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Ownership structure, capital structure, and performance of group affiliation

Evidence from Taiwanese group-affiliated firms

Jonchi Shyu

*Department of Business Administration,
National Taiwan University of Science and Technology, Taiwan,
Republic of China*

Abstract

Purpose – This study seeks to examine how agency problems and internal capital markets in group-affiliated firms are mutually influenced by the ownership structure, capital structure, and performance. It also aims to examine the endogeneity in group affiliation.

Design/methodology/approach – Using panel data, this study employs two-stage least squares regression with the instrumental variable technique to examine the relationship among capital structure, ownership structure, and performance of group-affiliated firms. Simultaneous equation models are constructed to identify the effects of interdependent decisions.

Findings – The empirical results indicate a U-shaped relationship between insider ownership and performance. Moreover, the alignment of ownership and control rights determines the relationship between ownership structure and performance for group-affiliated firms. The capital structure decisions of group-affiliated firms are independent of firm performance and insider ownership, supporting the view that capital structure decisions of group-affiliated firms are determined by the overall characteristics of the business group, rather than those of the individual firms.

Practical implications – Business groups can reduce the agency problems that occur in group affiliation by increasing the insider ownership (after a certain tunneling point), debt financing, and dividend payout.

Originality/value – Previous studies have paid little attention to the effects of the agency problem and the internal capital market on group affiliation. Whether endogeneity is a consequence of the common characteristics of group affiliation or a result of the simultaneity existing among ownership structure, capital structure, and performance is also unknown. This paper fills some of these gaps.

Keywords Agency problems, Internal capital markets, Ownership structure, Capital structure, Group-affiliated firms, Operational efficiency, Capital markets

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1. Introduction

Business groups are created when firms link with others through investment transfers. This business model is commonly found in firms in emerging Asian markets. Most group-affiliated firms in Taiwan are connected under strong control. Even without a majority ownership, the controlling shareholders maintain authority by using a pyramid ownership structure, holding different kinds of stocks, or having cross-ownership, among others (Yeh *et al.*, 2001). Thus, insiders who possess control can greatly influence various decisions, enabling group authority to manage the group's business strategy and financial

resources freely. Therefore, the affiliated firms' decision-making behaviors become endogenous determinants, which differ from those of non-group-affiliated firms[1]. Cestone and Fumagalli (2005) demonstrated that the wealth of group subsidiaries is endogenously determined by the allocations of controlling stockholders.

The absolute and exclusive control possessed by insiders within the group may also cause an increase in agency problems and associated costs for determining the performance of group affiliation. Claessens *et al.* (2000) observed that wealth is concentrated within a few families in most Asian economies, including Taiwan, because of the pyramid holding structure. Together with the cross-shareholding structure, such business group models may lead to serious agency problems in group-affiliated firms. By creating such structures, business groups can reduce the value of their own firms[2]. The question that arises is this: why do group-affiliated firms in developing economies still play a significant role? Leff (1976) argued that group-affiliated operations can reduce the influence of imperfections in capital, labor, and product market systems in emerging markets. Several studies also revealed that a group's internal capital market can help firms overcome inefficiency in the external capital market and improve performance (Khanna and Rivkin, 2001; Castaneda, 2007). Unlike stand-alone firms that draw on their own funds, the internal resources of affiliated firms are pooled with those of the group and then reallocated. Through internal capital markets, the group authority can distribute funds among its members, which may lead to economic benefits for financially constrained or temporarily distressed group-affiliated firms. However, internal markets combined with the complex ownership and control structure of group-affiliated firms may lead to greater agency problems. Therefore, business groups are desirable study subjects because they not only use internal markets extensively, but also help to increase the understanding of corporate governance issues in which they arise (Claessens *et al.*, 2006).

The present study examines whether the pyramid holding and cross-holding structures of business groups have significant effects on agency problems and determines how to reduce such costs. Furthermore, the study investigates whether an internal capital market exists within the group and whether group affiliation can benefit firms undergoing cash-flow constraints (e.g. small firms, growth firms, or firms with high R&D expenditures) through the internal capital market. This study contributes to the literature by exploring agency problems and the internal capital market of group-affiliated firms, which play an essential role in determining the performance of business groups. Group affiliation plays a significant role in emerging economies; however, very few studies have paid attention to the abovementioned issues. Although previous studies on group affiliation emphasized the importance of controlling endogenous relationships among corporate finance and governance issues, most of them did not consider this problem[3]. More importantly, this study investigates whether endogeneity is a consequence of the common characteristics of group affiliation (Himmelberg *et al.*, 1999) or a result of the simultaneity existing among ownership structure, capital structure, and performance. The results from this study can bridge some of the gaps in the literature.

2. Ownership structure, capital structure, and performance of group-affiliated firms

Research on ownership structure originated from the hypothesis of Berle and Means (1932) regarding ownership dispersion, which suggests that an inverse correlation

exists between the diffuseness of shareholdings and the firm performance. The convergence of the interest (Jensen and Meckling, 1976) and the entrenchment hypotheses (Jensen and Ruback, 1983) continue to explain the principle-agent problem in corporate finance literature. Demsetz (1983) first proposed the argument that performance and ownership structure influence each other, and that researchers should consider the endogeneity of the two. Succeeding studies on the endogeneity problem also found this relationship (McConnell and Servaes, 1990; Chen *et al.*, 2003). Meanwhile, previous studies found that insiders at the management level have the decision-making power to determine the capital structure of the firm. Kim and Sorensen (1986) observed that the agency cost of debt is reduced as insider ownership increases. In this case, creditors believe that negotiation with managers can reduce agency costs. Short *et al.* (2002) revealed that increasing insider ownership aligns the interests of insiders and creditors. Low agency costs of debt increase debt financing, which show a significant positive relationship between insider ownership and debt financing. On the contrary, Jensen *et al.* (1992) argued that a negative relationship exists between debt ratio and insider ownership. One reason is that insiders with major stakes are less diversified and have more incentives to reduce their financial risks. The other reason arises from higher insider ownership possibly resulting in higher agency costs of debt.

Scholarly views on the signaling part of the capital structure theory are divided into two thoughts. One views a higher leverage level as a pessimistic signal regarding the future, thus having a negative impact on performance (Greenwald *et al.*, 1984). The other suggests that increasing debt is a healthy signal of future performance. Firms taking the risk of increasing debt, even at higher bankruptcy costs, signify their confidence in future operations. Thus, a higher debt level sends a positive signal of future performance (Ross, 1977). In addition, Jensen (1986) argued that higher leverage may be used as a disciplinary device to reduce agency costs, thereby leading to performance improvement (the agency cost hypothesis).

The adoption of new performance measurement methods in recent years led to new developments in capital structure decisions. Berger and Bonaccorsi di Patti (2006) investigated both the effect of leverage on firm performance and the reverse causality relationship between operational efficiency (obtained from data envelopment analysis (DEA)) and capital structure. Two new hypotheses were offered to explain the relationship between leverage and operational efficiency. The first, the efficiency risk hypothesis, assumes that greater efficiency in firms reduces the probability of bankruptcy costs and financial crisis. Therefore, more efficient firms have greater debt capacities and choose higher debt ratios. The second, the franchise value hypothesis, assumes that efficient firms retain their resources to protect their future interests or to deal with any possible future slumps. At this time, firms choose lower debt ratios to avoid high interest costs and to protect their financial strength. The study showed that the agency cost hypothesis exists in the US banking industry; this condition suggests that higher leverage or lower equity capital ratio in banking is associated with higher operational efficiency. However, the efficiency risk and franchise value hypotheses do not exist over the sample period.

If an agency problem is employed as the starting point to examine the relationship among ownership structure, capital structure, and corporate performance, then there may be good reason to believe that firms can increase their leverage to reduce their

agency costs and strengthen their performance. Performance improvement may also increase insider ownership or debt capacity, which, in turn, influences agency problems. The above phenomena indicate that ownership structure, capital structure, and performance may mutually determine one another (Agrawal and Knoeber, 1996; Brailsford *et al.*, 2002). If insider ownership is endogenous in itself, the previous evidence showing that insider ownership affects debt and performance may be misleading. Therefore, simultaneously considering ownership structure, capital structure, and performance is necessary when studying agency problems. This consideration is especially important for business groups because group-affiliated firms are linked with one another. However, most of the prior studies only discussed the relationships between ownership structure and performance (McConnell and Servaes, 1990; Steiner, 1996), between capital structure and performance (Berger and Udell, 2006; Margaritis and Psillaki, 2007), or between ownership structure and capital structure (Brailsford *et al.*, 2002; Short *et al.*, 2002). These studies are relatively divergent and their conclusions are inconsistent. More importantly, the relationships among ownership structure, capital structure, and performance may change because of regional factors (developed or emerging markets) and organization types (independent firms or group-affiliated firms). Hence, a study that focuses on the ownership structure, capital structure, and performance of group affiliation, an important business development model that may involve more complex agency problems, is desirable to achieve a better understanding of the agency problems and internal capital market of business groups in emerging economies.

Group-affiliated firms play an important role in emerging markets characterized by immature legal systems, insufficient transparency, and information disclosure, as well as uncertain economic and political systems. A continuous debate exists on whether these group-affiliated firms have an advantage in emerging markets. The market failure theory posited by Leff (1976) shows that group-affiliated firms can avoid market inefficiencies. Succeeding studies continuously proved that group-affiliated firms perform better than non-group-affiliated ones in emerging markets (Guillen, 2000; Khanna and Palepu, 2000; Khanna and Rivkin, 2001; Castaneda, 2007). Moreover, Leff's (1976) theory was extended to the internal capital market hypothesis (Williamson, 1975; Myers and Majluf, 1984) to explain how group-affiliated firms often have advantages in the early stages of capital market development. The internal capital market hypothesis posits that group-affiliated firms can use internal capital markets to obtain the needed funds when experiencing information asymmetries and external financing constraints (Shin and Park, 1999; Perotti and Gelfer, 2001).

Chang and Hong (2000) sampled group-affiliated firms in Korea and found that, although the performance of group-affiliated firms is not apparent, internal trade may be used to raise profitability. The performance of these group-affiliated firms can also be manipulated by party transactions or accounting measures. Thus, traditional performance measurement indicators such as return on assets (ROA) and return on equity (ROE) are easily affected by management influence on internal sales to boost the net profit. Claessens *et al.* (2006) found gains from group affiliation for East Asian firms; however, these gains do not automatically occur because costs may also arise due to agency problems. Financially constrained companies such as small entities, fast-growing firms, and those with high R&D expenses can benefit more from group affiliation. Manos *et al.* (2007) demonstrated that intra-group loans are also an important

means of transferring funds among Indian group-affiliated firms. Group affiliates are not significantly affected by the availability of non-debt tax shields and the illiquidity of their stocks. Conversely, the determinants of their capital structure decisions are affected by certain group-level factors such as the profitability of other group members and the size of the group.

Although many studies demonstrated that group-affiliated firms have a relative advantage in emerging markets, in which these firms use the internal capital market (debt guarantees, equity investments, and internal funds transfer) and transactions to overcome the insufficiencies of externalities, the empirical results do not fully support these arguments. Singh and Gaur (2009) found that the performance of group-affiliated firms in China and India is worse than that of non-group-affiliated firms. George and Kabir (2008) showed that inefficient profit redistribution exists among group-affiliated firms, which mainly explains the observed “business group discount.”

The aforementioned inconsistent conclusions relating to group affiliation may also occur because of the different measures of corporate performance (Short *et al.*, 2007). Previous studies often employed the ROA, ROE, and Tobin’s Q as performance measurement indicators. Bauwhede (2009) argued that the ROA is the preferred measure for operating performance to study the relationships between corporate governance compliance and operating performance, because the income measure used in computing the ROA (i.e. operating income) is less influenced by discretionary items than the ROE or net profit margin. Another performance measure, Tobin’s Q, reflects the prospects for the firm’s profitability. Demsetz and Villalonga (2001) argued that Tobin’s Q is a community of investors constrained by their market expectations. Most researchers have a better understanding of market constraints than accounting constraints. This situation favors Tobin’s Q and disregards the accounting profit rates in many previous studies. However, caution should be exercised because the:

[...] accounting profit rate is not affected by the psychology of investors, and it only partially involves estimates of future events mainly in the valuation it places on goodwill and depreciation. Tobin’s Q, however, is buffeted by investor psychology pertaining to forecasts of a multitude of world events, which include the outcomes of present business strategies (Demsetz and Villalonga, 2001, p. 213).

Leibenstein (1966) suggested that inefficiency caused by agency problems can be measured by the discrepancy between the maximum potential output and the actual output of a firm. This discrepancy, called X-inefficiency, can be a better measure of the agency costs. Berger and Bonaccorsi di Patti (2006) and Margaritis and Psillaki (2007) argued that using profit (operational) efficiency as an indicator for measuring agency problems is more accurate than using conventional performance indicators. The financial ratios and stock market returns used in literature are typically industry-adjusted and do not account for important differences across the firms within an industry. On the contrary, operational efficiency calculated according to the DEA approach can evaluate how close a firm is to earning the profit that a best-practice firm will earn when facing the same exogenous conditions. This measurement has the benefit of controlling for firm-specific factors outside the control of the management, which are not part of the agency costs (Berger and Bonaccorsi di Patti, 2006, p. 1067) and are used as a proxy for agency costs.

3. Methodology and data

3.1 Measurement of operational efficiency: DEA

Using the original input and output variables, the DEA approach was employed in this study to obtain the operational efficiency of decision-making units (DMUs). DEA had its early origins in the mathematical programming method of the frontier production function proposed by Farrell (1957) to estimate efficiency values and obtain the efficiency frontier. The term “data envelopment analysis” first appeared in research conducted by Charnes *et al.* (1978) as a new mathematical method (i.e. CCR model) to evaluate the efficiency of non-profit organizations.

Under the continuous efforts of succeeding scholars, DEA developed into a general mathematical model, from a single-output efficiency model to a multiple-input and multiple-output model. The conventional DEA models are the CCR and BCC models. The CCR model assumes constant returns to scale (CRS) to measure operational efficiency. Operational inefficiency refers to the difference between the maximum potential output and the observed output while maintaining a given level of input used. However, not all DMUs operate on a similar scale; hence, technical inefficiency may be partly attributed to inappropriate scales. Banker *et al.* (1984) proposed the BCC model, which assumes variable returns to scale (VRS) in production technology to estimate operational efficiency. The operational efficiency of a group-affiliated firm is calculated using the DEA model (BCC model). In the DEA model, three input variables and two output variables are employed; assets, number of employees, and capital are the input variables, whereas operating revenues and net profits after taxes are the output variables. Manufacturing firms mainly utilize plants and equipment, laborers, and invested capital to generate revenue and profits.

3.2 Simultaneous equations for capital structure, ownership structure, and corporate performance

Endogeneity between variables causes bias and inconsistent estimates from ordinary least square (OLS) regression. Previous studies confirmed that endogeneity exists between ownership structure and corporate performance (Cho, 1998), between capital structure and performance (Margaritis and Psillaki, 2007), and between capital structure and ownership structure (Brailsford *et al.*, 2002). However, whether endogeneity is caused by the common characteristics of group affiliation or whether it is a result of the simultaneity between the two variables for the business group is still unknown and merits further study.

Using panel data[4], the present study employed two-stage least squares (2SLS) regression with the instrumental variable technique[5] to examine the relationship among capital structure, ownership structure, and performance by considering the endogeneity problem possibly caused by group affiliation. At the same time, with operational efficiency as a performance measurement, the debt-equity ratio was used for the capital structure and the insider ownership was used as a proxy variable for the ownership structure. The following simultaneous equations models were constructed to identify the effects of interdependent decisions:

- Ownership structure equation:

$$\text{INSIDER} = f(\text{PERFORMANCE}, \text{D/E}, \text{RISK}, \text{SIZE}, \text{DIV}, \text{R\&D})$$

- Capital structure equation:

$$D/E = f(\text{INSIDER}, \text{INSIDER}^2, \text{PERFORMANCE}, \text{RISK}, \text{SIZE}, \text{PROF}, \text{DIV}, \text{R\&D})$$

- Performance equation:

$$\text{PERFORMANCE} = f(\text{INSIDER}, \text{INSIDER}^2, D/E, \text{GROWTH}, \text{SIZE}, \text{PROF}, \text{DIV}, \text{R\&D})$$

Variables: *D/E* – debt-equity ratio; *INSIDER* – insider ownership; *INSIDER*² – insider ownership squared; *PERFORMANCE* – operational efficiency of firms; *SIZE* – total assets of group-affiliated firms; *PROF* – operating income generated by firms; *R&D* – research and development expenditures; *DIV* – dividend payout ratio; *RISK* – operational risk; *GROWTH* – growth opportunity.

3.3 Sample selection and definition of variables

The data on listed manufacturing firms were obtained from the Taiwan Economic Journal (TEJ) database. The selection of group-affiliated firms was defined based on the criteria set by the TEJ[6]. A total of 1,926 firm-year observations of group-affiliated firms were considered over a nine-year period from 1999 to 2007.

Ownership structure (INSIDER). Demsetz and Villalonga (2001) and Brailsford *et al.* (2002), among others, used the ownership of directors and managers (insiders) to examine the relationship between ownership structure and corporate value. The present study employed the same definition for comparison. Insider ownership was discussed in this study because, in the simultaneous equations systems, different institutional ownerships are hardly used as dependent variables on the left-hand side of the ownership equation. Insider ownership is measured by the number of shares owned by the directors and managers/total number of shares outstanding.

Capital structure (D/E). The capital structure variables used in previous studies include total liabilities/total book value of equity, total liabilities/total market value of equity, and total liabilities/total book value of assets. Brailsford *et al.* (2002) used the book value of debt as a proxy for the market value of debt because of the problems in estimating the market values of unlisted debt securities. Bowman (1980) also argued that although the market value of debt is a more accurate measure of leverage, using the book value of debt is not expected to distort the leverage ratios. The present study employed the definition of Brailsford *et al.* (2002), total liabilities/total market value of equity, as a measure of the firm debt-equity ratio (D/E).

Performance (OPERATIONAL EFFICIENCY). Most early studies on performance measurement used accounting data such as the ROA and ROE. These accounting measurements are constrained by the use of accounting earnings, which makes them easily and directly affected by the numbers on financial statements. Thus, measuring business performance by accounting standards may produce biased results. Morck *et al.* (1988) argued that Tobin's Q is a good indicator of the discounted value of the future cash flow because it considers the time value of money and the cost of capital.

During the sample period, Taiwan experienced the effects of the severe acute respiratory syndrome and the 2004 Taiwan presidential elections debacle. These two extraordinary events significantly influenced investor psychology, thereby generating

unusual fluctuations in the Taiwan Weighted Stock Index (TWSI). The differences between the high and low points for the TWSI were 45 percent in 2002, 48 percent in 2003, 35 percent in 2004, and 42 percent in 2005-2006. According to Demsetz and Villalonga (2001), Tobin's Q is more strongly buffeted by investor psychology (in relation to the forecasts of numerous world events) than accounting profit rates. This condition leads us to obviate Tobin's Q as a performance measure. Berger and Bonaccorsi di Patti (2006) and Margaritis and Psillaki (2007) claimed that using profit (operational) efficiency as a proxy for agency costs is more advantageous than using the traditional, financial data-based measures of firm performance, because using operational efficiency can leave out specific factors outside management control that are not part of the agency costs. Hence, the present study employed operational efficiency to measure firm performance.

The selection of control variables is dictated by the literature and data availability, which are described as follows.

Firm size (SIZE). Small firms have difficulty obtaining financing from external financial markets because of information asymmetries; thus, access to internal capital markets is more valuable to small firms than to larger firms. This argument supports the view that small firms are expected to benefit from group affiliation (Claessens *et al.*, 2006) and a negative relationship between firm size and performance is expected. As firms grow in size, the monitoring and agency costs also increase. This condition leads to increased outsider monitoring, which then causes the intent to increase leverage to decline. In general, large firms have more information transparency and are more easily subject to the monitoring of directors or external rating agencies. Increasing transparency reduces agency costs, leading to a decrease in insider ownership (Himmelberg *et al.*, 1999). The present study employed the natural logarithm of total assets as the proxy variable for firm size to eliminate the occurrence of large variation.

Profitability (PROF). The pecking order theory suggests that operating income represents the internal funds available for firm use. When the internal funds grow, firms reduce their borrowing from the external financial market, resulting in an inverse relationship between profitability and leverage (Myers and Majluf, 1984).

The present study used data from listed manufacturing companies that have existed for nine years. If the total sales serve as the denominator, then greater volatility may occur because the total sales are easily affected by economic fluctuations. Hence, the study employed earnings before interest and taxes (EBIT)/total assets to measure profitability.

Growth opportunity (GROWTH). High-growth firms are more likely to have greater financing needs that are harder to obtain through external financial markets. Therefore, high-growth firms are expected to benefit from group affiliation (Claessens *et al.*, 2006), and a positive relationship between growth opportunity and performance is expected. However, if an affiliated firm's performance is dominated by the group authority, the effect of a growth opportunity on firm performance may not be related. In this study, the annual growth rate of total assets was used as the proxy variable to measure growth opportunities.

Dividend payout ratio (DIV). A dividend payout may reduce the agency costs, which results in a positive relationship between the dividend payout ratio and the performance (Jensen *et al.*, 1992). Conversely, a high dividend payout ratio may indicate that there are no better investment opportunities in the future for the company. If this situation continues in the long term, it can lead to a decline in the firm's value, resulting in a negative relationship.

As the dividend payout ratio increases, the internal cash flow decreases and the demand for external funds grows. Under the assumption that the ICM is a cheaper capital source than the external capital market, if group affiliation can provide the economic benefits of internal funds financing, a negative relationship exists between the dividend payout ratio and the capital structure. If insiders prefer firms with high dividends or if an increase in the dividend payout is caused by the potential growth opportunity, then a positive relationship may occur between the dividend payout and the insider ownership. However, when the agency theory is used to explain their relationship, an increasing dividend payout ratio signifies a smaller free cash flow. A declining free cash flow reduces the agency costs and leads to a decrease in insider ownership (Himmelberg *et al.*, 1999). Thus, a negative relationship may exist between the two variables. The study employed the cash dividend per share/earnings per share to measure the dividend payout ratio of firms.

Research and development expenditure (R&D). R&D expenditure is an important intangible asset for firms that seek future growth. If companies spend more funds on R&D innovation and if the resulting products are well received by the market, then the company revenues and profits will also soar, which illustrates a positive relationship between the two (Demsetz and Villalonga, 2001). However, excessive R&D expenditure may impose a heavy cost burden, thereby reducing firm performance. This condition demonstrates the negative relationship between R&D expenditure and performance (Chen and Steiner, 1999).

If R&D expenditure is taken from the perspective of the internal capital market, high R&D firms are expected to gain more from group affiliation because they are more likely to have greater financing needs (through internal funds) that are more difficult to obtain from external financial markets (Claessens *et al.*, 2006). Hence, the relationship between R&D expenditure and capital structure is negatively correlated. If R&D expenditure is viewed as a potential cost of bankruptcy, insiders may worry that the rise in such a cost can lead to a decrease in their wealth. When insiders are risk-averse, the relationship between the two variables is negatively correlated (Chen and Steiner, 1999). By contrast, R&D expenditure also represents the potential growth in profits. If the firm's value rises, the shareholder wealth also increases and a positive relationship exists between the two. In this study, R&D expenditure was calculated as the annual R&D expenditure/operating revenue.

Operating risk (RISK). When the company risk grows, the probability of bankruptcy also rises. As the insider ownership increases, the insider wealth and company value become more related; hence, risk-averse insiders may reduce their ownership to avoid the probability of wealth loss. This condition reveals a negative relationship between operating risk and insider ownership (Bathala *et al.*, 1994). However, Chen *et al.* (2003) mentioned that when market asymmetries exist, managers in firms with greater operational risks need higher insider ownership to gain market recognition, thereby showing a positive relationship between the two. Higher operating risk may also increase the firms' cost of capital and the impact on their debt-equity ratio. This condition may lead to a negative relationship between operating risk and capital structure. The study employed the standard deviation of EBIT/total assets in the previous three-year period (over nine years) to measure operational risk, as suggested by Brailsford *et al.* (2002) (Table I).

Table I.

Definition of variables

Variables	Definition
D/E	Total liabilities/market value of equity
INSIDER	Number of insider shares/number of outstanding shares
INSIDER ²	Insider ownership squared
OPERATION EFFICIENCY	Obtained from the DEA method
SIZE	Natural logarithm of the total assets (in NT\$ million)
PROF	EBIT/total assets
R&D	R&D expenditures/operating revenue
DIV	Cash dividend per share/earnings per share
RISK	Standard deviation of EBIT/total assets in a three-year period
GROWTH	Annual growth rate of the total assets

4. Empirical results

4.1 Descriptive statistics

Table II presents the descriptive statistics of group-affiliated firms. Owing to the effect of ownership control structures on group-affiliated firms, the insider ownership in these firms is generally not high. The debt-equity ratio is less than 1, signifying that equity capital is the primary source of financing within the capital structure of group-affiliated firms in Taiwan. The variation in firm size is small; however, the differences in other variables are relatively large, which demonstrates that characteristics vary widely among group-affiliated firms.

4.2 Simultaneous equations for capital structure, ownership structure, and performance Performance equation. Table III shows the regression results of capital structure, ownership structure, and performance in group-affiliated firms. The results indicate that insider ownership has a U-shaped relationship with corporate performance. When the insider ownership levels in group-affiliated firms are relatively low and situated before the turning point, the control and ownership rights are dispersed[7]. When the control rights precede the ownership rights, the potential for expropriation from the firm and minority shareholders becomes highest; consequently, the values of group-affiliated firms decrease.

Jensen and Meckling (1976) argued that increasing insider ownership is an optimal method to solve agency problems. When insider ownership exceeds a certain level, the

Variable	Mean	SD	Min.	Max.
D/E (%)	87.8	11.65	1.70	184.52
INSIDER (%)	22.24	12.87	2.25	72.77
OPERATION EFFICIENCY	0.559	0.252	0.063	1
SIZE (NT\$ million)	16.142	1.199	13.565	20.247
PROF (%)	4.60	7.9	-48	34
R&D (%)	1.8	3.1	0	54.6
DIV (%)	2.297	2.807	0	16.29
RISK (%)	2.4	2.3	0.1	23
GROWTH (%)	7.1	26.3	-52.9	71.23

Table II.

Descriptive statistics of
group-affiliated firms

Note: Statistical significance at: *10, **5 and ***1 percent levels

Independent variable	Dependent variable		
	PERFORMANCE	D/E	INSIDER
INSIDER	-0.0043788 (-1.74)*	0.0086162 (0.56)	-
INSIDER ²	0.000098 (2.3)**	-0.0000863 (-0.33)	-
PERFORMANCE	-	-0.8602582 (-0.98)	4.479908 (1.23)
D/E	0.0683174 (5.4)***	-	-1.07408 (-2.3)**
GROWTH	0.0228589 (1.54)	-	-
RISK	-	-0.2579027 (-0.18)	10.32124 (1.13)
SIZE	-0.0550096 (-3.95)***	0.1336611 (1.52)	-5.80652 (-10.82)***
PROF	1.41519 (17.22)***	-3.018632 (-2.80)***	-
DIV	0.0156273 (8.34)***	0.0009061 (0.05)	-0.27472 (-2.34)**
R&D	-0.479441 (-2.19)***	-4.548328 (-3.08)***	7.264104 (0.68)
Intercept	1.325708 (5.68)***	-0.7104099 (-0.43)	114.6635 (12.35)***
F-test	12 (0.000)***	5.84 (0.000)***	31 (0.000)***

Note: Statistical significance at: *10, **5 and ***1 percent levels

Table III.
Simultaneous regression
results for capital
structure, ownership
structure, and
performance of
group-affiliated firms

gap between control rights and ownership rights gradually closes. In this situation, the majority of the loss caused by the consumption of prerequisites and the suboptimal decisions conducted by insiders are reduced, and the objectives of insiders and shareholders become aligned. Thus, insider ownership positively influences performance. According to these arguments, the alignment of ownership and control rights determines the relationship between ownership structure and performance for group-affiliated firms. This situation is specific to agency problems of group affiliation.

Capital structure has a significant positive effect on performance in group-affiliated firms. This finding confirms the agency cost hypothesis of Jensen (1986), that is, firms with higher leverage are associated with improved operational efficiency. Profitability has a positive effect on performance, as expected in group-affiliated firms. This finding is similar to the results of Himmelberg *et al.* (1999). Size has a significant negative effect on performance for group-affiliated firms, demonstrating that those with small sizes may benefit from group affiliation. The finding also implies that group affiliation may benefit financially constrained firms from the internal funds financing. This result is consistent with the findings of Claessens *et al.* (2006). R&D expenditure shows a negative effect on performance. This result illustrates that high R&D spending is a heavy burden that reduces firm operational efficiency for group-affiliated firms. The dividend payout ratio has a positive effect on performance, which indicates that dividend distribution can improve operational efficiency for group-affiliated firms.

Capital structure equation. Insider ownership does not reach a significant level with the capital structure for group-affiliated firms. The performance of a group-affiliated firm also has no effect on its capital structure. The above findings imply that an internal capital market may exist in group-affiliated firms (Shin and Park, 1999; Perotti and Gelfer, 2001). In other words, when the operation of an internal capital market exists, the capital structure of group-affiliated firms can be dominated by the group authority and is, therefore, not affected by insider ownership and performance. Moreover, the efficiency risk and franchise value hypotheses proposed by Berger and Bonaccorsi di Patti (2006) do not apply to group-affiliated firms in Taiwan.

Profitability has a negative effect on capital structure. This result confirms that the pecking order hypothesis (Myers and Majluf, 1984) exists in group-affiliated firms in Taiwan. The capital structure of group-affiliated firms depends not only on transfers within internal capital markets, but also on the ability to generate operating income. R&D expenditure has a significant negative effect on capital structure. This negative relationship implies that financially constrained group-affiliated firms can benefit from the internal capital market of the business group.

Ownership structure equation. The capital structure has a significant negative effect on insider ownership. This result indicates that insiders of group-affiliated firms are concerned with the probability of wealth loss. Performance does not have a significant relationship with insider ownership, which demonstrates that insider ownership of group-affiliated firms may be influenced by the group level rather than the individual firm level.

Size has a negative effect on insider ownership for group-affiliated firms, which is consistent with the argument of Himmelberg *et al.* (1999). When firms grow, the need for them to be monitored by external agencies also increases, which leads to a lower optimal level of insider ownership. The dividend payout ratio has a negative effect on insider ownership for group-affiliated firms. This result illustrates that a decrease in free cash flow reduces the agency costs, and thus decreases insider ownership.

5. Conclusion

In emerging economies, group affiliation is a rational response to the institutional environment confronting firms (Yeung, 2006). However, most previous studies only focused on comparing the performance of group-affiliated and non-group-affiliated firms, and on analyzing the reasons for the differences. Thus, studies that analyze the factors affecting agency problems (the costs of group affiliation) and the internal capital market (the benefits of group affiliation) of group-affiliated firms are relatively rare. The present study examined how agency problems and internal capital markets in group-affiliated firms are mutually influenced by ownership structure, capital structure, and performance. In addition, whether the endogeneity problems of group affiliation arise from the common characteristics of affiliated firms or whether they are a result of the simultaneity existing among ownership structure, capital structure, and performance was also examined.

Based on a sample of Taiwanese firms, the empirical findings indicate a U-shaped relationship between the insider ownership and the performance of group-affiliated firms. The distinct ownership structure of business groups (i.e. cross-holdings and pyramid shareholdings may cause the dispersion of control rights and ownership rights) clearly affects the agency problems. However, business groups can reduce such problems that occur in group affiliation by increasing insider ownership (after a certain tunneling point),

debt financing, and dividend payout. When insiders increase their holding to a particular level, the higher ownership can increase the alignment between ownership rights and control rights. These stronger alignments lead to lower agency costs. Increasing equity ownership by managers and greater shareholdings for directors are two ways that can potentially reduce agency problems. However, the agency problem among the insiders (majority shareholders and senior managers) should not be ignored. A number of studies have shown that substantial equity ownership by outside blockholders and the appointment of outside directors can increase/improve the degree of monitoring, and thus reduce the agency problem between managers and shareholders (Maug, 1998; McConnell and Servaes, 1990; Pearce and Zahra, 1992; Zeckhauser and Pound, 1990). Too large or too small an ownership stake by senior manager and majority shareholders can potentially lead these groups to make decisions that may have an adverse effect on the firm (Barnhart and Rosenstein, 1998; McConnell and Servaes, 1990). Seifert *et al.* (2005) pointed out that an optimum amount for many of the mechanisms used to reduce the agency problem between senior managers and majority shareholders may exist. Future research is necessary to examine this issue more thoroughly and to determine which ownership stake for senior managers and majority shareholders can help group-affiliated firms dilute their agency problem. Moreover, to increase debt financing puts higher pressure on insiders and will lead to more monitoring by the external market, both resulting in the reduction of agency costs. Jensen *et al.* (1992) indicated that an increase in dividend payouts may lower the internal cash flow and reduce the mismanagement of free cash flow from insiders. A dividend payout increase may also raise the need for external funds and cause an increase in monitoring by outsiders, both scenarios implying a decrease in agency costs.

Performance does not have an effect on insider ownership, which demonstrates that the ownership structure of group affiliates in Taiwan is not related to their performance. The finding that the capital structure decisions of group-affiliated firms are independent of firm performance and inside ownership supports the view that the capital structure decisions of group-affiliated firms are determined by the overall characteristics of the business group, rather than those of the individual firm. The authority of the business group should think more about the possibility of value creation from resource allocation/sharing when making their strategic decisions. These pieces of evidence also indicate that the main source of the endogeneity problem of group affiliation is a consequence of the characteristics of affiliated firms, which affect their capital structure, ownership structure, and performance, but not the simultaneity between them. Although the results confirm the existence of an internal capital market in business groups, the evidence that exists regarding the economic benefits of internal funds financing for group affiliation is weak. Whether group affiliation can benefit financially constrained firms requires further investigation. Future studies can utilize a more sophisticated approach by collecting and analyzing data on fund flows and capital allocation among affiliates to verify the benefits of an internal capital market for a business group. In addition, Ang *et al.* (2000) suggested that the expense and asset utilization ratios as proxies for agency costs can be applied in future studies on the agency problem for group-affiliated firms. Principle to principle conflicts are more prevalent in emerging economies (Young *et al.*, 2008); hence, how the principle to principle conflicts and conflicts among the insiders affect the management decision and performance of group-affiliated firms are other important questions that remain

to be answered. Further investigations will allow us to gain a better understanding of the corporate governance of business groups in emerging economies.

Notes

1. Himmelberg *et al.* (1999) found that value and insider ownership in US firms are explained by common characteristics, several of which are unobservable. Ignoring these characteristics will lead to biased conclusions regarding the influence of insider ownership on value.
2. As argued by Claessens *et al.* (2002) as well as La Porta *et al.* (2002), the deviation of ownership rights from control rights through stock pyramids and cross-shareholdings can result in greater agency problems because it creates incentives for the controlling shareholder to divert value from the minority shareholders.
3. Demsetz and Lehn (1985) and Agrawal and Knoeber (1996) confirmed that inconsistent statistical findings occur when endogeneity is not considered.
4. Pindado and De La Torre (2004) argued that the use of panel data allows the control for heterogeneity through the individual effect, in which the common determinants of ownership and performance will be included. We applied the Hausman test to determine whether the random model or the fixed model should be used with the panel data. The *F*-test showed that the fixed effect should be adopted to avoid the unobservable firm characteristic (group affiliation) that may also determine the ownership structure, capital structure, and performance.
5. The selection of instrumental variables was performed according to the approach of Hermalin and Weisbach (1988) and Kuznetsov and Muravyev (2001), in which lagged dependent variables from regressions are employed as instrumental variables.
6. Firms ultimately controlled by the same entity include the following conditions: (1) the majority of shareholders belong to the largest shareholders, the top ten shareholders, or those who hold at least 5 percent of the firm's shares; (2) at least one-third of the firm's board members are identical to those of other affiliated firms; (3) the CEO is the same as that of the other affiliated firms; (4) firms are controlled by or are subordinated to an affiliated firm; and (5) firms have mutual investment relationships with other affiliated firms.
7. Demsetz and Lehn (1985) argued that in firms that grow in size, such as group-affiliated firms in a business group, ownership increasingly becomes dispersed, resulting in the dispersion of ownership and control rights. In the listed family firms (most of which belong to business groups) in Taiwan, the control rights are 28.61 percent and the ownership rights are 10.03 percent on average.

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Corresponding author

Jonchi Shyu can be contacted at: jonchi.shyu@msa.hinet.net

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