

The Conflict Between Agency Theory and Corporate Control on Managerial Ownership: The Evidence from Taiwan IPO Performance

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ABSTRACT

When a private-held firm goes public through an IPO (initial public offering) process, the managerial ownership of the IPO firm declines due to external equity financing. The effects of dilution of ownership structure on firm performance are different with respect to the agency theory and corporate control theory. For Taiwan IPOs, we argue that the level of managerial ownership of IPO firms at issuance is basically high enough to control the firm. We show that the increase of managerial ownership of IPO firms in the early aftermarket would be hazardous to firm performance. That is, the corporate control benefit dominates the agency costs of IPO firm from the point of view of managerial ownership.

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Keywords: Managerial ownership; Inside ownership; Agency theory; Corporate control; Initial public offerings

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I. INTRODUCTION

The ownership structure of a firm is documented to be influential to its firm performance. Leland and Pyle (1977) argue that the ownership structure is a signal of the firm value. The ownership of a firm consists of managerial ownership, institutional ownership and individual ownership. If we consider the managers or the institutional investors have better understanding about the firm value, the proportion of shares owned by the managers or institutional investors conveys a signal about the value of the firm to the outside investors. Therefore, the stock price reacts to the change of the ownership structure. However, the effect of ownership structure change on the stock performance is undecided. The increase of the managerial ownership should convey a positive signal to the firm value because the benefit of the shareholders is connected to the benefit of insider manager. That is, the agency cost is reduced to raise the firm value when managers own more shares. On the other hand, the increase of the managerial ownership causes the managers to gain more power to control the firm and reduces the chance of being taken over. Firm value should decline if there is no potential raider to challenge the incumbent of the firm.

Morck, Shleifer and Vishny (1988) argue that the effect of managerial ownership on the stock performance depends on the level of managerial ownership. When the managerial ownership is too low to be significant to control over the firm, the increase of managerial ownership facilitates the managers to control the firm and keeps the benefit of managers and outside investors closer. On the other hand, when the level of managerial ownership is high enough to control the firm, the managers do not need extra shares to gain control. Thus, increase of the managerial ownership deteriorates the possibility of outside management to offer a bid to the firm. Therefore, with a low level of managerial ownership, the increase of managerial ownership raises the value of the firm. Nevertheless, with a high level of managerial ownership, the increase of managerial ownership decreases the value of the firm.

Practically, unless the managerial ownership is more than 50% it is difficult to tell whether or not a certain level of managerial ownership is high enough to control the firm. If we can find a specific sample whose managers own enough shares to control the firm, we can then test if the increase of managerial ownership decreases the value of the firm. That is, the loss of benefit of being taken over is greater than the benefit of saving agency cost.

A privately owned company can go public and raise capital through an initial public offering (IPO). Rule 144A imposes a lock-up period for the incumbent shares to be sold to the public.¹ The lock-up period, typically, is 3 years. With the lock-up shares, the incumbent is forced to own enough shares to control the firm at the early stage of issuance. Therefore, the sample of IPO firms provides a good sample to test whether the increase of the managerial ownership decreases the value of the firm. In Taiwan, the initial incumbents experience regulations similar to Rule 144A to lock their initial shares up to three years. In this paper, we examine the conflict between agency cost and corporate control benefit with a sample of Taiwan IPOs.

From the statistic data of Taiwan Stock Exchange (2002), the proportion of securities transactions by foreign institutional investors increases from 0.49% in 1993 to 6.6% in 2002. Obviously, foreign institutional investors become more and more interested in Taiwan securities markets and raise their securities transactions dramatically from 1993 to 2002. Besides, Taiwan stock market has also attracted the interests of the academicians recently such as Chen and Tu (2002), Lang and Lee (1999) and Titman and Wei (1999). Taiwan stock market is considered as the least one on the major Asian stock markets to be affected by the 1997 Asian financial crisis. The crisis starting on July 2, 1997 causes the Thai market to decline by 29.1%, the Malaysia market to decline by 44.5% and the Korean market to decline by 49.5% in the subsequent six months. However, the crisis simply causes Taiwan market to decline by 9.3%. The Asian stock markets except Japan are typically characterized as small capitalization and high volatility.² The Taiwan stock market has been the most volatile market in Asia. Due to the increasing interest of foreign investors and the specific market characteristics, it is important to examine the behaviors of Taiwan securities for the benefit of the international investors.

The remaining of the paper is organized as follows. Section 2 discusses the ownership structure of major East Asian stock markets. In section 3, we present our hypotheses. Data source, variable definition and descriptive statistics are presented in section 4. Section 5 describes the empirical results. Finally, section 6 concludes.

II. THE OWNERSHIP STRUCTURE OF MAJOR EAST ASIAN STOCK MARKETS

This paper examines the ownership structure of Taiwan IPO firms. Taiwan stock market is somewhat different from those of other Asia stock markets. In this section, we analyze the ownership structure of major East Asian stock markets including Japan, Korea, Malaysia, Singapore and Taiwan and report the characteristics of East Asian stock markets in Table 1.

From Table 1, we can see that the proportions of domestic individual investors for the stock markets of Japan, Korea, Malaysia, Singapore and Taiwan are 26.4%, 39%, 17.4%, 15.0% and 58.0%, respectively. Obviously, relative to other East Asian stock markets, Taiwan stock market has more individual investors. Compared to other East Asian stock markets, the proportion of domestic institutional investors (8.1%) in Taiwan stock market is the smallest one. If individual investors are less informed and more sentimental than the institutional investors, we expect that institutional investors are more likely to make money in Taiwan stock markets. In fact, Chang (1998a, 1998b) and Yu and Lai (1999) show that the securities dealers and institutional investors beat the market in Taiwan stock markets. Besides, Taiwanese investors that follow institutional investors' transaction also earn abnormal returns. Table 1 also indicates that less foreign investors invest in Taiwan stock market (7.2% of the investors in Taiwan stock market is foreign investors) relative to other East Asian stock markets of Japan (12.4%), Korea (12.4%), Malaysia (19.6%) and Singapore (10.0%). Hence, the

examination of ownership structure in Taiwan is beneficial to those institutional investors who are seeking a stock market full of unformed individuals.

Table 1
The ownership structure of major East Asia stock markets

	Japan	Korea	Malaysia	Singapore	Taiwan
Domestic individual investors	26.4%	39.0%	17.4%	15.0%	58.0%
Domestic institutional investors	37.0%	13.7%	38.3%	41.0%	8.1%
Domestic non-financial institutional investors	23.7%	17.3%	16.7%	38.0%	26.8%
Foreign investors	12.4%	12.4%	19.6%	10.0%	7.2%

Source: FIBV, Focus, Dec 2000.

Claessens, Djankov and Lang (2000) examine the separation of ownership and control in nine East Asia countries, especially to what extent is the corporate control concentrated in families? They find that in most of East Asia countries, the controlling shareholders (or controlling families) typically gain control by pyramid structure and cross-holding. Separation of management from ownership control is rare. Even though there is a separation between ownership and management, Claessens, Djankov and Lang argue that there is no separation between control and management in East Asia countries.

Claessens, Fan and Lang (2002) investigate the benefits and related agency costs of group affiliations in East Asia countries. A group is a number of firms that are linked through stock-pyramids and cross-ownership. They show that there are gains from group affiliations. Nevertheless, the gains from group affiliations are significantly affected by the agency problem. They also argue that older and slow-growing firms benefit from group affiliations while younger and growing firms suffer from group affiliations.

This paper is other than Claessens, Djankov and Lang (2000) and Claessens, Fan and Lang (2002). Claessens, Djankov and Lang (2000) focus on ownership structure of ownership structure of corporations in East Asia countries while Claessens, Fan and Lang (2002) examine the agency costs resulting from group affiliations of firms in East Asia countries. This paper examines the relationship between ownership structure and stock performance with a sample of Taiwan IPOs. Claessens, Djankov and Lang (2000) do not examine the effect of ownership on firm performance. On the other hand,

Claessens, Fan and Lang (2002) use a sample of firms long after IPOs (the average years since IPOs is 24.82). Therefore, firms in the sample of Claessens, Fan and Lang (2002) are not subject to any limitation on selling shares and are subject to lose control when facing with takeover threat from outside raiders. The reason why this paper uses IPO sample in the early aftermarket is to investigate a sample of firms free of threat of takeover.

III. HYPOTHESES

From a theoretical point of view, Shleifer and Vishny (1986) argue that large shareholders have an incentive to monitor managers for their own interests. They regard the existence of large shareholders as a monitoring mechanism on the behaviors of managers and argue that the presence of large stockholders is good for the value of the firm. Bathala, Moon and Rao (1994) and Seetharaman, Zane and Bin (2001) also support the claim that institutional investors play an important role in monitoring the activities of management and in reducing agency problems. Therefore, we hypothesize that

Hypothesis 1: The increase of institutional ownership is positively related to IPO stock performance.

Managerial ownership structure is related to the firm performance. However, the effect of managerial ownership structure on firm performance is twofold. Agency cost theory and corporate control theory examine the relationship between the ownership structure and firm performance from different angles. Jensen and Meckling (1976) formulate the agency problem that arises when managers own only parts of the ownership of the firm. The partial ownership causes the manager to exploit the outside ownership of the firm. Hence, the partial ownership decreases the value of the firm. Leland and Pyle (1977) show that the managerial ownership is a signal to convey the information of firm value to the outsiders. Basically, the agency theory and signaling hypothesis argue that the higher the managerial ownership, the higher the value of the firm. Oswald and Jahera (1991), Makhija and Spiro (2000) and Cole and Mehran (1998) find evidence to support the positive relation between share value and managerial ownership.

On the other hand, Jensen and Rubuck (1983) indicate that managerial entrenchment implies that the higher the managerial ownership the lower the value of the firm. Stulz (1988) argues that the incumbents are typically against hostile takeover. The premium of hostile takeover would be able to raise the value of share of target firms. Therefore, hostile takeover benefits the target shareholders. If managerial ownership is raised to be high enough to get rid of hostile takeover, the firm value decreases. Israel (1992) and Stulz, Walking and Song (1990) also indicate that the high enough managerial ownership will decrease the possibility of a tender offer by raiders. Typically, a tender offer would benefit the shareholders of the target firm and increase

the value of the firm. With respect to corporate control theory, the managerial ownership will hurt the wealth of outside shareholders and decrease the value of the firm.

Prior studies basically focus on the relation between initial performance of IPOs and IPO ownership structure. Grinblatt and Hwang (1989) and Filatotchev and Bishop (2002) show that firm's equity retained by the insiders conveys a positive signal to the market and thus reduces the extent of underpricing of IPOs. Nevertheless, the relation between ownership structure and IPO long-run performance attracts little attention. Goergen (1998) examines ownership of German IPOs and its impact on IPO long-run performance. Goergen (1998) argues that IPO long-run underperformance cannot be attributed to the agency conflicts caused by the reduction in original stockholders' ownership. Schurmann and Korfgan (1997) and Ehrhardt and Nowak (2003) provide evidence that even years after IPOs, the founding owners in Germany still keep considerable corporate control. Ehrhardt and Nowak (2003) also point out that a high concentration of voting rights in German IPOs leading to poor IPO long-run performance.

With the costs and benefits of managerial ownership, the relationship between firm value and managerial ownership is not linear. At a low level of managerial ownership, the increase of managerial ownership improves the firm value. Nevertheless, at a high level of managerial ownership, the increase of managerial ownership decreases the value of the firm. However, it is difficult to tell whether a level of managerial ownership of a certain firm at a certain time is high or low. As in Germany, Taiwan IPOs are the firms just offered to the public and their managerial ownership is generally locked up to 3 years. Therefore, we argue that the managerial ownership of an IPO firm in the early aftermarket is at a high level. Consistent with Ehrhardt and Nowak (2003) and Goergen (1998), we argue that the increase of managerial ownership of IPO firms would hurt the value of the firms and the non-linear relationship between the managerial ownership and firm value should not exist which leads to the hypotheses below.

Hypothesis 2: The increase of ownership of board of directors is negatively related to IPO stock performance.

Hypothesis 3: The relationship between ownership of board of directors and IPO stock performance is monotonic and without piecewise effect.

Aggarwal and Rivoli (1990) examine the one-year holding period returns and the one-year aftermarket returns of IPOs and find that the long-run performance of IPOs is worse than the market performance. Aggarwal and Rivoli argue that the IPO long-run underperformance may be due to fads or speculative bubbles in the early aftermarket stage.

Ritter (1991) shows that the average three-year holding period returns of IPOs are worse than the returns of market indices and the returns of the matching firms. Aggarwal and Rivoli (1990) and Ritter (1991) argue that the negative long-run

performance of IPOs may be attributed to fads in the IPO market. Jain and Kini (1994) and Mikkelsen, Partch and Shah (1997) indicate that a significant decline in operating performance is found in the IPO aftermarket. Obviously, the poor operating performance should influence the performance of IPO share in the stock market. We therefore propose the following hypothesis.

Hypothesis 4: There is a positive relationship between IPO operating performance and its stock performance in the early aftermarket.

IV. DATA SOURCE, VARIABLE DEFINITION AND DESCRIPTIVE STATISTICS

Data for this paper consists of initial public offerings issued in Taiwan collected from the Status of Securities Listed on Taiwan Stock Exchange over the period from 1992 to 1999. Since we focus on the relationship between the performance of IPOs and the IPO managerial ownership within three years after issuance, the IPO firms in the sample must exist long enough (3 years) for evaluation. Thus, IPOs issued after 1996 and IPOs delisted from the exchange within three years after issuance are deleted from the sample. Furthermore, IPOs requiring full delivery are excluded from the sample.³ Our final sample consists of 133 IPOs. The ownership of board of directors at issuance, offer price, number of shares offered, offer date, auditor and underwriter of issuance are collected from the prospectus of IPO firms. The IPO returns, return on assets (ROA), ownership of board of directors, and institutional ownership⁴ after issuance are downloaded from TEJ (Taiwan Economic Journal) database.⁵

IPO initial return is typically measured by day one return of the IPO. However, due to price limit in Taiwan stock market, day one return is not enough to measure IPO initial return. Instead, we define IPO initial return by the first trading price not hitting the price limit as follows.⁶

$$R_1 = \frac{P_s - P_0}{P_0} \quad (1)$$

where, R_1 is the IPO initial return; P_s is the first IPO market price not hitting the price limit; P_0 is the IPO offer price.

The age of an IPO firm is defined as the number of years from the establishment date of the firm to the offer date. The establishment date of a firm is reported in the preliminary prospects of an IPO. Ritter (1991) indicates that the age of an IPO may be related to the risk level of the firm. Furthermore, an older IPO firm may have more information revealed to the public before issuance. Therefore, the age of an IPO would influence the pricing of the IPO share, transaction price in the right aftermarket and thus the initial return.

The closing prices after issuance, the transaction prices of all other securities and the daily returns of securities are collected from the TEJ database. The 90-day T-

bill rate is employed as a proxy for the riskless rate. Further, we use the Taiwan Stock Index (TAIEX) return as the market return. The data of T-bill rates and TAIEX returns are also provided by TEJ.

We calculate the returns of IPO firms over three years after issuance to measure the value or the performance of IPOs. Fama and French (1993) and Carhart (1997) show that a multi-factor model explain the expected returns of assets more accurately than the traditional market model. In this paper, the performance of IPOs over three years after issuance is measured by Jensen's alpha under the Carhart (1997) model. Explicitly, the IPO performance with initial return is measured by the following regression:

$$R_{it} - R_{ft} = \alpha_{iT} + \beta_{iT}[R_{mt} - R_{ft}] + s_{iT}SMB_t + h_{iT}HML_t + m_{iT}MOMENTUM_t + \varepsilon_{it}, t=1, 2, \dots, T \quad (2)$$

where α_{iT} is the intercept term of the regression, which is also known as the Jensen's alpha under Carhart model (hereafter, Carhart α) measuring the performance of IPO_i from issuance to the Tth day after issuance; SMB_t is the size risk premium; HML_t is the book-to-market risk premium; $MOMENTUM_t$ is the factor-mimicking portfolio for the six-month momentum of stock returns. The market factor is simply the market return measured by the TAIEX return. For the size factor, and the book-to-market factor, we mimic the procedure of forming portfolios proposed by Fama and French (1993).⁷

The IPO performance without initial return is measured by the following regression:

$$R_{it} - R_{ft} = \alpha_{isT} + \beta_{isT}[R_{mt} - R_{ft}] + s_{isT}SMB_t + h_{isT}HML_t + m_{isT}MOMENTUM_t + \varepsilon_{it}, t=s, s+1, s+2, \dots, T \quad (3)$$

where α_{isT} is the Carhart α measuring the performance of IPO_i from day s to day T after issuance. Day s is the first day with trading price not hitting the price limit on that day.

Carter and Manaster (1990) point out that IPOs underwritten by prestigious underwriters are less risky and their initial returns are smaller than those underwritten by non-prestigious underwriters. Furthermore, Carter, Dark and Singh (1998) also show that IPOs by prestigious underwriters experience better long-run performance. In this paper, we argue that the prestigious underwriters likely will underwrite more and larger offerings than non-prestigious underwriters. Therefore, we measure underwriter prestige by calculating the market share of the underwriter based on IPO proceeds from 1992 to 1996. We form a measure for underwriter prestige as follows:

$$\text{Underwriter prestige} = \frac{\sum_{i=1}^{n_j} \text{proceeds}_i}{\text{Total IPO proceeds issued from 1992 to 1996}} \quad (4)$$

where proceeds_i is the product of offer price and the number of shares offered for IPO_i; n_j is the number of IPOs in the sample underwritten by underwriter j .

Beatty (1989) argues that prestige of auditors conveys information about the risk characteristics of IPOs. Similar to the measure for underwriter prestige, we define auditor prestige by measuring the market shares of the auditor in the IPO market. Variable definition is reported in Table 2.

Table 2
Definition of variables

Variable	Description
Initial return	(The first market price of an IPO when not hitting the price limit – offer price) / offer price
Initial market return	(market index on the first day when the IPO price does not hit the price limit – market index on offer date) / market index on offer date
Proceeds (Million NT dollars)	The product of the offer price and the number of shares offered on an IPO.
Age	Years from the established date to offer date of an IPO.
Carhart α with initial return	The intercept term of $R_{it} - R_{ft} = \alpha_{iT} + \beta_{iT}[R_{mt} - R_{ft}] + s_{iT}SMB_t + h_{iT}HML_t + m_{iT}MOMENTUM_t + \varepsilon_{it}, t = 1, 2, \dots, T$
Carhart α without initial return	The intercept term of $R_{it} - R_{ft} = \alpha_{isT} + \beta_{isT}[R_{mt} - R_{ft}] + s_{isT}SMB_t + h_{isT}HML_t + m_{isT}MOMENTUM_t + \varepsilon_{it}, t = s, s+1, s+2, \dots, T$ <p>Day s is the first day that IPO price does not hit the price limit.</p>
Level change of ownership of board of directors	(Board of directors ownership at year 3) – (Board of directors ownership at year 0).
Percent change of ownership of board of directors	(Board of directors ownership at year 3) / (Board of directors ownership at year 0).
Level change of institutional ownership	(Institutional ownership at year 3) – (Institutional ownership at year 0).
Percent change of institutional ownership	(Institutional ownership at year 3) / (Institutional ownership at year 0).
A	The cut-off point of piecewise regression.
D	Dummy variable; D=1 if ownership > the cut-off point, D=0 otherwise.
Industry change of ownership	The industry average of level change or percent change of institutional ownership and ownership of board of directors.
ROA	The average Return on Assets during the first three years of an IPO.
Auditor reputation	The market share of the auditor for an IPO.
Underwriter prestige	The market share of the lead underwriter for an IPO.

In Table 3, we provide the descriptive statistics of the IPO characteristics. Table 3 shows that the mean initial return of IPOs in Taiwan is 38.389% (with median of 29.410%). These findings are quite different from the previous findings related to IPOs issued in U.S. Ibbotson and Ritter (1995) indicate that IPOs in U.S. experience huge initial return, however, with median close to zero. The mean market return compared to IPO initial return is 0.297%. Thus, the IPO investments earn 38.092% more than the market. The average proceeds of IPOs in the sample is 430 million NT dollars (medium=380 million), and thus we have positive skewed IPOs proceeds size. Before issuance, Taiwan IPOs have been existed for 18.038 years on average. That is, IPOs in Taiwan could be well-known to the public at issuance.⁸ The average 3-year long-run

performance excluding initial returns is -11.743%. That is, IPOs in Taiwan also experience poor long-run performance as documented in US market.⁹ The ownership of board of directors declines by 5.8%. However, the institutional ownership slightly decreases by 0.4%. The magnitude of decline of ownership of board of directors is significantly larger than that of institutional ownership. If we assume that the institutional investors are sophisticated enough to detect the performance of the IPO firms, the institutional investors will reduce their holdings once they expect that the value of IPO firms will decline. If the decrease of ownership of board of directors is harmful to the firm value, the institutional investors will reduce their ownership to avoid the decline of firm value due to agency costs resulting from the drop of managerial ownership (Jensen and Meckling, 1976). Therefore, the insignificant decline of institutional ownership along with significant decline of ownership of board of directors implies that the agency costs resulting from the decline of ownership of board of directors are not severe. The average ROA of IPO firms is 0.951% which is close to the median 0.960%. The average market shares of the auditor and lead underwriter are 9.5% and 10.1%, respectively.

V. EMPIRICAL RESULTS

The paper examines the potential agency problem and the corporate control associated with ownership structure of the IPO firms. Basically, a high level of managerial ownership and/or the institutional ownership is good for reducing agency costs of the firms. However, the high level of managerial ownership also reinforces the corporate control of the incumbent and hurts the potential offers of outside raiders. We examine the relationship between the stock performance and the institutional ownership and the relationship between stock performance and managerial ownership.

Table 3
Descriptive statistics

Descriptive statistics for the IPO initial return, initial market return, performance, ownership, proceeds, age, auditor reputation and underwriter prestige. Our data consist of 133 IPOs issued in Taiwan from 1992 to 1996.

	Mean	Standard deviation	Maximum	Median	Minimum	T-value
Initial return	38.389%	32.484%	165.74%	29.410%	-23.580%	14.901
Initial market return	0.297%	7.378%	25.125%	0.658%	-8.960%	0.528
Proceeds (Million NTS)	430	493	3737	380	107	10.055
Age	18.038	8.703	43	17	5	23.901
Carhart α with initial return	26.370%	71.040%	270.910%	16.230%	-135.16%	4.280
Carhart α without initial return	-11.743%	70.767%	229.320%	-21.711%	-149.575%	-1.914
Level change of ownership of board of directors	-5.80%	9.9%	8.8%	-3.2%	-91.5%	-6.724
Percent change of ownership of board of directors	73.3%	35.8%	211.0%	72.9%	0.1%	23.594
Level change of institutional ownership	-0.004%	0.176%	0.525%	0.001%	-0.459%	-0.262
ROA	0.951%	2.045%	6.300%	0.960%	-6.670%	5.360
Auditor reputation	9.5%	6.8%	22.7%	9.5%	0.1%	16.176
Underwriter prestige	10.1%	8.4%	25.7%	5.1%	0.2%	13.734

A. The stock performance and institutional ownership

Pound (1988) and McConnell and Servaes (1990) show that the institutional investors own better monitoring power over the firm. The institutional ownership also serves as a signal for the value of the firm. Therefore, we expect that the higher the institutional ownership, the better the stock performance. The 3-year after issuance stock performance is measured by the α in equations (2) and (3). The control variables consist of the reputation of auditor, the reputation of underwriter, IPO proceeds, age of IPO firm at issuance, and the IPO initial returns. These control variables are known as influential factors for IPO stock performance. Our result of the relationship between stock price and institutional ownership is reported in Table 4. From columns 1 and 2 of Table 4, we can see that no matter the stock performance is measured with or without its initial return, both the level change and percent change of institutional ownership are significantly and positively related to stock performance. Panel A of Table 4 reports the coefficient and p-value of level change of institutional ownership on Carhart α with initial return is 0.942 and 0.073, respectively; the coefficient and p-value of percent change of institutional ownership on Carhart α with initial return is 0.558 and 0.031, respectively. Panel B of Table 4 reports the relation between ownership structure and stock performance measured by Carhart α without initial return. Panel B of Table 4 also shows that the increasing of institutional ownership raises IPO stock performance. Our result is consistent with the agency theory arguing that the stronger the outside monitoring power, the higher the value of the firm.

For the control variables, we find that age of issuing firm is negatively related to IPO three-year performance after issuance while IPO initial return is positively related to its three-year performance. Basically, the older firms will be less risky in operations and thus the price performance of stock is more stable also. Therefore, we find a negative relationship between age and IPO performance. Ritter (1991) shows that IPO initial return is negatively related to its long-run performance due to speculative bubbles or fads. Table 4 indicates that initial returns are positively related to long-run performance including initial returns but negatively related to long-run performance excluding initial returns. These results imply that the initial return dominates the long-run performance and that fads exist in IPO early aftermarket.

B. The stock performance and ownership of board of directors

Agency theory and signaling hypothesis argue that the increase of the managerial ownership is good to the value of the firm leading to a positive stock price reaction. The corporate control theory is against the implication of agency theory and signaling hypothesis, and implies that the high level of ownership of managers deteriorates the firm value. Morck, Shleifer and Vishny (1988) show that there is a non-linear relationship between managerial ownership and firm value. When the managerial ownership is at a low level, the managerial ownership is positively related to its firm value. On the other hand, when the managerial ownership is at a high level, the

managerial ownership is negatively related to its firm value. From a sample of Taiwan IPOs, we argue that the level of managerial ownership of IPOs in the early aftermarket is high enough to get rid of potential threat of being taken over due to the lock-up period of IPO shares. Thus, the increase of managerial ownership is harmful to the value of the firm. Therefore, the increase of managerial ownership leads to a decline in stock price.

Columns 3 and 4 of Table 4 report the relationship between the IPO stock performance and the change of ownership of board of directors with several control variables. The ownership of board of directors of the IPO firm is the proxy variable for managerial ownership.

Table 4
The relation between stock performance and ownership structure

The relation between stock performance measured by Carhart α and ownership of board of directors and the relation between stock performance and institutional ownership controlling for auditor reputation, underwriter prestige, proceeds, age and initial return. In the parentheses are the p-values. *, ** and *** represent the significance levels of 10%, 5% and 1%, respectively.

Panel A: Carhart α is measured with initial return				
Intercept	270.847 (0.069)*	230.816 (0.119)	224.398 (0.125)	345.869 (0.041)**
Level change of ownership of institutional investors	0.942 (0.073)*			
Percent change of ownership of institutional investors		0.558 (0.031)**		
Level change of ownership of board of directors			-239.825 (0.037)**	
Percent change of ownership of board of directors				-9.812 (0.070)*
Industry change of ownership ¹	-0.525 (0.318)	-1.617 (0.073)*	307.569 (0.305)	-75.344 (0.216)
Auditor reputation	-36.158 (0.776)	18.435 (0.885)	-4.146 (0.973)	0.147 (0.999)
Underwriter prestige	62.128 (0.475)	66.054 (0.451)	91.397 (0.289)	65.181 (0.452)
Ln(proceeds)	-18.044 (0.116)	-15.577 (0.171)	-14.630 (0.203)	-19.407 (0.107)
Age	-1.718 (0.051)*	-1.750 (0.045)**	-1.750 (0.042)**	-1.833 (0.035)**

Table 4 (continued)

Initial return	0.787 (0.069)*	0.725 (0.089)*	0.659 (0.042)**	0.734 (0.084)**
R ²	0.146	0.160	0.174	0.153
Adjusted R ²	0.072	0.086	0.102	0.079
Pr>F	0.071	0.014	0.026	0.055
N	110	110	133	133
Panel B: Carhart α is measured without initial return.				
Intercept	268.913 (0.077)*	225.325 (0.135)	222.030 (0.137)	350.425 (0.043)**
Level change of ownership of institutional investors	1.142 (0.067)*			
Percent change of ownership of institutional investors		0.615 (0.028)**		
Level change of ownership of board of directors			-241.010 (0.040)**	
Percent change of ownership of board of directors				-7.894 (0.076)*
Industry change of ownership ¹	-0.499 (0.353)	-1.671 (0.067)*	284.248 (0.353)	-80.832 (0.194)
Auditor reputation	-33.216 (0.798)	25.969 (0.843)	0.977 (0.993)	2.706 (0.983)
Underwriter prestige	55.263 (0.534)	60.476 (0.499)	84.641 (0.337)	57.898 (0.513)
Ln(proceeds)	-17.828 (0.128)	-15.137 (0.193)	-14.521 (0.216)	-19.477 (0.113)
Age	-1.695 (0.060)*	-1.707 (0.055)*	-1.711 (0.052)*	-1.805 (0.042)**
Initial return	-2.227 (0.060)*	-0.290 (0.050)*	-0.355 (0.040)**	-2.286 (0.051)*
R ²	0.098	0.115	0.126	0.107
Adjusted R ²	0.049	0.074	0.089	0.059
Pr>F	0.088	0.001	0.034	0.086
N	110	110	133	133

¹ Industry change of ownership is the industry average change of the corresponding independent variable used in the regression. For example, when level change of ownership of institutional investors is employed as an independent variable in the regression the industry change of ownership means the industry average level change of ownership of institutional investors.

Table 4 indicates that the increase of ownership of board of directors will decrease the IPO stock performance. The p-values of level change of board ownership and percent change of board of directors' ownership are 0.037 and 0.070, respectively when Carhart α measured with initial return. These results imply that the agency cost with respect to the managerial ownership is not as serious as corporate control benefit.

C. The agency cost and corporate control benefit of ownership of board of directors

Morck, Shleifer and Vishny (1988) argue that the relationship between managerial ownership and firm value should be non-linear due to the agency cost and corporate control benefit of managerial ownership. In this paper, we argue that for IPO firms, incumbent managers at the stage of early aftermarket own high enough control over the firms. Since the incumbents already own enough shares to control over the firms, increasing managerial ownership is not helpful to gain control. Instead, the decreasing managerial ownership offers the potential raiders a higher chance to take over the firms. According to the corporate control theory such as Stulz, Walking and Song (1990), the existence of threat of being taken over increases the value of the firm. On the other hand, from the point of view of agency theory, the managers of IPO firms already own the majority of the outstanding shares and thus the benefit of IPO managers is close to the benefit of the firms. Furthermore, IPO lock-up period prevents the managers from selling many shares and thus the decline of managerial ownership is not enough to dispatch the connection between the managers and the IPO firm. The decline of managerial ownership will not cause enough agency costs to hurt the value of the IPO firms. Since the effect of agency cost will be overcome by corporate control effect, there should be no piecewise relationship between managerial ownership and the stock performance in IPO firms. We apply the following piecewise regression to examine the linearity of the relationship between the stock performance and the managerial ownership.

$$\begin{aligned} \text{Performance} = & \beta_0 + \beta_1 \text{Ownership} + \beta_2 D(\text{Ownership} - A) + \beta_3 \text{Industry} \\ & + \beta_4 \text{Auditor} + \beta_5 \text{Underwriter} + \beta_6 \text{Proceeds} + \beta_7 \text{Age} \\ & + \beta_8 \text{Initial return} + \varepsilon \end{aligned} \quad (5)$$

where Performance=stock performance measured by 3-year Carhart α with initial return; Ownership=managerial ownership measured by proportion of shares owned by board of directors; D=1 if ownership>A, D=0 otherwise; A=the turning point of the piecewise regression for the managerial ownership; Industry=industry average of ownership; Auditor=auditor reputation measured by market share of auditors; Underwriter=underwriter prestige measured by market share of underwriters; Proceeds=IPO proceeds; Age=age of IPO firm; and Initial return=initial return of IPO firm.

Table 5

The linearity between stock performance and ownership of board of directors

The piecewise relation between stock performance measured by Carhart α and ownership of board of directors controlling for auditor reputation, underwriter prestige, proceeds, age and initial return. The average decline of ownership of board of directors is 0.05. In the parentheses are the p-values. *, ** and *** represent the significance levels of 10%, 5% and 1%, respectively.

	Carhart α with initial return			
	A= -0.10	A= -0.05	A= -0.03	A= -0.01
Intercept	204.258 (0.163)	221.817 (0.129)	221.952 (0.130)	226.670 (0.123)
Level change of ownership of board of directors	-506.774 (0.050)**	-356.950 (0.031)**	-292.005 (0.041)**	-224.286 (0.069)*
$D_i \tilde{N}$ (Ownership-A)	490.929 (0.247)	422.887 (0.317)	320.841 (0.535)	-239.815 (0.724)
Industry change	252.016 (0.405)	250.991 (0.410)	257.774 (0.408)	346.205 (0.281)
Auditor reputation	-11.034 (0.928)	-16.571 (0.894)	-8.996 (0.942)	-6.109 (0.961)
Underwriter prestige	93.314 (0.278)	100.858 (0.245)	95.720 (0.271)	90.442 (0.297)
Ln(Proceeds)	-16.687 (0.151)	-15.954 (0.168)	-15.239 (0.188)	-14.430 (0.212)
Age	-1.735 (0.044)**	-1.748 (0.042)**	-1.728 (0.046)**	-1.783 (0.041)**
Initial return	0.656 (0.098)*	0.685 (0.100)*	0.676 (0.093)*	0.659 (0.097)*
R^2	0.187	0.184	0.178	0.172
Adj R^2	0.105	0.101	0.094	0.092
	Carhart α with initial return			
	A= -0.10	A= -0.05	A= -0.03	A= -0.01
Pr>F	0.029	0.033	0.041	0.045
N	133	133	133	133

Table 5 reports the piecewise regression of stock performance on the board of directors' ownership to capture the non-linearity of the relationship. In Table 5, we try several cut off points for piecewise regression. The average decline of ownership of board of directors is 0.05. The cut off points are in the range of -0.10 to -0.01 because the ownership of board of directors of IPO firms typically declines after issuance. The significance of the cut off points for -0.10, -0.05, -0.03 and -0.01 is 0.247, 0.317, 0.535 and 0.724, respectively. None of the cut off points is significant implying that there doesn't exist a piecewise relationship between managerial ownership and firm value for the IPO firms. Morck, Shleifer and Vishny (1988) argue that when both agency cost and corporate control benefit are both significant for firm value, there should exist a piecewise relationship between the managerial ownership and the value of the firms. Therefore, our results support our argument that for the IPO firms the agency cost is less significant than corporate control benefit. We find that the higher the managerial ownership, the lower the stock performance and that no piecewise relationship between managerial ownership and firm value.

Claessens, Fan and Lang (2002) find that agency problems are important explanatory factors of firm value in East Asia countries except for Japan. Our result is somewhat different from that in Claessens, Fan and Lang (2002) because we use a sample of firms within 3 years after IPOs. Due to the regulation of IPO lock-up period, our sample firms are basically free of threat of takeover. On the other hand, sample firms in Claessens, Fan and Lang (2002) consist of firms long after IPOs (the average year since IPOs is 24.82). Moreover, our finding is consistent with Goergen (1998). Goergen (1998) shows that the long-run performance of German IPOs cannot be explained by agency conflicts. Similar to our sample firms, the founding owners of German IPOs still gain considerable corporate control over 10 years after IPOs (Ehrhardt and Nowak, 2003).

D. The operating performance and stock performance

Obviously, the operating performance should be positively related to the stock performance. Jain and Kini (1994) and Mikkelsen, Partch and Shah (1997) show that the decline of operating performance of IPOs is related to the decline of the IPO stock performance. In this paper, we also examine the relationship between the operating performance and stock performance. The stock performance is measured by two variables: Carhart α with initial return and Carhart α without initial return. Table 6 indicates that the operating performance is positively related to the stock performance. No matter an investor purchases IPO share from the primary market or the secondary market, he will make more profit if the IPO firms experience better operating performance. Our results are consistent with Jain and Kini (1994) and Mikkelsen, Partch and Shah (1997).

Table 6
The relation between stock performance and operating performance

The relation between stock performance measured by Carhart α and operating performance measured by ROA controlling for auditor reputation, underwriter prestige, proceeds, age and initial return. In the parentheses are the p-values. *, ** and *** represent the significance levels of 10%, 5% and 1%, respectively.

	Carhart α with initial return	Carhart α without initial return
Intercept	89.025 (0.393)	85.171 (0.419)
ROA	12.680 (0.000)***	12.788 (0.000)***
Auditor reputation	-85.317 (0.336)	-77.952 (0.384)
Underwriter prestige	60.490 (0.382)	57.268 (0.413)
Ln(Proceeds)	-4.042 (0.613)	-3.852 (0.634)
Age	-2.018 (0.002)***	-1.958 (0.004)***
Initial return	0.768 (0.030)**	-0.227 (0.052)*
R ²	0.239	0.195
Adj R ²	0.202	0.157
P>F	0.000	0.000
N	133	133

VI. CONCLUSION

The managerial ownership is related to the value of the firm and thus the stock performance. However, the effect of managerial ownership on stock performance is two fold. The agency cost theory and signaling hypothesis point out that the managerial ownership is good for stock performance. On the other hand, the corporate control theory argues that the managerial ownership is harmful to the stock performance. With the two-fold effect of managerial ownership on stock performance, previous research argues that the relationship between managerial ownership and stock performance is nonlinear. Similar to German IPOs, the original owners of Taiwan IPOs still control over the firms three years after going public. In this paper, we argue that for the sample of Taiwan IPOs the level of managerial ownership during the IPO lock-up period is

high enough to control the firm. The effect of managerial ownership on IPO stock performance should be in a single direction. Consistent with Ehrhardt and Nowak (2003), our results show that the increase of managerial ownership of IPO firms decreases their stock performance. Furthermore, there is no non-linear relationship between managerial ownership and stock performance. With Taiwanese IPO sample, we find that corporate control effect dominates the agency effect or signaling effect of managerial ownership. Our results do not rule out the effect of agency costs resulting from managerial ownership. Nevertheless, we argue that at a high level of managerial ownership the agency cost is not significant related to the managerial ownership which is consistent with the finding of Goergen (1998).

ENDNOTES

1. Rule 144A is a US SEC rule issued in 1990 that modified a two-year holding period requirement on privately placed securities by permitting large institutions to trade these positions among themselves.
2. See Bessembinder and Chan (1995), Bailey, Stulz and Yen (1990), Pan, Chiou, Hocking and Rim (1991) and Rhee, Chang and Ageloff (1990).
3. In Taiwan, stocks requiring full delivery are the firms in financial distress. Original sample size is 136 IPOs issued from 1992 to 1996. 3 out of 136 require full delivery and thus are deleted from the sample. Typically, shares requiring full delivery perform poorer than ordinary shares.
4. Institutional ownership reported in TEJ consists of government ownership, financial institution ownership, mutual funds and qualified foreign institution investors' ownership.
5. TEJ data base is the most popular academic research base for finance and accounting in Taiwan.
6. A stock traded in Taiwan stock market on each trading day is subject to a 7% price limit based on its preceding closing price.
7. Please refer to Appendix for the details of forming SMB, HML and MOMENTUM.
8. Ritter (1991) indicates that the average age of IPOs in U.S. is 6 years old.
9. See Ritter (1991) for more details.

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APPENDIX

Calculations of SMB, HML and MOMENTUM

SMB_t in equations (2) and (3) is the portfolio of risk premium of size factor. SMB_t is measured by the following procedure:

1. Sort the sample of all stocks traded in Taiwan Stock Exchange based on their size (market value) on day t . The market value on day t is the product of stock price and the number of shares outstanding on that day. The bottom 30 percent of stocks are classified as the small size group. The top 30 percent of stocks are defined as the large size group. The market value of stocks can be collected from TEJ data base.
2. Calculate the SMB_t as the average return of small size stocks minus the average return of large-size stocks on day t .

Further, HML_t in equations (2) and (3) is the portfolio of risk premium of book-to-market related factor. $HML_{(q,s)}$ is measured as follows:

1. Sort the sample of all stocks traded in Taiwan Stock Exchange based on their book-to-market ratio on day t . The book value on day t is measured by the book value of the stock at the end of the preceding year. The stocks with book-to-market ratio smaller than the median book-to-market ratio belong to the group of stocks with low book-to-market ratio. The other stocks are classified as the group of stocks with high book-to-market ratio. The book value of a stock is available from TEJ data base.
2. Calculate HML_t as the average return of high book-to-market stocks minus the average return of low book-to-market stocks of day t .

$MOMENTUM_t$ in equations (2) and (3) is measured by the following procedure:

1. Sort the sample of all stocks traded in Taiwan Stock Exchange based on their prior six-month holding period return on day t . The prior six-month holding period return on day t is measured from the window period from 180 days before to one day before the day, i.e. (-180, -1). The stocks with prior six-month holding period return smaller than the median of the holding period return are classified as the low-momentum group; others as the high-momentum group.
2. Calculate the $MOMENTUM_t$ as the average return of high-momentum stocks minus the average return of low-momentum stocks on day t .

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