and J. Köke (2002) "An Applied Econometricians' View of Empirical Corporate Governance Studies" *German Economic Review* **3**(3): 295-326.
- *Boubraki, N., Cosset, J. C. and O. Guedhami (2005) "Post privatization corporate governance: the role of ownership structure and investor protection" *Journal of Financial Economics* **76** (2), 369-399.
- *Callahan, W., Millar, J. and C. Schulman (2003) "An analysis of the effect of management participation in director selection on the long-term performance of the firms" *Journal of Corporate Finance* **9**, 169-181.
- *Chen, C.R., Guo, W. and V. Mande (2006) "Corporate value, managerial stockholdings and

investments of Japanese firms” *Journal of International Financial Management and Accounting* **17**(1), 29-51.

Cho, D. and J. Kim (2007) “Outside Directors, Ownership Structure and Firm Profitability in Korea” *Corporate Governance: An International Review* **15**(2), 239-250.

*Cho, M.H. (1998) “Ownership Structure, investment, and the corporate value: an empirical analysis” *Journal of Financial Economics* **47**, 103-121.

Cohen, J. (1977) *Statistical Power Analysis for the Behavioral Sciences*, NY, Academic Press.

Cronqvist, H. and M. Nilsson (2003) “Agency cost of controlling minority shareholders” *Journal of Financial and Quantitative Analysis* **38**(4): 695-719.

*Cui, H. and Y.T. Mak (2002) “The relationship between managerial ownership and firm performance in high R&D firms” *Journal of Corporate Finance* **8**, 313-336.

*Davies, J.R., Hiller, D. and P. McColgan (2005) “Ownership structure, managerial behaviour and corporate value” *Journal of Corporate Finance* **11**, 645-660.

De Miguel, A., Pindado, J. and C. De La Torre (2003) “How does Ownership Structure Affect Firm Value? A Comparison using different Corporate Governance Systems” SSRN Working Paper 479322.

*De Miguel, A., Pindado, J. and C. De la Torre (2004) “Ownership structure and firm value: new evidence from the Spanish corporate governance system” *Strategic Management Journal* **25**, 1199-1207.

Demsetz, H. (1983) “The structure of ownership and the theory of the firm” *Journal of Law and Economics* **26**, 375-390.

Demsetz, H. and K. Lehn (1985) “The structure of corporate ownership: causes and consequences” *Journal of Political Economy* **93**(6), 1155-1177.

*Demsetz, H. and B. Villalonga (2001) “Ownership structure and corporate performance” *Journal of Corporate Finance* **7**, 209-233.

Denis, D.K. (2001) “Twenty-five years of corporate governance research...and counting” *Review of Financial Economics* **10**, 191-212.

Denis, D.K. and J. McConnell (2005) “International Corporate Governance”, in K. Jeasey, S. Thompson, M. Wright, *Corporate Governance: Accountability, Enterprise and International Comparisons*, Wiley Ed., West Sussex.

*Earle, J.S., Kucsera, C. and A. Telegdy (2005) “Ownership concentration and corporate performance on the Budapest Stock Exchange: do too many cooks spoil the Goulash?” *Corporate Governance: An International Review* **13**(2), 254-264.

Faccio, M., Lang, L.H.P., and L. Young (2001) “Dividends and expropriation” *American Economic Review* **91** (1), 54-78.

Fama, E. and M. Jensen (1983) “Separation of ownership and control” *Journal of Law and Economics* **26**(2), 301-325.

*Farrer, J. and M. Ramsay (1998) “Director share ownership and corporate performance-evidence

from Australia” *Corporate Governance: An International Review* **6**(4), 233-248.

*Fich, E.M. and A. Shivdasani (2006) “Are busy boards effective monitors?” *The Journal of Finance* **61**(2), 689-724.

*Gedajlovich, E.R. and D.M. Shapiro (1998) “Management and ownership effects: evidence from five countries” *Strategic Management Journal* **19**, 533-553.

Glass, G.V. (1976) “Primary, secondary and meta-analysis of research” *Educational Researcher* **5**, 3-8.

Glass, G.V. McGaw, B. and M.L. Smith (1981) *Meta-Analysis in Social Research*, Beverly Hills, CA, Sage.

*Griffith, J. M. (1999) “CEO ownership and firm value” *Managerial and Decision Economics* **20**(1), 1-8.

Hamilton, B. and J. Nickerson (2003) “Correcting for endogeneity in strategic management research” *Strategic Organization* **1**, 53–80.

Hedges, L.V. (1992) “Meta-analysis” *Journal of Educational Statistics* **17**(4), 279-296.

*Himmelberg, C., Hubbard, G. and D. Palia, (1999) “Understanding the determinants of managerial ownership and the link between ownership and performance” *Journal of Financial Economics* **53**, 353-384.

Holderness, C.G. (2009) “Do Differences in Legal Protections Explain Differences in Ownership Concentration?” Working Paper.

Holderness, C.G. and D.P. Sheehan (1985) “Raiders or saviors? The evidence on six controversial investors” *Journal of Financial Economics* **14**, 555-579.

*Hovey, M., Li, L. and T. Naughton (2003) “The relationship between valuation and ownership of listed firms in China” *Corporate Governance: An International Review* **11**(2), 112-122.

Hunter, J. and F. Schmidt (1990) *Methods of meta-analysis: Correcting error and bias in research findings*, Sage.

Jensen, M. and W. Meckling (1976) “Theory of the Firms Managerial Behavior, Agency cost and Ownership Structure” *Journal of Financial Economics* **3**, 305- 360.

Jensen, M. and K. Murphy (1990) “Performance pay and top management incentives” *Journal of Political Economy* **98**, 225-264.

*Joh, S. W. (2003) “Corporate governance and firm profitability: evidence from Korea before the economic crisis” *Journal of Financial Economics* **68**, 287-322.

*Kaserer, C. and B. Moldenhauer (2008) “Insider ownership and corporate performance-Evidence from Germany” *Review of Managerial Science* **2**(1), 1-35.

Kulinskaya, E., Morgenthaler, S. and R.G. Staudte (2008) *Meta Analysis: a Guide to Calibrating and Combining Statistical Evidence*, Wiley Series in Probability and Statistics.

La Porta, R., Lopez de Silanes, F., Shleifer, A. and R. Vishny (1998) “Law and finance” *Journal of Political Economy* **6**, 1113-1355.

- La Porta, R., Lopez de Silanes, F., Shleifer, A. and R. Vishny (1999) "Corporate Ownership around the world" *The Journal of Finance* **54**, 471-518.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., and and R. Vishny (2000) "Investor protection and corporate governance" *Journal of Financial Economics* **58**, 3-27.
- Lazzari, V. (2001) "Corporate Governance: fondamenti, aspetti controversi e prospettive future". *Economia & Management* **3**, 71-84.
- Leech, D. and J. Leahy (1991) "Ownership structure, control type classifications and the performance of large British Companies" *Economic Journal* **101**(2), 1418-1437.
- *Lehmann, E. and J. Weigand (2000) "Does the Governed Corporation Perform Better?: Governance Structures and Corporate Performance in Germany" *European Finance Review* **4**(2), 157-195.
- *Loderer, C. and K. Martin (1997) "Executive stock ownership and performance: tracking faint traces" *Journal of Financial Economics* **45**, 223-255.
- Loderer, C. and U. Waelchli (2010) "Protecting Minority Shareholders: Listed versus Unlisted Firms" *Financial Management* **39**, 33 – 57.
- *Maury, B. (2006) "Family ownership and firm performance: empirical evidence from Western European Corporations" *Journal of Corporate Finance* **12**, 321-341.
- McConnell, J. and H. Servaes (1990) "Additional evidence on equity ownership and corporate value" *Journal of Financial Economics* **27**, 595-612.
- McConnell, J., Servaes, H. and K.V. Lins (2008) "Changes in insider ownership and changes in the market value of the firm" *Journal of Corporate Finance* **14**, 92-106.
- *Morck, R., Nakamura, M. and A. Shvdasani (2000) "Banks, ownership structure, and firm value in Japan" *Journal of Business* **73**(4), 539-567.
- Morck, R., Shleifer, A. and R. Vishny (1988) "Management ownership and market valuation: an empirical analysis" *Journal of Financial Economics* **20**, 293-313.
- *Palia, D. (2001) "The endogeneity of managerial compensation in firm valuation: a solution" *The Review of Financial Studies* **14**(3), 539-567.
- *Perrini, F., Rossi, G. and B. Rovetta (2007) "Concentrati è meglio? Assetti proprietari e performance: un'indagine empirica" *Economia & Management* **4**, 37-56.
- *Perrini, F., Rossi, G. and B. Rovetta (2008) "Does ownership structure affect performance? Evidence from the Italian Market" *Corporate Governance: An International Review* **16**(4), 312-325.
- Prowse, S. (1992) "The structure of corporate ownership in Japan" *The Journal of Finance* **47**, 1121-1140.
- *Randoy, T. and S. Goel (2003) "Ownership structure, founder leadership, and performance in Norwegian SMEs: implications for financing entrepreneurial opportunities" *Journal of Business Venturing* **18**, 619-637.
- Rhoades, L., Eisenberger, R., and S. Armeli (2001) "Affective commitment to the organization: The

contribution of perceived organizational support” *Journal of Applied Psychology* **86**(5), 825.

Sánchez-Ballesta, J.P. and E. García-Meca (2007) “A meta-analytic vision of the effect of ownership structure on firm performance” *Corporate Governance: An International Review* **15**(5), 879-893.

*Seifert, B., Gonenc, H. and J. Wright (2005) “The international evidence on performance and equity ownership by insiders, blockholders, and institutions” *Journal of Multinational Financial Management* **15**, 171-191.

Shleifer, A. and R.W. Vishny (1986) “Large shareholder and corporate control” *Journal of Political Economy* **94**, 461-488.

Shleifer, A. and R.W. Vishny (1989) “Managerial entrenchment. The case of manager specific investments” *Journal of Financial Economics* **25**, 123-144.

Shleifer, A. and R.W. Vishny (1997) “A survey of corporate governance” *The Journal of Finance* **52**(2), 737-783.

*Short, H. and K. Keasey (1999) “Managerial ownership and the performance of firms: Evidence from the UK” *Journal of Corporate Finance* **5**, 79-101.

*Slovin, M.B. and M.E. Sushka (1993) “Ownership Concentration, Corporate Control Activity, and Firm Value: Evidence from the Death of Inside Blockholders” *The Journal of Finance* **48**(4), 1293-1321.

Stanley, T.D. (2001) “Wheat from Chaff: Meta-Analysis as Quantitative Literature Review” *Journal of Economic Perspectives* **15**, 131-150.

Stanley, T.D. and S.B. Jarrell (1989) “Meta-regression analysis: a quantitative method of literature surveys” *Journal of Economic Survey* **3**(2), 161-170.

Stulz, R. (1988) “Managerial control of voting rights: Financing policies and the market for corporate control” *Journal of Financial Economics* **20**, 25-54.

*Thomsen, S. and T. Pedersen (2000) “Ownership structure and economic performance in the largest European companies” *Strategic Management Journal* **21**(6), 689-705.

*Thomsen, S., Pedersen, T. and H.K. Kvist (2006) “Blockholder ownership: Effects on firm value in market and control based governance systems” *Journal of Corporate Finance* **12**, 246-269.

Villalonga, B. and R. Amit (2006) “How do family ownership, control, and management affect firm value?” *Journal of Financial Economics* **80**, 385-417.

*Wei, Z. and O. Varela (2003) “State equity ownership and firm market performance: evidence from China’s newly privatized firms” *Global Finance Journal* **14**, 65-82.

*Yeh, Y.H. (2005) “Do controlling shareholders enhance corporate value?” *Corporate Governance: An International Review* **13**(2), 313-325.

*Yermack, D. (1996) “Higher market valuation of companies with a small Board of directors” *Journal of Financial Economics* **40**, 185-211.

Zingales, L. (1998) Corporate Governance. In P. Newman (ed.) *The New Palgrave Dictionary Of Economics and the Law*, MacMillan NY.

Appendix A

To calculate the effect size, the formulations proposed by Copper and Hedges (1994) are applied.

$$r_i = \sqrt{\frac{t^2}{t^2 + df}} \quad (1) \quad Z_{r_i} = \frac{1}{2} \ln\left(\frac{1+r_i}{1-r_i}\right) \quad (2) \quad \bar{Z}_r = \frac{\sum_{i=1}^k w_i Z_{r_i}}{\sum_{i=1}^k w_i} \quad (3)$$

$$w_i = \frac{1}{v_i} \quad w_i = \frac{1}{(SE)_i^2} \quad (4) \quad SD_{(Zr)} = \sqrt{\frac{(Zr - \bar{Z}_r)^2}{n}} \quad (5)$$

Equation (1) proposes the first step to calculate effect size. “r” indicates the correlation coefficient determined for the study, “t” is the Student’s t and df indicate the degrees of freedom. If the value of Student’s t is not directly found in the study, it can be easily calculated through the relationship between beta and the standard error. If there is only the p-value, it is possible to apply a conversion formula²¹. Equation (2) allows to standardize the correlation in a Z-score, which is comparable among different observations and that can be used to determine an average value (equation 3) weighted by the inverse of the variance (Equation 4) and a standard deviation equal to what is indicated in equation (5). Finally, supporting the results of the meta-analysis, it is possible to apply the test of homogeneity, that is Cochran’s Q test, calculated as indicated in equation (6), which allows to measure the degree of heterogeneity among studies.

$$Q = \sum w_i (Z_r - \bar{Z}_r)^2 \quad \sim \chi_{k-1}^2 \quad (6)$$

If such test, which follows a χ^2 distribution with K-1 degrees of freedom, is statistically significant, the null hypothesis is rejected in favor of the hypothesis of heterogeneity among the studies.

²¹ For example, the conversion formula in excel is: INV.T (p-value, degrees of freedom). It should also point out that the formula given above will give a positive value; it is therefore appropriate do a correction for the correct sign.

Appendix B

Results of the meta-regressions considering the effect of each moderator one at a time.

<i>Moderating Variables</i>	(1) Dependent Variable: Zr(OC \Rightarrow W)			(2) Dependent Variable: Zr(MO \Rightarrow W)		
	Coeff (pvalue)	Obs.	R ² _{adjusted}	Coeff (pvalue)	Obs.	R ² _{adjusted}
D_ OwnCon ²	-0.0793*** (0.0298)	82	0.074			
D_ ManOwn ²				-0.117*** (0.0403)	95	0.319
D_ ManOwn ³				0.194*** (0.0372)	95	
D_ CivilLaw	0.0996*** (0.0282)	82	0.061	0.0661** (0.0297)	95	0.220
D_ Accounting	0.00604 (0.0247)	82	0.009	-0.0574** (0.0254)	95	0.025
D_ Listing	0.0488** (0.0236)	82	0.020	0.000313 (0.0306)	95	0.043
D_ Endogeneity	0.0157 (0.0269)	82	0.011	-0.0204 (0.0307)	95	0.067
D_ 80	0.0527* (0.0309)	82	0.046	-0.0999*** (0.0296)	95	0.020
D_ 90	0.0650** (0.0302)	82	0.037	-0.00707 (0.0454)	95	0.051
D_ 00	0.0428 (0.0301)	82	0.051	0.194*** (0.0372)	95	0.036

Notes: In column (1) the dependent variable is the effect of ownership concentration on value, while in column (2) the effect of managerial ownership on value. The econometric technique applied to the meta-regressions is the REML model (restricted, maximum likelihood). In column (2) the two coefficients concerning managerial ownership (D_ ManOwn² and D_ ManOwn³) are included in the same meta-regression. In brackets there are the p-value. (*) (**) and (***) indicate statistical significance of each coefficient to a level of 10%, 5% and 1% respectively.