



## The Relationship between Ownership and Performance: A Review of Theory and Evidence

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### Abstract

This paper surveys the theoretical basis for, and empirical evidence on the relationship between ownership structure and corporate performance from two perspectives: ownership concentration and managerial ownership. We pay special attention to see reasons for discrepancies among previous empirical research, such as corporate governance environments, data issues, variable measurements, and estimation methods. General directions for future work are discussed as well.

**Keywords:** Ownership concentration, Managerial ownership, Corporate performance

### 1. Introduction

What ultimately matters for companies, policy makers and economists alike is whether ownership structure affects corporate performance, and if so, how. The fundamental insight into the issues dates back to Berle and Means (1932), who argue that the separation of ownership and control of modern corporations naturally reduces management incentives to maximize corporate efficiency. Their concerns were later developed by Jensen and Meckling (1976) into that has subsequently become known as “agency theory”, which has been characterized as “a theory of the corporate ownership structure” and the guiding framework for ownership-performance studies. The central premise of the theory is that self-interested managers (controllers or agents) can engage in decision making and behaviors that may be inconsistent with maximizing value of shareholders (owners or principals). Ownership structure is often thought as an important instrument for corporate governance to resolve the conflict of interests between shareholders and managers. The past 30 years have witnessed the rapidly growing literature on this topic. Early work was largely descriptive. The empirical research appeared in the mid-1980s and has gotten a lot of attention recently.

The purpose of this paper is to survey the theory and evidence on the relationship between ownership structure and corporate performance. We divide the current literature in this area into two streams, one concerning the efficacy of concentration of ownership; the other revealing the distinctive motivations, abilities, and effectiveness of managerial ownership to influence corporate value. Although the ownership-performance relationship has been a hot topic for decades, scholars have not reached an agreement with it. Generally speaking, theoretical and empirical researches supplement each other. Since the ownership-performance relation is subject to controversy in theory, empirical research becomes more important to examine which of the logically possible explanations is the most probable. This paper emphasizes the consistency between theory and empirical evidence in this field. We take a step further to analyze the reasons for discrepancies among previous research. The most important reason is that the ownership-performance relation varies with the realities of corporate governance environments in which firms are embedded. The disagreement is also a reflection of differences in estimating technique applied – whether and how to account for the endogeneity of ownership, and a reflection of limitations on the ownership and performance measurements, data quality and selection bias.

The remainder of this paper is organized as follows. Section 2 summarizes main competing views and empirical findings on the relationship between ownership concentration and corporate performance. Section 3 examines the distinctive roles of managerial ownership on performance. Reasons for discrepancies among previous empirical findings are discussed in section 4. Finally, conclusions and suggestions for further research are provided in section 5.

## **2. Concentration of ownership and performance**

### *2.1 Efficacy of ownership concentration: monitoring vs. expropriation*

Until the 1980s, the agency conflict between shareholders and managers has been the main concern of the literature on corporate governance. It is widely accepted that ownership concentration has the potential to limit the agency problem, and then generate improved corporate performance. This positive effect of ownership concentration can be explained by the efficient monitoring hypothesis, which contends that higher concentration of ownership gives large shareholders stronger incentives and greater power at lower cost to monitor management. Grossman and Hart (1986) argue that shareholders with a large stake in the company show more willingness to play an active role in corporate decisions because they partially internalize the benefits from their monitoring effort. The methods used by large shareholders to monitor and intervene are range from informal conversations with management to formal proxy contests (Shleifer and Vishny, 1986, 1997). Even when they cannot monitor the management themselves, large shareholders can facilitate third party takeovers by splitting the large gains on their own shares with the bidder.

Since the late 1990s, the potential conflict of interest between controlling shareholders and minority investors has become a focus of academics' attention. Concentrated ownership structure may permit dominant shareholders expropriate minority investors, known as the expropriation-of-minority-shareholders hypothesis. Large shareholders represent their own interests, which need not coincide with the interests of other stakeholders in the firm. Pyramidal control structure, cross shareholding, and super-voting rights allow the controlling shareholders to secure control rights without commensurate cash flow rights (La Porta et al., 1999; Claessens et al., 2000). The divergence between control rights and cash flow rights induces the pervasive problems of controllers' expropriation (Denis and McConnel, 2003; John C. Coffee, 2005). Johnson et al. (2000) use the term "tunneling" to describe the transfer of resources out of firms for the benefits of controlling shareholders. Small investors' fear of being expropriated may induce the high cost of capital to firms, so it follows inefficient investment.

### *2.2 Empirical evidence*

Theoretical arguments alone cannot unambiguously predict whether benefits of monitoring outweigh costs of expropriations at the given level of concentration. The link between concentration and corporate value is thus an empirical matter. Demsetz and Lehn (1985) were the first to empirically analyze the relationship. They argue that ownership concentration is determined by firm size, control potential, regulation and amenity potential, and then estimate linear regressions of accounting profit rate on concentration — the fractions of shares owned by the five, the twenty largest shareholders, and a Herfindahl measure for 511 U.S. firms. No significant relationship between ownership concentration and accounting profit rate is found (Table 1). Holderness and Sheehan (1988) compare 101 pairs of listed firms and reach the same conclusion of no systematic performance difference associated with large U.S. shareholders.

In contrast, in Continental Europe and East Asian economies, studies suggest that block ownership per se might often have a positive effect on firm performance for better monitoring. Claessens and Djankov (1999) find a 10 percent increase in concentration leads to a 2 percent increase in short-term labor productivity and a 3 percent increase in short-term profitability in the Czech Republic. Earle et al. (2005) imply that the size of the largest block increases profitability and efficiency strongly and monotonically in Hungary over 1996 to 2001. Xu and Wang (1999) find a positive relation between concentration and performance in China.

## **3. Managerial ownership and performance**

### *3.1 Efficacy of managerial ownership: alignment vs. entrenchment*

Some shareholders may be entirely passive investors, whereas others are more active and do perform an important monitoring service. Various motivations and abilities of different types of shareholders may result in their distinctive effectiveness to influence major corporate decisions and value. Managerial ownership (insider ownership) is the most popular topic that has been extensively studied. Jensen and Meckling (1976) formalize the relation between managerial ownership and corporate value. They propose the convergence-of-interest hypothesis to explain the positive effect of managerial ownership. That is, a sufficiently high level of managerial ownership helps align the interests of managers and shareholders resulting in superior performance. A manager's claim on the performance outcomes and burden on the costs associated with non-value maximizing behavior increase with his fraction of the equity. Thus, a high level of managerial ownership increases the probability that the manager devotes significant effort to creative activities and immunizes himself from misappropriating the corporate resources. The manager will act to maximize firm/shareholder value due to his own interests.

However, Demsetz (1983) and Fama and Jensen (1983) propound offsetting costs of significant management ownership – the managerial entrenchment hypothesis. According to this hypothesis, the firm will be less valuable when managers with a significant equity have enough voting power to ensure their position inside the firm or to allow their free from outside checks. A manager held smaller shares can be disciplined toward firm value maximization by the market forces, while a manager controlled a substantial equity can entrench himself from the market restriction, such as the takeover threat or the managerial labor market. Consistent with this, Stulz (1988) develops a model of firm valuation to explain how large shareholdings help managers to be entrenched and decrease the monitoring of external control mechanisms. The impact of managerial ownership on performance therefore is a double-edged sword.

### 3.2 Endogeneity of ownership

The initial argument about the endogeneity of ownership structure is formulated by Demsetz (1983). He contends that ownership structure should be thought of as an endogenous outcome of decisions that ought to be influenced by the profit-maximizing interests of shareholders. An optimal ownership level is likely to vary with certain firm characteristics. Some factors (firm size, industry, investor protection, etc.) that determine ownership structure probably also have significant effects on performance. It is complicated to evaluate the effects of ownership structure which is itself endogenous to the system that includes performance goals. For example, that the presence of concentrated ownership has a positive influence on performance may mean that firm value is higher due to better monitoring by large shareholders. However, it could also arise because concentration is more common in a particular industry which is high-valued, on average. Thus, endogeneity may lead researchers to see a relationship which does not actually exist — a spurious regression, or fail to find a relationship which actually exists. The central issue is to isolate the ownership-performance relation from a complex set of interrelationships.

Since Jensen and Meckling (1976), ownership has been supposed to be a determinant of corporate performance, i.e. the causality runs from ownership to performance. Recent studies argue the causation between ownership and performance could, in some circumstances, run in the opposite direction. Holderness (2003) raises a reverse-causation problem: corporate performance may be a determinant of the ownership structure, but not vice versa. It is conceivable that outside shareholders often choose to reward the insiders for good past performance, such as the performance-based compensation in the form of stock options. Moreover, the insider information may create the incentive for managers to change their holdings according to their expectation of future firm performance (Demsetz and Villalonga, 2001). High performance will therefore lead to higher levels of insider ownership. In contrast, when share prices are high relative to expectations, there are large immediate gains and low expected future gains. Insiders may be more tempted to sell parts of their shares in a particular firm at high share prices due to the high risk and opportunity cost of holdings (Pedersen and Thomsen, 2000). This argument indicates a negative effect of performance on managerial ownership. The theoretical discrepancies have resulted in various empirical methods used to analyze the issues.

### 3.3 Empirical evidence

#### 3.3.1 Managerial ownership as a function of performance

Morck et al. (1988) examine the relationship between management ownership, as measured by the combined stake of all board members, and market value of the firm, as measured by Tobin's Q, for a 1980 cross-section of 371 Fortune 500 firms. To test two hypotheses of the convergence-of-interest and entrenchment, they estimate piecewise linear regressions allowing for slopes to change at two turning points, 5 and 25 percent. The results show that in some ranges of ownership (below 5 percent and over 25 percent), Tobin's Q is positively related to board ownership, but in others, a negative relation is found.

Following Morck et al. (1988), McConnell and Servaes (1990) and Holderness et al. (1999), among others, find significantly inverse U-shaped relationship in the similar way (Figure 1). The results suggest that the convergence-of-interest effect is more important at both low levels and high levels of managerial ownership, but the entrenchment effect is dominant at the medium levels of shareholdings.

#### 3.3.2 Simultaneous equation studies

Recently an ongoing proliferation of research applies the simultaneous equation method to deal with the endogeneity problem of managerial ownership. Cho (1998) introduces investment as an intermediate variable between ownership and corporate value. Based on a sample of 326 Fortune 500 manufacturing firms in 1991, ordinary least squares regression (OLS) results suggest that there are significant non-monotonic relations between ownership and Tobin's Q, and between ownership and investment. To address the endogenous effect, he estimates a 3-equation model simultaneously determining ownership, Q-values and investment (capital and R&D expenditures). The two-stage least squares regression (2SLS) results suggest that investment affects corporate value which, in turn, affects ownership structure, but the effect of ownership on Q becomes insignificant (Table 2).

Demsetz and Villalonga (2001) examine the relationship when ownership is treated as not only an endogenous variable but also an amalgam of shareholdings owned by persons with different interests (the fractions of shares owned by

management and by outside shareholders) for 223 U.S. firms. OLS results suggest that ownership is significant in explaining performance. However, when endogeneity is taken into account, 2SLS results show no effect of ownership on performance (Table 3).

Another way to solve the endogeneity problem of ownership is to use panel data and control fixed individual effect. Himmelberg et al. (1999) argue that both managerial ownership and performance are endogenously determined by exogenous changes in the firms' contracting environment, i.e. observable and unobservable firm characteristics. The unobserved firm heterogeneity may induce a spurious regression. Using unbalanced panel data from the Compustat universe over the period 1982-1992 and controlling both for observed firm characteristics and firm fixed effects, they find no evidence to suggest that managerial ownership affects firm performance. They also explore the use of instrumental variable as an alternative to fixed effects to control the endogeneity of ownership. It is difficult to find suitable instruments that are correlated with ownership, but not with the error terms of equations. Without a more suitable candidate, they select firm size and stock price volatility as instruments and find a significant inverse-U relation between ownership and firm value. However, due to the weakness of the instruments, the evidence of a causal link seems to be tentative.

#### 4. Reasons for discrepancies among previous research

In the field of corporate governance, empirical results appear to provide different, even conflict evidence on the effects of ownership on performance (Appendix). What accounts for such disagreement? We think it may be a result that researchers apply different estimation methods, performance and ownership measures, samples, and more importantly, whether and how they are concerned with corporate governance environments in which firms are embedded.

##### 4.1 Corporate governance environment

One important reason of that the existing evidence fails to establish a convincing link between ownership structure and corporate performance is that the relation may be diverse according to the realities of the corporate governance environment — communities, political environments, cultures and ideologies, industry organization, and more generally financial markets and laws which particular absorb scholars. Comparing across countries, it is useful to distinguish and contrast two categories of national systems of corporate governance: a market-oriented (Anglo-American) system and an insider/control-oriented (European-Japanese) system. Both systems are broadly associated with various developments of financial markets and law systems. Consistent with the section 2.2, empirical studies are likely to show that blockholders have a positive effect on corporate performance in insider-oriented countries, such as Continental Europe and East Asian economies; while the overall impact of blockholders on performance seems to be insignificant in the market-oriented system, such as the USA and UK. This line of reasoning would suggest that ownership structure matters, but its impact is contingent on a specific governance environment. In the market-oriented system, ownership concentration is very low, stocks are frequently traded and shareholder rights are well protected. In principle ownership does no matter much to a company, because management is largely held in check by external forces of market competition and laws/regulations, rather than shareholders. But in the rest of the world, the insider-oriented system, ownership is much more concentrated, many stocks are illiquid and investor protection is weak. Ownership structure is likely to be more important to a company due to the essentiality of shareholders' monitoring role.

A possible failure of existing studies is that they generally ignore the influence of environmental context, especially the extent to which corporate governance environments influence the ownership-performance relation. In a specific economic environment, different ownership (diffused or concentrated) and types of shareholders (stable shareholders or market investors) bring various benefits and costs to firms. The actual trade-off between the benefits and costs is contingent on economic environments. That is, a specific corporate governance environment may determine whether the ownership-performance relation is positive, negative or insignificant. Placing the ownership-performance relation within a broader economic environment may thus yield additional insight into this field.

##### 4.2 Estimation method

Different conclusions regarding the relationship between ownership and performance are partially owing to model specification and estimating technique applied. Endogeneity of ownership structure is the most important reason for the divergent estimates. With the assumption that ownership structure is exogenously determined, a common approach for estimating the relation is single equation of regressing corporate performance on such variables as the percentage of equity ownership. While the single equation studies do not agree upon detailed results, most report significant effects of ownership on performance. However, if ownership is endogenously determined, single-equation estimation will produce biased results. Simultaneous equation models and the instrumental variable regressions will result in better estimates. The equations for the most general case of ownership and performance being jointly determined are as follows:

$$\text{Performance} = f(\text{ownership, financial leverage, firm size, investment, industry, etc.})$$

$$\text{Ownership} = g(\text{performance, firm size, investor protection, risk, liquidity, industry, etc.})$$

It is also possible that there is no systematic relation between ownership and performance at all. A statistically significant relationship found in empirical studies may be attributed to unobservable heterogeneity among firms. Thus, using panel data and controlling for fixed individual effect is a way to solve the endogeneity caused by the spurious relation. However, the methodology is questioned by Zhou (2001) who argues that fixed effects may not allow detecting an effect of ownership on performance even if one exists due to stability of ownership over time.

Contrary to the single equation models, the simultaneous equation models or fixed effect models have generally found the impact of ownership on performance to be insignificant. Whether ownership is an endogenous variable, of course, has important implications as to which method should be used. When securities markets are less liquid, it is difficult for shareholders to alter their portfolios based on the firms' recent performance. Ownership might be exogenous or at least predetermined with respect to performance, and therefore single regression estimates are defensible. When securities markets are well developed and ownership can vary with performance, simultaneous equation models may help overcome the endogeneity problem. Unfortunately, the test for endogeneity of ownership is not clear-cut so far.

#### *4.3 Measurements of corporate performance*

Existing research employs three alternative criteria for performance in corporations. First is a market based measure — Tobin's Q, the market value of the firm over its replacement cost. Since it can provide a viewing window into the firm through the market's valuation of the securities and capture the long-term impacts of corporate actions, Tobin's Q is a well-accepted proxy for firm valuation and widely used in the literature of corporate governance. However, the way in which Tobin's Q is computed suffers from some problems. Demsetz and Villalonga (2001) argue that Q distorts performance comparisons of firms with different intangible capital, because the numerator of Q (market value) partly reflects a firm's intangible assets; but the denominator (replacement cost) includes the firm's tangible assets only. Furthermore, it incorporates Q into accounting artifacts that many studies substitute the depreciated book value of total assets for replacement cost as the denominator of Q.

Secondly, accounting performance measures, such as return on asset (ROA) and return on equity (ROE), are employed in many empirical studies solely or as a complement of Tobin's Q. While primarily accounting information reflects the short-term profitability of the firm's operations, it also induces many problems, including not reflecting all agency costs and long-term returns, easily manipulated by insiders, and affected by accounting practices. Accounting data is not thought as eligible variables in measuring a firm's performance in countries where the accounting standards are imperfect, especially in developing countries.

Finally, productivity analysis is also used to explore the effects of ownership structure on performance. Total factor productivity (TFP), usually based on Cobb-Douglas production function, addresses any effects in total output not caused by capital and labor inputs, and is a general accepted measure of technical efficiency, which is seen as the real driver of long-term growth and forward-looking performance in corporations. It is nature that the studies using different performance measures often present different results.

#### *4.4 Measurements of ownership structure*

A number of studies that came after Demsetz and Lehn (1985) measure concentration of ownership with respect to a group of blockholders, frequently as the fraction owned by the five, ten, or twenty largest shareholders. Earle et al. (2005) contend that the group measure may obscure some important aspects of interactions among large shareholders and the pattern of concentration, which may crucially influence the estimate of the effect of concentration on performance. For example, if a dominant owner presents in a firm, additional small blockholders might make little marginal contributions to monitoring, and serve even to increase costs of concentration. In this situation, measuring concentration by the largest holdings seems to be better than using the joint holdings. Earle et al. (2005) believe that the lack of attention to the limitation of the group measure could explain partially the conflicting findings of previous studies.

Another issue that draws researchers' attention is whether the fraction of shares owned by insiders is the appropriate measure to be representative of the strength or incentives of professional management. Demsetz and Villalonga (2001) argue that a board member, for example, who has large holdings of the company's stock, often has interests identical to those of outside investors, rather than professional management. A large level of management shareholdings, therefore, is not so reliable an index of the ability of professional management to ignore shareholders. Thus, it is especially important that we understand: which is the better measure of incentives to management.

#### *4.5 Data issues*

Discrepancies may arise from data quality, including inconsistent statistical criteria, accuracy, and selection bias. The data from various sources suffers from the inconsistent issue. There is not, for example, a standard definition used for ownership. Kole (1995) compares three widely-used sources for ownership data in the U.S.: proxy statements of corporations (PROXY), Corporate Data Exchange (CDE) Stock Ownership Profiles, and Value Line Investment Survey (VALUE LINE). The three data sources are in considerable disagreement in definition of ownership: "PROXY includes

officers and directors as a group; CDE, all board members that individually are beneficial owners of at least 0.2 percent of their company's equity; and, VALUE LINE reports the 'largest group of shareholders or insiders'." (p.420) Although Kole prove that differences in ownership data cannot explain contradictory empirical evidence, the ownership coefficients in the separate regressions for the same sample from the three data sources are different and their statistical significance varies dramatically.

Dlugosz et al. (2006) highlight that the large shareholder data in Compact Disclosure (CD) Database of Standard & Poor's, a widely used commercial product in the United States, has many mistakes and biases: overlaps, misrepresentation of preferred shares, and other problems. In a representative analysis of outside blockholders and firm value, they find that using the uncorrected blockholder data as an independent variable leads to significant biases for the blockholder coefficients. Thus, if the blockholder effect is the key independent variable, it is necessary to work with "clean" block data.

Furthermore, most studies use data from large enterprises, particularly listed companies, due to the enormous difficulties in collecting data for smaller enterprises. Large enterprises are thus overrepresented in empirical analysis. Kole (1995) demonstrates that divergences in the effect of ownership on performance are attributable to differences in the size of sample firms. Similarly, developed countries, especially the U.S., are overrepresented also because disclosure of information is much less in most developing countries.

## 5. Conclusions and further research

Our reading of the extant literature on the relationship between ownership structure and corporate performance suggests the following conclusions:

- Concentrated ownership is associated with the benefits of better monitoring and the costs of the expropriation by large shareholders. However, in Continental Europe and East Asian economies, with a high average ownership concentration, empirical studies find similar results that blockholders have a positive effect on corporate performance.
- Some empirical research has tended to find that the relationship between firm value and managerial ownership would be inverse U-shaped, suggesting the convergence-of-interest and entrenchment effect of insider ownership. But the effect has tended to become insignificant when attempts are made to control for the endogeneity of ownership structure.
- One important reason for discrepancies among previous research is that the ownership-performance relation varies with the realities of corporate governance environments in which firms are embedded.
- The disagreement is also owing to model specification and estimating technique applied. Single equation models, simultaneous equation models, and fixed effect models report different results, because of their divergence of controlling for the endogeneity of ownership. Moreover, variable measurements and data issues could explain partially the discrepancies.

While much has indeed been learned about the relation between ownership and performance, there are several important areas that need further research. We believe that, in particular, three aspects are required to be understood much better.

One avenue of research would be to more closely examine the endogenous issues. It requires that empirical tests are carefully designed and the results carefully interpreted. While more recent work attempts to control for this endogeneity in one way or another, it is very tentative up to now.

The second vital area of research is to investigate the indirect relationship between ownership and performance via corporate governance mechanisms. Ownership structure has important implications for corporate strategy, e.g. investment decision, takeover, compensation schemes, management successions, dividend policy, and long- or short-term orientation of managers, which in turn, influence corporate performance. Up to now, research has focused on the direct relationship between ownership and performance. It is also of interest to find how owners use the mechanisms to control managerial discretion, and then affect the value of firms.

Finally, further examining the cross-national differences in corporate governance environments will be an interesting topic of research. As mentioned above, the ownership-performance relationship varies across countries and over time. A particular ownership structure that is valuable for one economy may have no impact on another, making it difficult to pick up a definite relation. Thus, it is well worth contextualizing ownership-performance relation within a more comprehensive perspective (Figure 2).

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Appendix:  
Summaries of empirical research on the relationship between ownership structure and corporate performance

Authors	Sample and period	Data source	Performance measurements	Ownership measurements	Methodology	Summary of findings and conclusions
Demsetz and Lehn (1985)	The U.S. 511 firms 1976-80	Compustat, CRSP, CDE	Accounting profit rate	Ownership concentration	Single equation (linear) OLS	No significant relationship between ownership concentration and accounting profit rate
Morck et al. (1988)	The U.S., 371 Fortune 500 firms 1980	Compustat, CDE	Tobin's Q	Board ownership (combined stake of all board members)	Single equation (piecewise linear) OLS	Q first increases, then declines, and finally rises slightly as management ownership rises.
McConnell and Servaes (1990)	The U.S. 1,173 firms for 1976 and 1,093 for 1986	Compustat, VALUE LINE	Tobin's Q	Insider ownership, blockholders, institutional ownership	Single equation (quadratic) OLS	A significant curvilinear effect of insider ownership, a positive effect of institutional ownership, and an insignificant effect of block ownership on Tobin's Q
Cho (1998)	The U.S. 326 Fortune 500 firms 1991	Compustat, PROXY, VALUE LINE	Investment, Tobin's Q	Insider ownership (officers + directors)	3-equation system, 2SLS, OLS (piecewise)	OLS results suggest that ownership affects investment, and then corporate value, while 2SLS results show investment affects corporate value, and then ownership, but not vice versa
Holderness et al. (1999)	The U.S. 1,236 firms in 1935 and 3,759 firms in 1995	SEC, Moody's Manuals, CD	Market-to-book value	Insider ownership (officers + directors)	Single equation (piecewise linear) OLS	The performance-ownership relation for 1935 is inverse U-shaped, while the relation is weaker in 1995 sample
Himmelberg et al. (1999)	The U.S. About 400 Compustat firms (unbalance panel) 1982-92	Compustat; PROXY	Tobin's Q	Managerial ownership (managers + directors)	Fixed effects (quadratic, piecewise) IV	After controlling both for observed firm characteristics and firm fixed effects, there is no evidence to suggest that management affects firm performance
Claessens and Djankov (1999)	The Czech Republic Pooled sample of 2,860 observations (706 firms) 1992-1996	A private consulting firm	Profitability, labor productivity	Ownership concentration (top 5)	Single equation (quadratic) random effects	A 10% increase in concentration leads to a 2% increase in short-term labor productivity and a 3% increase in short-term profitability
Xu Wang and (1999)	China Pooled sample of all listed companies 1993-1995	Publications by CSRC, the SHSE, and SZSE	Market-to-value ratio, ROE, ROA	Concentration (top 5, 10, Herfindahl), different types of shareholdings	Single equation (linear) LSDV	Profitability is positively correlated with concentration and legal person holding, but uncorrelated with state shares and tradable A-shares
Demsetz & Villalonga (2001)	The U.S. 223 firms 1976-80	Demsetz and Lehn study	Tobin's Q	Managerial ownership, concentration	2-equation system, OLS, 2SLS,	OLS results suggest that ownership is significant in explaining performance, 2SLS results show no effect of ownership on performance
Earle et al. (2005)	Hungary 168 firms 1996-2001	Budapest Stock Exchange	ROE, real sales to number of employees (OE)	Concentration (the largest, 2, 3, and all largest blockholders)	Single equation, fixed effects	The size of the largest block increases profitability and efficiency strongly and monotonically



Table 1. Regression results, Demsetz and Lehn: for a sample of 511 U.S. firms 1976-80.

Equation	LA5	LA20	LAH	.....	R <sup>2</sup>
(1)	-0.02 (0.9)				0.10
(2)		-0.004 (0.2)			0.10
(3)			-0.02 (0.9)		0.10

Source: Demsetz and Lehn, 1985, table 9.

The dependent variable is the mean value of accounting profit rate for the 5-year period. LA5, LA20, and LAH are logistic transformation to the percentages of shares owned by top 5 and top 20 shareholders, and to the Herfindahl measure. *t*-statistics are in parentheses.

Table 2. Simultaneous regression results, Cho: for a sample of 326 Fortune 500 firms in 1991.

	Capital expenditures model			R&D expenditure model		
	Insider ownership	Corporate value	Investment	Insider ownership	Corporate value	Investment
Tobin's Q	0.202 (2.67)		0.033 (2.04)	0.188 (2.60)		0.033 (2.87)
INS1		1.087 (0.45)	-0.123 (-1.26)		-1.774 (-0.60)	-0.084 (-0.80)
INS2		0.957 (0.44)	-0.060 (-1.53)		1.370 (0.54)	-0.091 (-0.73)
INS3		1.431 (0.61)	-0.124 (-1.03)		2.613 (0.93)	-0.065 (-0.44)
Investment	-5.377 (-1.01)	22.987 (4.46)		-3.385 (-1.23)	23.614 (3.12)	
.....						
$\bar{R}^2$	0.046	0.171	0.183	0.076	0.189	0.285

Source: Cho, 1998, table 4.

Using 2SLS to estimate the following equations:

Insider ownership =  $f$  (Market value of common equity, Corporate value, Investment, Volatility of earnings, Liquidity, Industry),

Corporate value =  $g$  (Insider ownership, Investment, Financial leverage, Assets size, Industry),

Investment =  $h$  (Insider ownership, Corporate value, Volatility of earnings, Liquidity, Industry).

Definitions of insider ownership (INS1, INS2, and INS3) are similar to Morck et al. (1988) with different breakpoints of 0.07 and 0.38. *t*-statistics are in parentheses.

Table 3. Regression results, Demsetz and Villalonga: for a sample of 223 U.S. firms 1976-80.

Equation	LAvMH	LA5	AvQ	.....	$\bar{R}^2$
(1)AvQ (OLS)	0.0298 (2.14)	-0.0566 (-1.98)			0.36
(2)AvQ (2SLS)	0.0287 (0.47)	-0.0721 (-1.24)			***
(3)LAvMH (OLS)			0.1093 (0.37)		0.36
(4)LAvMH (2SLS)			-2.3916 (-3.21)		***

Source: Demsetz and Villalonga, 2001, table 6.

Ordinary and two-stage least squares regress Tobin's Q (AvQ) and managerial shareholdings (LAvMH) on ownership concentration (LA5), and other control variables. *t*-statistics are in parentheses.

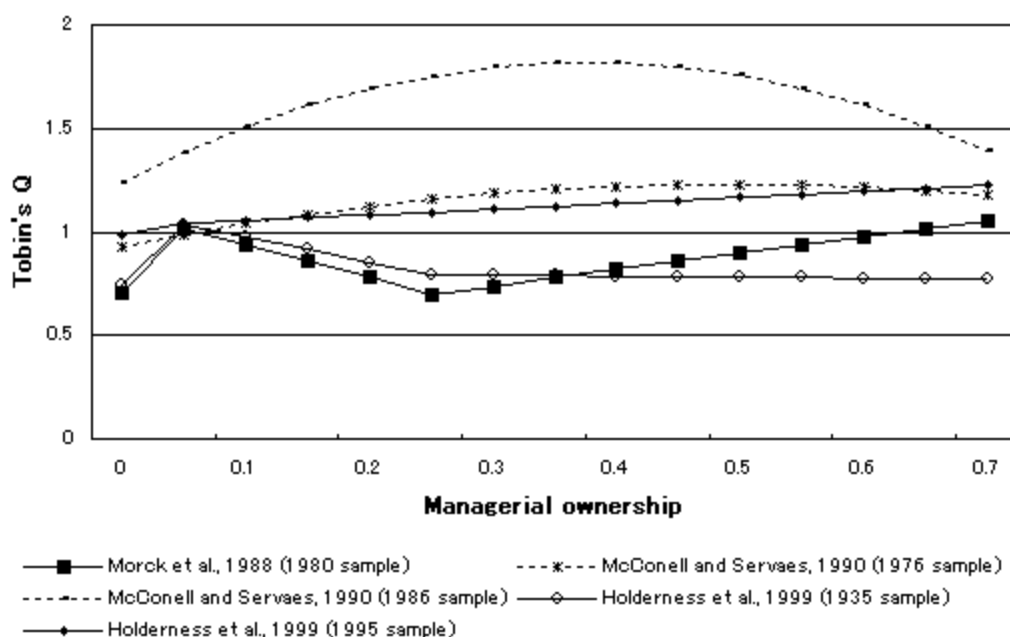


Figure 1. Previous studies of effects of managerial ownership on Tobin's Q

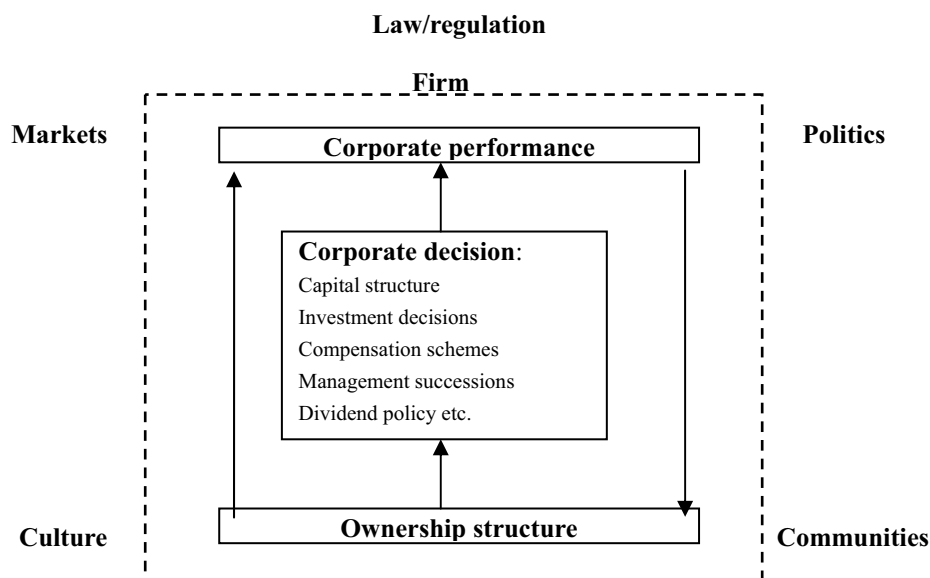


Figure 2. Framework of ownership-performance research