DOES MULTI-DIMENSIONAL OWNERSHIP STRUCTURE MATTER IN FIRM PERFORMANCE? A DYNAMIC FIRM'S LIFE CYCLE PERSPECTIVE

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ABSTRACT

Prior studies on the relationship between ownership and firm performance have produced mixed results; hence, this paper re-examines the relationship using an unbalanced panel pooled sample of 4,443 observations listed in the emerging Taiwanese market. We adopt a dynamic perspective to explore the persistence of the relationship across the life cycle stages of firms over time. Does the impact of ownership on firm performance vary at different life cycle stages? Does it persist across the stages over time? Our empirical results suggest a potential nonlinear relationship between ownership and performance. Furthermore, evidence shows that the impact of ownership on performance is a function of the life cycle effect, where the impact is more pronounced among mature firms over the same period. However, the case is not the same across different periods. To alleviate a potential simultaneity issue, we lag all measures of ownership structure by one year in the fixed-effect regressions framework of panel data. Overall, this paper contributes to ongoing research by extending the importance of the life cycle stages of firms in assessing the impact of ownership on firm performance over time.

JEL：C31; C33; G34

KEYWORDS: Multi-dimensional ownership structure, Performance, Life-cycle stage, Unbalanced panel, Taiwanese market

INTRODUCTION

The Asian Financial Crisis in 1997, the two largest bankruptcies in US history, Enron in December 2001 and WorldCom in July 2002, and the global financial distress in 2008 all point to the importance of corporate governance. Ownership structure is usually considered one of the core internal mechanisms of corporate governance. Does ownership structure affect firm performance? The relationship between ownership structure and corporate performance has received considerable attention in the finance literature. According to the literature, diffuse ownership places significant power in the hands of managers whose interests are not necessarily consistent with—and may even be detrimental to—the shareholders' wealth maximization principle. To constrain or to mitigate managerial opportunism, shareholders use various corporate governance mechanisms to align the interests of managers with those of the shareholders. One mechanism is giving managers equity stakes in firms. The level of the equity stake in the firm explains the positive or adverse relationship between ownership structure and performance, thus giving rise to the convergence-of-interest hypothesis and the managerial entrenchment hypothesis (Jensen and Meckling, 1976; Jensen and Ruback, 1983).

Following Jensen and Meckling (1976), numerous studies have focused on mitigating the conflict of interest between managers and shareholders. Some studies support the existence of a linear relationship, whereas others endorse a non-monotonic relationship between ownership and performance (Morck et al., 1988; McConnell and Servaes, 1990; Adams and Santos, 2006; McConnell et al., 2008). There is a growing consensus that boards have not been sufficiently efficient in monitoring the management, whereas institutional investors have become increasingly willing to use their ownership rights to pressure managers to act in the best interest of the shareholders.

Previous empirical studies on the nature of the relationship between ownership and performance seem to produce mixed results. To extend prior studies**,** this paper specifically explores the effect of the life cycle of firms on the link between ownership structure and firm performance. We further focus on the role of the dimensions of ownership structure: insider ownership, including the members of the board, managers, and block holders; and institutional investor ownership, including pressure-sensitive and pressure-insensitive investors (Brickley et al., 1988; Almazan et al., 2005; Cornett et al., 2007). Less attention has been given to the impact of ownership on performance across the life cycle of firms. In this paper, we assume not only that the sensitivity of ownership structure to firm performance is likely to vary across firms, but it is also likely to undergo important changes across different life-cycle stages over time. Based on these views, this paper extends previous studies by shedding light on several major topics. We first examine the relationship between ownership and performance in the emerging Taiwanese market. By adopting a dynamic perspective, this study further tests the persistence of the relationship across different stages over time.

The empirical results lead us to confirm a potential nonlinear and positive relationship between ownership structure and firm performance. Interestingly, evidence on ownership mechanism from Taiwanese listed firms shows that given a change in shareholding by insiders, there may be a mutually responsive change in institutional investor ownership or in others. This indicates that an increase in insider ownership increases firm values, whereas a decrease in insider ownership before the turning point may coincide with a simultaneous increase in institutional ownership, filling the gap and maintaining improved performance. Furthermore, evidence shows that the impact of ownership on performance is a function of a firm's life-cycle effect; the impact is more pronounced in mature firms over the same period. However, over time, the impact of ownership on firm performance is also driven by the period effect, implying that the impact is a function not only of the life cycle effect but also of the period effect over more than one period.

Our findings are generally robust in using alternative specifications and econometric techniques. We lag all measures of ownership structure in the fixed-effect regressions framework of panel data to alleviate a potential simultaneity issue, finding the robustness of our main results. This paper potentially contributes to the literature in several aspects. Notably, through dynamic specification, the life-cycle stages of firms play an important role in the relationship between ownership structure and firm performance. In the succeeding sections of this paper, we review the literature, propose the conceptual issues, and develop the hypotheses. We describe the methodology used, including the selection criteria of the sample, the categorization of the life-cycle stages of firms, the construction of variables, and the empirical models. We report the empirical findings and discuss robustness tests. Finally, we conclude the paper and present its implications.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Ownership structure is considered one of the core internal mechanisms of corporate governance; hence, the relationship between ownership structure and performance has been widely debated in the finance literature. Numerous studies, mainly based on the assumption that ownership is exogenous, document a causal relationship between ownership and performance. Some support the existence of a linear relationship (Jensen and Meckling, 1976), whereas others endorse a non-monotonic relationship. For instance, to capture possible nonlinearity, Morck et al. (1988) first apply a piecewise linear regression model and find a significant non-monotonic relationship between managerial ownership and performance. Following Morck et al. (1988), several studies (e.g., Hermalin and Weisbach, 1991; Holderness et al., 1999) demonstrate the low-level positive relationship between performance and insider ownership, and the high-level negative relationship between performance and ownership concentration, implicitly suggesting that the negative effects of concentrated ownership outweigh its beneficial effects. Recently, some studies (e.g., Anderson and Reeb, 2003; Adams and Santos, 2006) have documented the significant cross-sectional relationship between insider share ownership and corporate value. Contrary to the belief that managerial control is purely detrimental, these studies find that it has positive effects on the performance of financial institutions over at least some range. McConnell et al. (2008) first account for

the endogeneity of ownership structure and finally find that cross-sectional changes in firm value are characterized by a curvilinear relationship. The results are consistent with a causal interpretation of the empirical relationship between insider ownership and firm value.

Some papers discuss the impact of institutional investor ownership on corporate performance. Pound (1988) proposes three hypotheses on the relationship between the shareholding of institutional investor ownership and corporate performance: the efficient monitoring hypothesis, the conflict of interest hypothesis, and the strategic alignment hypothesis. These hypotheses all suggest a positive or negative effect. Subsequent studies examine the relationship but provide a distinct point of view. McConnell and Servaes (1990) examine the cross-sectional relationship between Tobin's Q and management equity ownership; they find a significant curvilinear relationship for insider ownership and a positive relationship for block holders and institutional investor ownership, consistent with the efficient monitoring hypothesis. In contrast, other studies (e.g., Barnhart and Rosenstein, 1998; Faccio and Lasfer, 2000) find the opposite or show the absence of such significant relationship. Interestingly, Cornett et al. (2007) find a significant relationship between operating cash flow returns and institutional stock ownership. However, this relationship is found only for a subset of institutional investors (i.e., those less likely to have business relationships with the firm).

While the classic principal-agent conflict on dispersed ownership has been debated, empirical evidence reveals that a concentrated ownership structure is more universal (La Porta et al., 1999; Claessens et al., 2000; Yeh and Woidtke, 2005). Using a sample of listed firms in eight East Asian economies, Claessens et al. (2002) show that firm value is enhanced with the cash flow rights of the largest shareholder, consistent with the convergence-of-interest effect. However, there is evidence indicating that high divergence between control rights and cash flow rights, which allows the largest shareholder to control a firm's operations with a relatively small direct stake in its cash flow rights, can discount market valuation, which is consistent with the entrenchment effect (Morck et al., 1988; Lemmon and Lins, 2003; Baek et al., 2004). As a result of concentrated ownership, the main agency problem may turn out to be the principal-principal conflict of interest. This line of research is thus widely argued in the recent literature (Wiwattanakantang, 2001; Durnev and Kim, 2005; Maury, 2006; Villalonga and Amit, 2006).

Generally, the literature review on the relationship between ownership and performance seems to produce mixed results. Plausibly, this stems from the differences in the measurement of variables used (Demsetz and Villalonga, 2001). The previous studies all rely mainly on Tobin's Q or ROA as a measure of firm performance. As for the measure of ownership structure, studies that come after Demsetz and Lehn (1985) focus on insider shareholding, including shares owned by members of the board and of the managers. In contrast, several recent studies (e.g., Almazan et al., 2005; Cornett et al., 2007) suggest that institutional investors are better suited to monitor corporate managers. Moreover, differences in estimation techniques may also provide an explanation for the failure of the extant literature to reach a consensus. Studies that examine the linear or nonlinear relationship between ownership and performance usually apply ordinary least squares. Meanwhile, ownership endogeneity is also addressed by some studies using two-stage least squares or three-stage least squares to a set of simultaneous equations.

Hypotheses Development

Based on previous studies, this paper specifically explores the effect of the life-cycle of firms on the link between ownership structure and firm performance, and sheds light on several major hypotheses. Firms, like products, go through various life-cycle stages: start-up, growth, maturity, and stagnation. Accordingly, a company can be categorized into a corresponding life-cycle stage according to which stage its products are in [Black, 1998 (Fall)]. Previous studies apply the concept of life cycle in the analysis of operating strategy and performance (Smith et al., 1985; Miles et al., 1993; Beldona et al., 1997), and also in related topics (Adizes 1979; Dodge and Robins, 1992). Recent research shows that corporate governance

parameters may be linked to strategic thresholds in the life cycle of firms (Filatotchev et al., 2006). More recently, Ramaswamy et al. (2008) study the relationship between firm growth, life-cycle stages, and corporate governance characteristics. The life cycle model suggests that companies move through a predictable sequence of various life cycle stages through their lifetime. Accordingly, each stage can be clearly isolated and is accompanied by a rebalancing in the activities and organizational structures of firms. In this paper, we focus on three stages: growth, maturity, and stagnation. The first hypothesis is as follows:

H1: The ownership structure and the performance of firms are significantly different across their life cycle stages.

Based on the agency theory, the study predicts that ownership concentration positively affects firm performance up to a certain point; thereafter, additional ownership actually reduces performance. This is consistent with the convergence-of-interest effect and the entrenchment effect. The central theme of this paper examines the impact of ownership structure on firm performance across the different life cycle stages of firms. The different stages involve suitable changes in the management of firms. For example, in the growth stage, investment in growth opportunities begins, and therefore strategies are constantly changing. Firms in the stage of maturity, having fully developed their market and their products, are commonly in a stage of moderate sales growth. This argument leads to the following hypothesis:
H2: The positive association between insider ownership and firm performance is more pronounced (mitigated) among firms in the growth (maturity) stage.

In addition to the concentration of insider ownership, this paper examines the impact of institutional ownership. Prior studies document that firm performance increases as institutional ownership grows. Moreover, it is claimed that institutional investor shareholdings are commonly higher in the stage of maturity (e.g., there is a high dividend payout rate), thereby increasing the incentive to monitor the management of firms. We separately examine whether the splits in ownership—the fractions of members of the board and managers, block holders, pressure-insensitive institutional investors, and pressure-sensitive institutional investors—are helpful in testing the ownership–performance relationship across the life cycle of firms.

H3: The impact of institutional ownership on firm performance is more pronounced (mitigated) among firms in the stage of maturity (growth).

H4: The split specifications of ownership structure are significantly associated with the impact of ownership on performance across the life cycle stages of firms.

To extend most of the prior studies, which focus only on one time period, we adopt a dynamic perspective to test the consistency of the impact of ownership on performance across the life cycle stages of firms over time (Beldona et al., 1997). We subdivide the research period into Period 1 (1999–2003) and Period 2 (2004–2008). Assuming no unusual regulatory changes in the firms, the impact of ownership on performance should not change over time. The hypotheses are as follows:

H5: The impact of ownership on performance will persist while firms characterized as a specific stage in period 1 go through the same stage in period 2.

H6: The impact of ownership on performance will persist while firms characterized as a specific stage in period 1 go through the same firms in the same stage in period 2.

DATA AND METHODOLOGY

Sample Selection

The Taiwanese market is a typical example of an Asian emerging economy in which controlling families

dominate traditional firms, while high-tech companies increasingly demand for the separation of ownership and control (Yeh et al., 2001). This study concentrates on the case of Taiwan's publicly listed companies from 1999–2008 right before and after the two financial crisis periods over the decade. Financial data are obtained from the Taiwan Economic Journal Databank, a databank similar to COMPUSTAT, and China Credit Information Services, a databank company that collects data on business groups in Taiwan. Other data are collected from company prospectuses and annual reports. We exclude financial institutions because of their unique financial structure and regulatory requirements. We eliminate companies with insufficient data (missing values) and companies not listed before the end of 1999. To mitigate the influence of outlying values, we also trim extreme firm-year observations, dropping the top and bottom 1 percent of the observations (i.e., Tobin's Q value is censored at 1st and 99th percentiles as the cut-off point) for each variable. We end up with an unbalanced panel sample of 641 firms and 4,443 firm-year observations, representing 86.51 percent of the companies listed in the Taiwan Stock Exchange (TSE) in 2009.

Categorization of Life Cycle Stages

While previous academic studies use the life cycle of firms to analyze value relevance, we specifically explore the effect of the life cycle of firms on the relationship between ownership structure and firm performance. According to TSE regulation, a great majority of publicly listed companies have gone through the start-up period. We then categorize them into three stages: growth, maturity, and stagnation. Multiple financial indicators and firm age are used to classify the firm-year observations into one of the three life cycle stages. On average, sales growth, marketing expenditure, and capital expenditure are usually higher in the growth stage, forcing companies to apply more conservative dividend policies to keep more funds. However, in the stages of maturity and stagnation, capital and marketing expenditures gradually decrease along with reduced sales growth rates, enabling companies to pay higher dividends. Based on the discussion above, this study uses the classification method proposed by Anthony and Ramesh (1992) and Black [1998 (Fall)], along with marketing expenditure rates (Liang and Lin, 2008) to determine life cycle stages.

The indicators and measurement of life cycle stages are shown in Table 1. According to the results, we define the growth stage as 0, the stage of maturity as 1, and the stage of stagnation as 2 for the five life cycle stage indicators, respectively. The mean of the life cycle stage indicators for these three stages and the analysis of variance to test the reliability of the life cycle classification method are shown in Table 2.

Table 1: Indicator Description and Measurement of Life-cycle Stages

Indicator Variable	Description	Measurement	Score
Years of firm life (YL)	The growth stage occurs early in the life cycle.	The difference between the current year and the year the business was incorporated	2 if in top 33% 1 if in middle 33% 0 if in bottom 34%
Sales growth rate (SG)	A growth firm usually have higher sales growth rate.	The growth rate of net sales revenue	0 if in top 33% 1 if in middle 33% 2 if in bottom 34%
Dividend payout rate (DP)	A growth firm will likely apply more conservative dividend policies to keep funds.	The cash dividend of common stock divided by accounting earnings before extraordinary items	2 if in top 33% 1 if in middle 34% 0 if in bottom 33%
Capital expenditure rate (CE)	A growth firm will likely invest higher capital expenditure.	The capital expenditure divided by net asset	0 if in top 33% 1 if in middle 34% 2 if in bottom 33%
Marketing expenditure Rate (ME)	A growth firm will likely invest higher marketing expenditure.	The marketing expenses divided by net sales revenue	0 if in top 33% 1 if in middle 34% 2 if in bottom 33%

Note: The categorization of life cycle stages involves five life-cycle descriptors that divide the sample into three stages.

Table 2: The ANOVA-test of Life-cycle Stage's Indicators in Mean (1999-2008)

Indicators	Growth stage	Mature stage	Stagnant stage	ANOVA test
Years of firm life(YL)	19.34	25.20	32.32	***
Sales growth rate(SG)	0.33	0.12	0.03	***
Dividend payout rate(DP)	0.73	1.88	3.29	***
Capital expenditure rate(CE)	0.36	0.24	0.14	***
Marketing expenditure rate(ME)	0.08	0.06	0.03	***

*Note: All indicators variables are defined in Table 1. The figure in each cell is the mean of life-cycle stage indicators for three stages, respectively. Analysis of variance is to test for the reliability of a life-cycle classification method. *, **, *** denote significance at the 10%, 5% and 1% level, respectively.*

Results show that companies in the growth stage have the highest mean sales growth rate, capital expenditure rate, and marketing expenditure rate (significant at 0.33, 0.36, 0.08, respectively), and the lowest dividend payout rate and firm age (0.73 and 19.34, respectively) over the period 1999–2008. Therefore, the categorization of these samples is perfectly in accordance with the characteristics of the three life cycle stages. Based on the aforementioned definition, we calculate the composite score of each sample by adding the five indicator values. We obtain the following composite scores for each stage as follows: growth stage (between 0 and 3), stage of maturity (between 4 and 6), and stage of stagnation (between 7 and 10). In sum, the categorization of life cycle stages involves five life cycle descriptors, dividing the sample into the stages of growth, maturity, and stagnation. Consequently, 907 firm-year observations are in the growth stage, 2,654 are in the stage of maturity, and 882 are in the stage of stagnation.

Definition and Statistics of Variables

Most studies (e.g., Holderness et al., 1999; McConnell and Servaes, 1990; Morck et al., 1988) use Tobin's Q to proxy for firm value, whereas Demsetz (1983) and Demsetz and Lehn (1985) employ profit rate (e.g., ROA and ROE) as a measure of firm performance. Demsetz and Villalonga (2001) and Brown and Caylor (2009) apply both Tobin's Q and profit rate for comparison. Does it matter whether one uses Tobin's Q or profit rate as a measure of firm performance? As a measure of firm performance, each has some defects. The profit rate may not be absolutely accurate in measuring the performance of firms in developing countries where accounting standards are not well established (Wiwattanakantang, 2001), whereas Tobin's Q regressions on ownership are more susceptible to endogeneity problems (Cornett et al., 2007). This study thus uses industry-adjusted ROA (IAROA) to proxy for firm performance. IAROA is defined as a firm's ROA less the average ROA for firms in the same industry according to the TSE's industry classification. The IAROA allows us to examine firm-specific performance regardless of any industry-wide effects that may affect ROA.

The primary multi-dimensional ownership structure variables are collected in the study. As a proxy for ownership concentration, the fraction of shares held by insiders (labeled as INSID) is used. Insiders refer to a group of shareholders who manage the company, such as members of the board and managers (the fraction of shares is labeled as BMO), and block holders (BLOCK) who may not be part of the management team or of the board. We also use insider squares (INSID^2) to test if there is a nonlinear ownership–performance relationship as reported by prior studies. Prior studies claim that an increase in share ownership by insiders gives rise to an increase in firm value up to a certain point; thereafter, firm value declines with further increases in insider share ownership. On the other hand, institutional ownership is measured by the percentage of shares held by institutional investors (INS). Several recent studies further categorize INS into pressure-sensitive and pressure-insensitive investors (Almazan et al., 2005; Cornett et al., 2007). The fractions of shares held by pressure-insensitive and pressure-sensitive

institutional investors (INSPRI and INSPRS) are employed. We test whether the type of grouping is useful in examining the ownership–performance relationship across the life cycle stages of firms.

Aside from the abovementioned variables, certain control variables in the model are those that are commonly included in previous studies. Corporate efficiency is associated with firm size; hence, we use the natural logarithm of total assets (NLA) to control for firm size. That firm size and performance are negatively related to each another is possible. To control for firm leverage, liabilities to equity ratio (LER) is used to control for long-term financial structure. Firm leverage accounts for the possibility of lessening agency conflicts through additional monitoring by creditors, which may increase firm performance, whereas the pecking order theory assumes a negative relationship between debt levels and firm performance.

Furthermore, the fraction of seats in the board held by controlling shareholders (SEATR) and the difference between the control rights and the cash-flow rights held by the largest shareholder (VC) measure the entrenchment effect of excessive control rights. Other control variables include R&D (RD), marketing expenditure rate (ME), and asset growth rate (AG). The definitions and statistics of the variables are presented in Table 3.

Table 3: Description of Variables and Summary Statistics (1999-2008)

Variable	Symbol	Variable description	Mean	Max.	Min.	S. D.
Dependent variable :						
Performance	ROA	Return on asset	0.016	0.204	- 0.457	0.040
Performance	IAROA	Industry-adjusted return on asset	0.000	0.182	- 0.478	0.039
Ownership variable :						
Insider ownership concentration	INSID	Fraction of shares held by the members of the	0.416	0.991	0.026	0.160
Board and manager ownership concentration	BMO	Fraction of shares held by the members of the	0.249	0.953	0.001	0.138
Block holder ownership concentration	BLOCK	Fraction of shares held by block holders	0.100	0.700	0.000	0.100
Institutional ownership concentration	INS	Fraction of shares held by institutional investors	0.373	0.999	0.000	0.220
Pressure-insensitive institutional investors ownership	INSPRI	Fraction of shares held by foreign investors, investment companies,	0.089	0.972	0.000	0.133
Pressure-sensitive institutional investors ownership	INSPRS	Fraction of shares held by banks, insurance companies	0.016	0.622	0.000	0.032
Control variable:						
Controlling board- seat ratio	SEATR	Fraction of seats in board held by controlling shareholders	0.641	1.000	0.100	0.213
Deviation of cash flow right	VC	The difference between the control rights and the cash-flow rights held	0.055	0.746	0.000	0.096
Firm size	NLA	Natural logarithm of asset	15.659	20.290	12.584	1.249
Leverage	LER	Liabilities to equity ratio	0.850	32.600	0.010	1.290
Research expenditures rate	RD	Research and development expenditures to sales	0.028	6.287	- 0.082	0.124
Asset growth rate	AG	Asset growth divided by current net asset	0.061	2.228	- 0.281	0.093

Note: This table shows definitions and statistics of the variables. The paper ends up with an unbalanced panel sample of 641 firms for 4,443 firm-year observations listed on the Taiwan Stock Exchange (TSE) during the period 1999–2008. The figure in each cell is the mean, maximum, minimum, and standard deviation of variables, respectively.

While the mean of the dependent variable, ROA**,** is relatively low, mean industry-adjusted ROA is, as expected, nearly zero. The mean insider and institutional ownerships represent 41.63% and 37.35% of the total shares, respectively. Other variables of interest include firm size, debt ratio, R&D, ME, and AG. Using the natural logarithm of total assets, we obtain the mean firm size (15.66). The average debt to

equity ratio is close to 85%. Average research expenditure is low at 2.83%, while marketing expenditure represents 6.14% of the net sales. Finally, the mean value of asset growth constitutes 9.35% of the total assets.

Table 4 shows descriptive statistics pertaining to the stages of growth, maturity, and stagnation for 907, 2,654, and 882 observations, respectively, over the period 1999–2008. The table shows that on average, growing firms are smaller than mature and stagnant firms in firm size. Average ROA is not significantly different between mature and stagnant firms, whereas it is lower among growing firms. Mean insider and institutional investor ownerships are more concentrated at the stages of growth and stagnation than at the stage of maturity, indicating that ownership shareholdings first decline and then elevate through the life cycle. The descriptive statistics confirm H1.

To ensure that multicollinearity does not exist in the regressions, we calculate variance inflation factors (VIF) for the selected variables in the models (not reported). The standard specification tests whether the correlations between the explanatory variables exceed 0.9 or the variance inflation factors for any of the variables exceed 10. We do not find that this is the case.

Table 4: Descriptive Statistics for Firms of Life-Cycle Stages (1999-2008)

	Growing firms		**Mature firms**		**Stagnant firms**	
Variable Symbol	Mean	S.D.	Mean	S.D.	Mean	S.D.
IAROA	0.000	0.046	0.001	0.038	0.000	0.033
ROA	0.013	0.047	0.016	0.039	0.015	0.033
INSID	0.438	0.173	0.409	0.159	0.412	0.147
BMO	0.266	0.149	0.247	0.138	0.237	0.124
BLOCK	0.170	0.110	0.160	0.100	0.170	0.100
INS	0.388	0.237	0.359	0.218	0.400	0.203
INSPRI	0.065	0.114	0.086	0.131	0.119	0.152
INSPRS	0.015	0.027	0.017	0.035	0.016	0.027
SEATR	0.614	0.212	0.642	0.215	0.664	0.206
NLA	15.551	1.441	15.557	1.132	16.079	1.285
LER	0.833	1.500	0.850	1.353	0.700	0.500
RD	0.030	0.051	0.030	0.157	0.018	0.030
ME	0.087	0.122	0.061	0.091	0.033	0.041
AG	0.117	0.306	0.089	0.233	0.080	0.294

Note: This table shows the descriptive statistics of growing, mature and stagnant firms during the period 1999–2008. The sub-samples are 907 firm-year observations for the growth stage, 2,654 for the mature stage, and 882 for the stagnant stage. The dependent variable is industry-adjusted return of asset (IAROA). The independent variables are insider (INSID) and institutional ownership (INS), firm size (NLA), liabilities (LER), R&D (RD), marketing expenditure (ME) and asset growth (AG). All other variables are defined in Table 3. The figure in each cell is the mean (Mean) and standard deviation (S.D.) of variables for growing firms, mature firms, and stagnant firms, respectively.

Model Specification

To assess the relationship between ownership and performance, we first model the pooled least square regressions in the main results and use fixed-effect models to test for robustness. The IAROA is a function of the multi-dimensional ownership structure and various control variables (1). Particularly, we examine the associations across the life cycle stages of firms over the periods 1999–2008, 1999–2003, and 2004–2008. To reassess the impacts, we exploit an interaction between insider ownership and the dummy variables of each of the stages (2). Further, the same specifications with the split of ownership structure are also shown for reference purposes (3). Thus, our main econometric models are presented as follows:

$$Performance = \beta_0 + \beta_1(INSID) + \beta_2(INSID)^2 + \beta_3(INS) + \beta_4(SEATR) + \beta_5(VC) + \beta_6(NLA) + \beta_7(LER)$$

$$+\beta_8(RD)+\beta_9(ME)+\beta_{10}(AG)+\varepsilon \quad (1)$$

$$Performance = \beta_0+\beta_1(INSID)+\beta_2(INSID)^2+\beta_3(INSID)*(Cycle_k)+\beta_4(INS)+\beta_5(SEATR)+\beta_6(VC)+\beta_7(NLA)$$
$$+\beta_8(LER)+\beta_9(RD)+\beta_{10}(ME)+\beta_{11}(AG)+\varepsilon \quad (2)$$

$$Performance = \beta_0+\beta_1(BMO)+\beta_2(BLOCK)+\beta_3(INSPRI)+\beta_4(INSPRS)+\beta_5(SEATR)+\beta_6(VC)+\beta_7(NLA)$$
$$+\beta_8(LER)+\beta_9(RD)+\beta_{10}(ME)+\beta_{11}(AG)+\varepsilon \quad (3)$$

Variable definitions are given in Table 3.

Cycle dummies: $Cycle_k$ k=1,2: $Cycle_1$= 1, for growth stage, otherwise $Cycle_1$=0；

$Cycle_2$= 1, for mature stage, otherwise $Cycle_2$=0.

EMPIRICAL RESULTS

Based on the hypotheses presented Section Hypotheses Development, this section answers the following questions: Does the impact vary at different stages in the life cycle of firms? Does it persist across the stages over time? We provide the main results of the pooled least square regressions. The fixed-effect models of panel data are left for robustness tests.

Impact of Ownership on Firm Value (1999-2008)

In constructing the tests, we consider the potential non-linear relationship between ownership and firm value documented by McConnell and Servaes (1990), among others. The first column of Table 5 reports the results of pooled least square regressions by regressing IAROA on ownership concentrations held by insiders and institutions.

While the coefficient on insider ownership concentration (0.073) is significant at the 1% level and is positively related to firm performance (t-statistic = 4.770), the coefficient on insider ownership squared (-0.059) is significantly and negatively related to firm performance (t-statistic = -3.406). This result is consistent with the causal interpretation by some previous papers, and it may reflect the fact that higher ownership concentrations are linked to higher firm values up to a certain point, after which additional ownership reduces firm performance (i.e., entrenchment effect). An inverted U-shaped non-linear relationship is suggested between insider ownership and firm performance. Ceteris paribus, the turning point is 61.86% and 61.38% for IAROA and ROA, respectively.

The mean shareholding by insiders (41.63%) is under the turning point; hence, higher ownership may be linked to higher firm values, consistent with the convergence-of-interests hypothesis. On the other hand, it is worth noting that institutional investors are increasingly becoming more important in emerging economies. The coefficient on ownership by institutional investors is significant and positive at 0.018, giving these investors a strong incentive to monitor the management, which is consistent with the efficient monitoring hypothesis.

Table 5: Estimates of Panel Pooled Multiple Regressions across Stages (1999~2008)

	All Firms	**Growing Firms**	**Mature Firms**	**Stagnant Firms**
Dependable Variable IAROA				
Independent Variables				
INSID	0.073***	0.051	0.066***	0.087***
	(4.770)	(1.273)	(3.450)	(2.725)
INSID^2	-0.059***	-0.052	-0.041*	-0.088**
	(-3.406)	(-1.189)	(-1.885)	(-2.470)
INS	0.018***	0.019**	0.016***	0.013*
	(5.660)	(2.358)	(3.899)	(2.020)
SEATR	-0.014***	-0.020***	-0.012***	-0.019***
	(-5.215)	(-2.976)	(-3.549)	(-3.385)
VC	-0.043*	-0.030	-0.072**	-0.020
	(-1.942)	(-0.640)	(-2.299)	(-0.409)
NLA	0.002***	0.002	0.002**	0.003***
	(3.430)	(1.287)	(2.569)	(2.887)
LER	-0.040***	-0.004***	-0.003***	-0.013***
	(-8.748)	(-4.209)	(-6.210)	(-6.547)
RD	-0.100**	-0.101***	-0.005	-0.086**
	(-2.260)	(-3.676)	(-1.221)	(-2.396)
ME	-0.026***	-0.030***	-0.017**	-0.108***
	(-4.553)	(-2.724)	(-2.307)	(-4.225)
AG	0.054***	0.061***	0.065***	0.027***
	(26.308)	(13.477)	(22.125)	(7.566)
Observations	4,443	907	2,654	882
Adjusted R-squared	0.310	0.245	0.336	0.264

*Note: IAROA $=\beta_0+\beta_1(INSID)+\beta_2(INSID)^2+\beta_3(INS)+\beta_4(SEATR)+\beta_5(VC)+\beta_6(NLA)+\beta_7(LER)+\beta_8(RD)+\beta_9(ME)+\beta_{10}(AG)+\varepsilon$. This table shows the panel pooled regression estimates of the equation. The model includes the full sample of 641 firms for 4,443 firm-year observations, representing 86.51% of the companies listed on the TSE during the period 1999–2008. The sub-samples are 907 firm-year observations for the growth stage, 2,654 for the mature stage, and 882 for the stagnant stage. The independent variables are insider (INSID) and institutional ownership (INS), firm size (NLA), liabilities (LER), R&D (RD), marketing expenditure (ME), and asset growth (AG). All other variables are defined in Table 3. The T-statistics are reported in parentheses below the estimate coefficients in each cell; *, **, *** denote significance at the 10%, 5%, and 1% level, respectively.*

The coefficient on deviation of cash flow right (VC) and the fraction of board seats held by controlling shareholders (SEATR) are significantly but only marginally and negatively related to performance, consistent with most prior studies. However, the negative sign of the coefficient on liability to equity (LER), consistent with the pecking order theory, is contrary to our expectations. The coefficient on firm size (NLA) has a significantly positive effect on IAROA, indicating that bigger firms have better performance. Other variables of interest include R&D and AG, showing negative and positive signs, respectively.

Impact of Ownership on Firm Value Across Stages Over the Same Period (1999-2008)

To explore the influence and importance of the life cycle of firms, this study divides the full sample into growing, mature, and stagnant firms. Columns (2)–(4) of Table 5 provide results of the panel pooled regressions across different stages over the period 1999–2008. While insider ownership has positive and statistically significant coefficients for regressions of the mature and stagnant firms (0.066, t =3.451 and 0.087, t =2.725, respectively), the coefficient on growing firms (0.051) is positively but insignificantly related to performance. This indicates that the impacts of insider ownership on performance are stronger from growing through stagnant firms in the life cycle. The insider ownership squared has negative coefficients for firms in each of the stages, but again the coefficient on growing firms is not significant.

To reassess the impacts of insider ownership on performance across the life cycle stages of firms, we exploit an interaction between insider ownership and the dummy variables of each of the stages. In unreported results, we find that the coefficient on the interaction term for growing firms is negative but insignificant, while it is positive and significant at the 5% level for mature firms. These results (i.e., that the positive association between insider ownership and performance is more pronounced in firms in the stage of maturity but not in growing firms) seem to be contrary to H2.

On the other hand, the shareholding of institutional investors has positive and significant coefficients across each of the three stages (0.019, 0.016, and 0.013, respectively). In contrast to insider ownership, the impacts of institutional investors on performance are smaller through the life cycle stages for Taiwanese firms. The results provide evidence that the positive association between institutional ownership and firm performance is more pronounced in growing firms than in mature and stagnant firms, which is inconsistent with H3. Alternatively, we recall that the percentage of ownership by insiders is decreasing, while the percentage of institutional investor ownership is right at the opposite way from growth through the stagnant stage (Table 4). The mean insider ownership of the entire sample firms (41.63%) is lower than the turning point of an inverted U-shaped relation (i.e., approximately 62%); hence, insider ownership is positively related to performance. Interestingly, we thus have reason to believe the evidence on ownership mechanism among Taiwanese listed firms: given a change in shareholding by insiders, there may be a mutually responsive change in institutional ownership or in others. This indicates that an increase in insider ownership gives rise to higher firm values, whereas a decrease in insider ownership before the turning point coincides with a simultaneous increase in institutional ownership, filling the gap and sustaining improved performance.

As for the explanatory power of each of the panel models in Table 5, the adjusted R^2 (31%, 25%, 34%, 26%, respectively) are at reasonable levels for the performance equations of the full sample, growing firms, mature firms, and stagnant firms. Compared with similar studies in the literature, the adjusted R^2 seem to be quite acceptable.

Table 6 reports the same specifications but breaks down insider ownership into the fractions of BMO and BLOCK, and institutional investor ownership into INSPRI and INSPRS institutional investors. We separately examine whether the splits are helpful in testing the ownership–performance relationship across the life cycle stages of firms. The coefficients on the fraction of BMO for all firms (0.035, t-statistic = 7.586) and on BLOCK (0.022, t-statistic = 4.437) are both significant. The coefficient on the fraction of INSPRI (0.022) is significant at the 1% level (t-statistic = 4.683), while the coefficient on the fractions of INSPRS (0.028, t-statistic = 1.675) is significant but only marginally at the 10% level. Consistent with the arguments from prior studies, evidence shows that pressure-sensitive institutions (e.g., banks and insurance companies) having either existing or potential business relations with firms may on the margin be less important to incremental firm performance. On the other hand, for growing, mature, and stagnant firms, the coefficient on the BMO is positive and significant, while the other ownership coefficients are only significant for mature firms.

The findings imply that the split specifications of ownership structure may only be able to lessen the agency costs of managerial entrenchment in the mature stage of firms. We note that partly consistent with H4, the impacts of members of the board and pressure-insensitive institutions (e.g., foreign investors and pension fund advisors) are more pronounced in firms in the mature stage but are different from that of aggregate institutional ownership. The evidence addresses the importance of the life cycle stages in assessing the impact of ownership on firm performance. Clearly, for firms in the growth stage, corporate governance is a regulatory requirement, not a competitive tool. However, such is not the case in mature firms. Mature firms are in the stage of moderate sales growth and declining profit margins; hence, corporate governance is a competitive tool, not a regulatory requirement in the emerging Taiwanese market.

Table 6: Estimates of Panel Pooled Regressions Across Stages-the Split Specifications (1999~2008)

	All firms	Growing firms	Mature firms	Stagnant firms
Dependent V.				
IAROA				
Independent V.：				
BMO	0.034***	0.024**	0.041***	0.015*
	(7.586)	(2.233)	(7.291)	(1.647)
BLOCK	0.022***	-0.001	0.030***	0.015
	(4.437)	(-0.129)	(4.848)	(1.521)
INSPRI	0.022***	0.019	0.026***	0.012
	(4.683)	(1.410)	(4.391)	(1.502)
INSPRS	0.028*	-0.066	0.043**	-0.002
	(1.674)	(-1.295)	(2.264)	(-0.061)
SEATR	-0.011***	-0.021***	-0.008***	-0.018***
	(-4.392)	(-3.03)	(-2.666)	(-3.232)
VC	-0.009	-0.013	-0.013	0.006
	(-1.532)	(-0.972)	(-1.525)	(0.435)
NLA	0.001***	0.002*	0.000	0.003***
	(2.870)	(1.785)	(1.301)	(2.707)
LER	-0.003***	-0.003***	-0.002***	-0.013***
	(-8.563)	(-3.995)	(-5.936)	(-6.944)
RD	-0.011**	-0.114***	-0.006	-0.095**
	(-2.588)	(-4.077)	(-1.54)	(-2.597)
Observations	4,443	907	2,654	882
Adjusted R-squared	0.207	0.244	0.238	0.157

*Note: $IAROA = \beta_0 + \beta_1(BMO) + \beta_2(BLOCK) + \beta_3(INSPRI) + \beta_4(INSPRS) + \beta_5(SEATR) + \beta_6(VC) + \beta_7(NLA) + \beta_8(LER) + \beta_9(RD) + \varepsilon$. This table shows the panel pooled regression estimates of the equation. The model includes the full sample of 641 firms for 4,443 firm-year observations, representing 86.51% of the companies listed on the TSE during the period 1999–2008. The sub-samples are 907 firm-year observations for the growth stage, 2,654 for the mature stage, and 882 for the stagnant stage. The dependent variable is industry-adjusted return of asset (IAROA). The independent variables are the board and managers and block holders ownership (BMO and BLOCK), pressure-insensitive and pressure-sensitive institutional ownership (INSPRI and INSPRS), firm size (NLA), liabilities (LER), R&D (RD), marketing expenditure (ME) and asset growth (AG). All other variables are defined in Table 3. The T-statistics are reported in parentheses below the estimate coefficients in each cell; *, **, *** denote significance at the 10%, 5% and 1% level, respectively.*

Impact of Ownership on Performance across Stages with Different Firms over Time

While most studies in the literature focus only on one time period, we adopt a dynamic perspective to test the consistency of the impact of ownership on performance across life cycle stages over time. We subdivide the full research period into Period 1 (1999–2003) and Period 2 (2004–2008). For example, we consider the possible impact on growing firms over Period 1 and on firms (i.e., they may be different from firms over Period 1) in the same stage over Period 2. In this section, we use IAROA as our dependent variable across periods. Separate results for the purpose of comparison are shown in Table

In Columns 1 and 2, while the estimates on ownership structure are less important to firm performance over Period 1, the coefficients on insider and institutional ownership for the full sample (i.e., all firms) and for firms across the stages are more important in both magnitude and significance over Period 2. Take the mature firms for example. The coefficients on the insiders and institutions ownership (0.025 and 0.003, respectively) are all insignificant over Period 1, whereas those in the same stage over Period 2 show a positive and significant relationship with performance. In light of the differences between periods, we re-estimate the regressions, although not reported, using the split specifications of ownership categories and find that the results are qualitatively similar to those mentioned above. Overall, the impacts of ownership on performance seem to be more mitigated over Period 1 (i.e., exactly in the environment of global financial distress) than over Period 2.

As such, this finding appears to account for the lack of persistence of the impacts of ownership on performance over time, inconsistent with H5. This may imply that the impact of ownership on

performance depends mainly on whether there are unusual regulatory changes in firms between periods regardless of whether they are in the growing or stagnant stages.

Table 7: Estimates of Panel Pooled Regressions - across Stages over Time

	All firms		Growing firms		Mature firms		Stagnant firms	
	1999-2003	2004-2008	1999-2003	2004-2008	1999-2003	2004-2008	1999-2003	2004-2008
Dependent V.: IAROA								
Independent V.:								
INSID	0.025	0.088***	-0.010	0.070	0.025	0.091***	0.054	0.056
	(1.308)	(4.150)	(-0.226)	(1.245)	(1.070)	(3.340)	(1.101)	(1.361)
INSID^2	0.008	-0.085**	0.022	-0.070	0.016	-0.079**	-0.019	-0.070
	(0.402)	(-3.595)	(0.420)	(-1.158)	(0.623)	(-2.573)	(-0.328)	(-1.579)
INS	0.002	0.025***	0.007	0.020*	0.003	0.028***	-0.002	0.016*
	(0.616)	(5.625)	(0.805)	(1.737)	(0.67)	(4.986)	(-0.267)	(1.890)
SEATR	-0.020***	-0.011**	-0.008	-0.029***	-0.017***	-0.010**	-0.030***	-0.009
	(-5.628)	(-3.155)	(-1.110)	(-2.842)	(-3.627)	(-2.449)	(-3.87)	(-1.245)
VC	0.022	-0.070**	-0.000	-0.016	0.037	-0.123***	-0.033	0.009
	(0.688)	(-2.487)	(-0.07)	(-0.241)	(0.789)	(-3.046)	(-0.453)	(0.154)
NLA	0.002***	0.001*	0.001	0.001	0.003***	0.000	0.004***	0.002*
	(3.963)	(1.630)	(1.199)	(0.747)	(3.87)	(0.496)	(2.946)	(1.601)
LER	-0.010***	-0.002**	-0.013***	-0.002***	-0.009***	-0.001***	-0.021***	-0.009***
	(-11.969)	(-5.010)	(-6.384)	(-2.624)	(-8.769)	(-3.27)	(-6.961)	(-3.897)
RD	-0.031*	-0.006	-0.096***	-0.122***	0.001	-0.000	-0.046	-0.046
	(-1.705)	(-1.468)	(-3.426)	(-2.753)	(0.0432)	(-0.867)	(-0.596)	(-1.151)
ME	-0.041***	-0.015*	-0.033***	-0.021	-0.061***	-0.005	-0.026	-0.124***
	(-5.767)	(-1.915)	(-3.325)	(-1.075)	(-5.358)	(-0.561)	(-0.646)	(-4.023)
AG	0.030***	0.079***	0.037***	0.084***	0.043***	0.076***	0.012***	0.079***
	(13.867)	(23.403)	(8.596)	(10.840)	(11.848)	(17.88)	(3.504)	(9.511)
Observations	1,683	2,760	353	554	992	1,662	339	543
Adjusted R-squared	0.256	0.239	0.313	0.261	0.304	0.239	0.203	0.251

*Note: IAROA=$\beta_0+\beta_1(INSID)+\beta_2(INSID)^2+\beta_3(INS)+\beta_4(SEATR)+\beta_5(VC)+\beta_6(NLA)+\beta_7(LER)+\beta_8(RD)+\beta_9(ME)+\beta_{10}(AG)+\varepsilon$. This table shows the panel pooled regression estimates of the equation. The dependent variable is industry-adjusted return of asset (IAROA). The independent variables are insider (INSID) and institutional ownership (INS), firm size (NLA), liabilities (LER), R&D (RD), marketing expenditure (ME) and asset growth (AG). All other variables are defined in Table 3. The model includes the full sample of 641 firms for 4,443 firm-year observations, representing 86.51% of the companies listed on the TSE. The sub-samples are 907 firm-year observations for the growth stage, 2,654 for the mature stage, and 882 for the stagnant stage. The sample is further sub-divided into sub-samples of period 1 (1999-2003) and period 2 (2004-2008), respectively. The T-statistics are reported in parentheses below the estimate coefficients in each cell; *, **, *** denote significance at the 10%, 5% and 1%level, respectively.*

Impact of Ownership on Performance across Stages with the Same Firms over time: A Dynamic Specification

To explore further whether the impact of ownership on performance is driven mainly by the period effect, we adopt another dynamic specification to complement the findings reported above (Table 8).

Assuming there are no unusual regulatory changes in the firms, the impact of ownership on performance persists over time (i.e., the same firms across life cycle stages over the period 1999–2003 and 2004–2008). The results show, for example, that the coefficients on insider and institutional ownership for growing firms are insignificant and significant, respectively, over Period 1. Conversely, those of the same firms in the same stage over Period 2 are even more influential on IAROA. The coefficients are positive (0.247 and 0.044) and significant at the 5% level (t = 2.34 and 2.18, respectively), and they are also higher in magnitude. Other examples (not shown to conserve space) are in the same situation. These interesting findings demonstrate that given unusual changes in the environment of firms, the impact of ownership on performance changes over time, which is inconsistent with H6.

Table 8: Estimates of Panel Pooled Regressions-across Stages with the Same Firms over Time

	G→G		G→M		S→S		S→M	
	1999-2003	2004-2008	1999-2003	2004-2008	1999-2003	2004-2008	1999-2003	2004-2008
Dependent V.: IAROA Independent V:								
INSID	-0.083	0.247**	0.079	0.130*	-0.013	-0.141*	0.156*	0.060
	(-1.204)	(2.348)	(1.105)	(1.656)	(-0.221)	(-1.522)	(1.722)	(-1.127)
INSID^2	0.090	-0.236*	-0.070	-0.004	0.048	0.047	-0.128	-0.040
	(1.192)	(-1.941)	(-0.840)	(-0.041)	(0.683)	(0.616)	(-1.179)	(-0.460)
INS	0.042***	0.044**	-0.003	0.009	0.048	0.022**	-0.021	0.013
	(2.699)	(2.185)	(-0.324)	(0.637)	(0.683)	(2.240)	(-1.225)	(0.851)
SEATR	-0.014	-0.039**	-0.000	-0.014	0.003	-0.019**	-0.037***	-0.031**
	(-1.159)	(-2.447)	(-0.017)	(-1.231)	(0.284)	(-2.201)	(-2.650)	(-2.55)
VC	0.050	0.056	-0.047	-0.281***	-0.004	-0.041	-0.087	-0.027
	(0.458)	(0.448)	(-0.601)	(2.821)	(-0.502)	(-0.402)	(-0.706)	(-0.248)
NLA	-0.002	-0.000	0.001	0.004*	0.016	0.003**	0.006*	0.004
	(-1.069)	(-0.282)	(0.864)	(1.794)	(0.066)	(2.194)	(1.940)	(1.272)
LER	-0.013***	-0.001*	-0.010***	-0.025***	0.001	-0.017***	-0.025***	-0.015***
	(-4.565)	(-1.818)	(-3.411)	(-6.962)	(0.730)	(-4.070)	(-6.118)	(-4.016)
RD	-0.139***	-0.170***	-0.059*	-0.175***	-0.005	-0.054	-0.034	-0.750***
	(-3.891)	(-3.238)	(-1.786)	(2.910)	(-1.120)	(-0.865)	(-0.207)	(-3.992)
ME	-0.070**	-0.056*	-0.037***	-0.010	0.013	-0.115**	0.025	0.032
	(-2.454)	(-1.675)	(-3.424)	(-1.050)	(01554)	(-2.051)	(0.397)	(0.721)
AG	0.038***	0.076***	0.033**	0.014	0.009***	0.070***	0.042***	0.107***
	(3.431)	(6.254)	(6.907)	(-1.050)	(2.974)	(7.413)	(2.977)	(6.847)
Observations	133	211	221	317	206	260	143	172
Adjusted R-squared	0.340	0.310	0.291	0.265	0.256	0.272	0.320	0.417

Note: IAROA $=\beta_0+\beta_1(INSID)+\beta_2(INSID)^2+\beta_3(INS)+\beta_4(SEATR)+\beta_5(VC)+\beta_6(NLA)+\beta_7(LER)+\beta_8(RD)+\beta_9(ME)+\beta_{10}(AG)+\varepsilon$*. This table shows the panel pooled regression estimates of the equation with the dynamic specification of the same firms across life cycle stages over the period 1999-2003 and 2004-2008. The dependent variable is industry-adjusted return of asset (IAROA). The independent variables are insider (INSID) and institutional ownership (INS), firm size (NLA), liabilities (LER), R&D (RD), marketing expenditure (ME), and asset growth (AG). All other variables are defined in Table 3. The models are for the full sample, growing firms (G), mature firms (M), and stagnant firms (S). The notations G→G, G→G, S→S, and S→M, denote the stages over Period 1 that go through another stage with the same firms over Period 2, respectively. The T-statistics are reported in parentheses below the estimate coefficients in each cell; *, **, *** denote significance at the 10%, 5%, and 1% level, respectively.*

Robustness of the Results

In this section, we examine the sensitivity of our results to the use of alternative specifications and econometric techniques: fixed-effects panel data models and lagged specifications.

Test of Fixed or Random Effect Model for Panel Data : From the econometric view, there are two main regression models for panel data: fixed effects and random effects. In empirical application, several tests are applied to measure the usefulness of these models. For the equations in the study, the *F*-test and Hausman test reject the null hypothesis (p-value=0.000), confirming that the equations potentially and significantly possess the fixed effect.

Impact of Lagged Ownership on Firm Performance across Stages (1999-2008)

Prior studies usually raise questions on the issue: is ownership structure endogenously determined or is it an exogenous variable that affects performance? As such, we first apply the Granger causality test to examine the causal relationship between ownership structure and firm performance for reference purposes. The results fail to reach a strong consensus. To test for robustness, we then lag all measures of ownership structure and selected control variables in the fixed-effect regressions framework of panel data by one year to signify that ownership and performance do not affect one another contemporaneously. Lagged

values of ownership structure alleviate potential simultaneity and endogeneity issues (Cornett et al., 2007). The lagged specification loses 831 observations in the full sample. We end up with an unbalanced panel sample of 3612 firm-year observations. Table 9 provides the robustness of our main results to the use of alternative specifications. Columns (1) and (2) show the results for the full sample with alternative econometric techniques. In Columns (3)–(8), the results for growing, mature, and stagnant firms are presented, respectively.

Table 9: The Lagged Specifications – panel pooled & fixed effects regressions (1999-2008)

	All firms		**Growing firms**		**Mature firms**		**Stagnant firms**	
Dependent V.: IAROA	**pooled OLS**	**fixed**	**pooled OLS**	**fixed**	**pooled OLS**	**fixed**	**pooled OLS**	**fixed**
Independent V.:								
INSID(-1)	0.044**	0.054**	0.065	0.063	-0.003	0.129***	0.102***	0.006
	(2.571)	(2.119)	(1.404)	(0.745)	(-0.149)	(3.985)	(2.747)	(0.092)
INSID(-1)^2	-0.029	-0.050*	-0.071	-0.104	0.036	-0.142**	-0.108***	-0.011
	(-1.481)	(-1.718)	-1.411	(-1.212)	(1.450)	(-2.399)	(-2.650)	(-0.162)
INS(-1)	0.015***	-0.006	0.019**	0.016	0.015***	0.002	0.012*	0.004
	(4.424)	(-0.903)	(2.015)	(0.425)	(3.336)	(0.276)	(1.641)	(0.020)
SEATR(-1)	-0.012***	-0.007	-0.020**	0.012	-0.010***	-0.021**	-0.017***	0.010
	(-4.428)	(-1.241)	(-2.552)	(0.627)	(-2.875)	(-2.536)	(-2.614)	(0.700)
VC(-1)	-0.064***	-0.128**	-0.039	0.032	-0.085**	-0.071	-0.026	-0.222
	(-2.580)	(-2.536)	(-0.710)	(0.244)	(-2.324)	(-0.946)	(-0.443)	(-1.466)
NLA	0.001***	0.001	0.001	0.004	0.001*	-0.002	0.003**	0.005
	(3.217)	(0.631)	(0.552)	(0.573)	(1.792)	(-0.677)	(2.405)	(0.811)
LER	-0.003***	-0.004***	-0.004***	0.002	-0.002***	-0.040***	-0.008***	-0.020***
	(-7.616)	(-3.166)	(-3.817)	(0.931)	(-5.273)	(-5.930)	(-3.575)	(-3.723)
RD	-0.008*	-0.045***	-0.128***	-0.270***	-0.003	-0.018	-0.054	-0.058
	(-1.703)	(-3.166)	(-3.679)	(-3.849)	(-0.767)	(-1.302)	(-1.262)	(-0.627)
ME	-0.021***	-0.046***	-0.018	-0.060***	-0.014*	-0.040***	-0.128***	-0.180***
	(-3.365)	(-5.662)	(-1.441)	(-3.406)	(-1.773)	(-3.655)	(-4.382)	(-4.435)
AG	0.059***	0.048***	0.076***	0.079***	0.078***	0.064***	0.004***	0.020***
	(23.319)	(18.221)	(11.890)	(8.222)	(20.62)	(16.181)	(5.483)	(4.435)
Observations	3,612	3,612	660	660	2,072	2,072	672	672
Adjusted R-squared	0.198	0.391	0.245	0.375	0.246	0.476	0.132	0.387

*Note: The models lag all measures of ownership structure and selected control variables in the fixed-effect regressions framework of panel data by one year to signify that ownership and performance do not affect one another contemporaneously. The lagged specifications lose 831 observations for the full sample, thereby ending up with an unbalanced panel sample of 3,612 firm-year observations during the period 1999 to 2008. The models are for the full sample, growing firms, mature firms, and stagnant firms. The dependent variable is industry-adjusted return of asset (IAROA). The independent variables are insiders and institutional ownership (INSID and INS), firm size (NLA), liabilities (LER), R&D (RD), marketing expenditure (ME) and asset growth (AG). All other variables are defined in Table 3. The T-statistics are reported in parentheses below the estimate coefficients in each cell; *, **, *** denote significance at the 10%, 5% and 1% level, respectively.*

The lagged insider ownership has positive and significant coefficients of the fixed effect regressions for the full sample and for mature firms (0.054, t =2.12 and 0.129, t =3.98, respectively). The coefficients on the lagged insider ownership squared are all negative but are significant only for the full sample and for mature firms, consistent with the finding of an inverted U-shaped non-linear relationship in the previous section. Overall, the impact of ownership on performance seems to be qualitatively unchanged when we use alternative specifications and econometric techniques. Other control variables (not shown) are mostly confirmed to be significant in the lagged fixed effect regressions. With regard to explanatory power, evidence shows that the adjusted R^2 is at a higher level (approximately 0.37–0.48) for each of the fixed effect models, respectively.

CONCLUSION

Previous empirical studies seem to have produced mixed results on the nature of the relationship between ownership and performance. To extend these studies, this paper specifically explores the effect of the life cycle of firms on the relationship between ownership structure and firm performance. What is the

relationship between them? Does the relationship persist across different life cycle stages over time? Using an unbalanced panel pooled data of 4,443 observations listed in the emerging Taiwanese market, we adopt a dynamic perspective to explore the persistence of the relationship across stages over time. We first model the panel pooled least square regressions in the main results and use fixed-effect models of panel data for robustness tests.

The primary findings of this paper are worth elaborating. First, the evidence strongly indicates that higher insider ownership among Taiwanese firms is linked to higher firm performance up to a turning point, after which additional ownership actually reduces firm performance. The empirical results further reveal that over the same period, the positive association between insider ownership and performance is more pronounced in mature firms. In contrast, the positive association between institutional ownership and firm performance is more pronounced in growing firms than in mature and stagnant firms. Clearly, the life cycle stages of firms play an important role in the relationship between ownership structure and firm performance. Second, we adopt a dynamic specification to examine the impact of ownership on performance across stages and periods, and find that the impacts are significantly different between periods regardless of whether they are in the same life cycle stage with different firms or with the same firms. Third, we lag all measures of ownership structure in the fixed-effect regressions framework of panel data by one year to alleviate a potential simultaneity issues. Clearly, the impact of ownership on performance seems to be qualitatively unchanged, confirming the robustness of our main results.

Overall, this paper potentially contributes to the literature by extending the importance of the life cycle stages of firms, thus assessing the impact of ownership on firm performance. However, our paper has a number of limitations, which suggest areas for further research. For instance, there is a need to document relatively neglected life cycle stages (i.e., the start-up or the renewal firms) and to argue the endogeneity of ownership structure. Demsetz (1983) first argues that a firm's ownership structure may be endogenously determined. Except for insiders, institutional ownership is also susceptible to endogeneity problems. Further research is needed to examine empirically potential simultaneity issues and to enable meaningful comparisons.

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