

Ownership Structure, Excess Cash Holdings, and Corporate Performance

Yueh-Er Ji*, Ming-Chang Cheng**, Chien-Chi Lee***
and Yu-Min Lin****

This research aims to investigate the correlation between a firm's ownership structure and cash management policy and then evaluate performance effects. Focusing specifically on the agency problem between the controlling shareholder and minority shareholders, the perspective of ownership structure can be an effective lens for examining why firms hold so much excess cash and extend the managerial discretion issue that highlights the possibility for controlling shareholders to transfer liquidity resources without fully pursuing investment opportunities. Our empirical estimates report that the board of directors and supervisors places greater emphasis on current value and that members likely have much more power over managers to direct the cash utilization policy. This agency problem clearly proves the necessity of an independent figure, such as an independent director, to play a monitoring role in corporate management.

JEL Codes: G32

1. Introduction

1.1 Research Motivation

Corporate governance issues have gained interest following corruption scandals featuring large corporations worldwide. Consistent with global business trends, Taiwan's firms are encountering conditions where bigger means stronger as well as the rise of complicated organizational structures or financial manipulations as further increased interest in valuing corporate governance. The purpose of corporate governance to reduce agency costs, prevent unexpected financial crises and generate proper management and monitoring mechanisms; the ultimate objective of corporate governance is to maximize firm value and ensure sustainable corporate development.

Berle and Means (1932) introduced the ownership dispersion hypothesis to explain the separation of ownership and control, assuming that a company's shares should be distributed to minority shareholders and that managers are allowed to possess controlling rights. Jensen and Meckling (1976) subsequently proposed "Agency Theory" to describe the conflict of interest between a "Principal" and an "Agent." The information advantage and monitoring difficulty induces the agent to pursue his or her own self-interest and act against the principal's interest. This conflict forces corporate governance to establish an appropriate mechanism to reconcile the opposing interests of those two parties.

*Yueh-Er Ji, Ph.D. Candidate, Guanghua School of Management, Peking University, China.

**Ming-Chang Cheng, Associate Professor, Department of Business Administration, National Chung Cheng University, Taiwan. Email: bmamcc@ccu.edu.tw

***Chien-Chi Lee, Ph.D. student, Department of Business Administration, National Chung Cheng University, Taiwan; Lecturer, Department of Hospitality Management, Taiwan Shoufu University.

****Yu-Min Lin, Graduate student, Department of Business Administration, National Chung Cheng University, Taiwan.

Ji, Cheng, Lee & Lin

Further discussion about agency problems can be referred to the manager's discretion over cash holding policy. Jensen (1986) noted that excess liquidity is an important factor that leads to agency problems. When a corporation owns excess cash, managers may consume the resource on unnecessary expenses and unprofitable investments to pursue their own interest without restriction. In empirical studies, Bates, Kahle, and Stulz (2008) discovered to their surprise that the average American firm can retire all of its debt obligations with its cash holdings. Similarly, Liao(2011) observed the same phenomenon in most non-financial Taiwanese listed companies in 2009.

A firm that holds cash does so primarily to manage its daily liquidity needs, but many studies have debated the appropriate level of cash holdings, providing some controversial perspectives. According to the "Pecking Order Theory," asymmetric information will dominate a firm's financing decisions, which makes managers prioritize their financing sources in accordance with lower transaction costs such that preference is given to internal funds first, followed by debt financing and then equity issuing as the last option. Consequently, a strategy of maintaining higher cash holdings is capable of guaranteeing low transaction costs, external financial costs, and interest costs.

A controversial argument in favor of high cash holdings is related to managerial discretion, where an agency problem between managers and shareholders will emerge because managers may use cash for their own interest and exploit minority shareholders. Furthermore, holding more cash implies a low return on assets, which would then increase pressure in terms of the firm's cost of capital.

Papaioannou, Strock, and Travols (1992) and Myers and Rajan (1998) thus argued that "Pecking Order Theory" does not always dominate "Agency Theory," leading to the emergence of concern over agency costs related to cash holding policy. When the ownership of firms is diversified or managers hold a relatively small share of the firm, the strengthened decision-making power of managers will not be in the firm's interest. As a result, ownership structure becomes a crucial issue in considering the agency problem between managers and shareholders.

Most previous studies on this topic have discussed the separate impacts of the ownership structure or cash holding policy has on corporate performance. Our research will connect these two perspectives and study the correlation between ownership structure and excess cash holdings among Taiwan's corporations. The essay will conclude by identifying how ownership structure affects a firm's cash holding policy and whether large cash holdings indicate preparation for valuable investment opportunities or whether they imply the inducement for controlling shareholders to transfer liquidity resources for their own interest, preventing the company from fully using their resources in pursuit of investment opportunities.

1.2 Research Objectives

This study proceeds from the perspective of ownership structure to observe corporations' policy of maintaining excess cash holdings. Our research objectives are to determine how a firm's ownership structure affects its cash holding policy and discuss how this excess liquidity is used or transferred. By specifically examining the agency problem between the controlling shareholder and minority shareholders, the

paper will measure the effect of agency problems on Taiwanese corporations' operating performance.

Therefore, the objectives of this research are to investigate the correlation relation between ownership structure and excess cash holdings policy among Taiwan's listed companies. In addition, we aim to explain the phenomena of excess cash holdings and firm performance with the perspectives of ownership structure.

The paper will proceed as follows: we use the sample of all Taiwanese non-financial listed firms during the period 2001 to 2009 and then construct cross-sectional time series sample using panel data analysis. The regression tests will confirm the influence on operating performance from each component of ownership structure in the scenario of excess cash holdings.

The findings will be interpreted to clarify an excess cash policy among Taiwanese firms, which is intended as preparation for unanticipated contingencies where the costs of using other financial tools are prohibitively high.

The rest of this study is organized as follows: Section 2 reviews the relevant literature, and Section 3 describes the methodology and study samples. Section 4 presents the study variables and discusses our hypothesis development. Section 5 discusses the cash holding/ownership structure situations in Taiwan. Section 6 shows the empirical results. Section 7 concludes the study.

2. Literature Review

2.1 Ownership Structure and Agency Problem

Jensen and Ruback (1983) defined an "Entrenchment Hypothesis," which states that the opposition to minority shareholders and managers or board of directors may drive the mechanism to decrease firm value. Jensen et al. (1983) studied takeovers, finding that a higher concentration of ownership leads managers or boards of directors to select unfavorable proposals to protect their jobs and power. Accordingly, a level of managerial ownership that is concentrated enough to strengthen the manager's control rights may induce managers to pursue their interests instead of maximizing the firm's value.

La Porta, Lopez-de-Silanes and Shleifer (1999) then discussed the constituent elements of ownership structure, focusing on the largest 20 firms in 27 wealthy economies by stock market capitalization at the end of 1995. Their empirical results showed the tendency of high concentrations of ownership structure and that most of these firms are typically controlled by families or the state. Moreover, 68.59% of these firms were identified as being controlled by ultimate controlling shareholders.

To address the suspicion that ownership structure plays an important role in determining whether controlling shareholders expropriate minority shareholders, Lemmon and Lins (2003) used a sample of 800 firms in eight East Asian countries to study the effect of ownership structure on value during the region's financial crisis. The paper confirmed the negative impact on firms' investment opportunities during crisis while highlighting the incentives for controlling shareholders to expropriate

minority investors.

Discussing East Asian countries more specifically, Claessens et al. (2000) examined the separation of ownership and control in 2,980 corporations in nine East Asian countries and demonstrated that over two thirds of firms were controlled by a single shareholder using pyramid structures, cross-holdings and exchange of board. Such structures allow controlling shareholders to have significant power over firms with relatively low stakes and often allow them to gain voting rights that exceed cash flow rights.

Claessens et al. (2000) also found that 48.2% of all 382 listed firms in Taiwan were family controlled, indicating that most of the ultimate controlling interests were dominated by family groups. In its review of ownership structures in Taiwan, the voting rights were 18.96% compared to the cash-flow rights of 15.98% (ratio of cash-flow to voting flow was 0.83). Moreover, 49% of ultimate owners used pyramids and 8.6% used cross-holdings to reinforce their power; these two approaches were ranked third and sixth place within all nine East Asian countries.

2.2 Agency Problem and Excess Free Cash Flow

Jensen et al. (1976) mentioned that once the fraction of managers' equity decreases, the fractional claim on the outcomes decreases, which will tend to encourage managers to consume larger amounts of the corporate resources; these consumed resources are called "perquisites". This conflict of interest would diminish when managers seek to accumulate more current free cash flows to cope with future capital demands without market monitoring.

However, Bates et al. (2008) found the surprising result that the average American firm can retire all of its debt obligations with its cash holdings. This policy of holding excess cash implies there is no need for firms to use financial leverage, a phenomenon that would affect the manipulation of government monetary policy and financial wholesale banking. In the context of corporate governance, this phenomenon suggests agency problems concerning non-pecuniary benefit and overinvestment.

Based on most literature review, there is no definite argument for or against firms' seeking to hold excess cash. Disregarding the need for regular liquidity-based demand for capital, two theories could explain why firms currently hold much more cash than they have in the past: the "Static Trade-Off Theory" and the "Pecking Order Theory." The primary difference between these two theorems is the assumption of the existence of an optimal level of cash balancing investment decisions and cash holdings. In addition to these economic theories, the agency theory could also explain why these firms hold excess cash.

Opler, Pinkowitz, Stulz and Williamson (1999) and Myer and Majluf (1984) claimed that agency problems caused by asymmetric information enable firms to hold large cash reserves. According to the hypothesis of asymmetric information, firms intend to maintain cash reserves adequate for meeting the capital needs of all valuable investing activities to prevent the agency cost of debt.

Nevertheless, Jensen (1986) stated that excess liquidity is an important factor that causes agency problems. In theory, companies should use their excess free cash to declare cash dividends to its shareholders when there is no positive-NPV investment project; however, this policy will threaten the rights of managers because available resources will be diminished. Managers pursuing their own interest tend to reserve excess cash to prevent limitations against future investing and the expensive external financing.

However, Dittmar and Marhart-Smith (2007) and Harford, Mansi and Maxwell (2008) noted that in the US, weakly controlled managers choose to spend cash quickly on acquisitions and capital expenditures rather than hold it.

2.3 Excess Free Cash Flow and Ownership Structure

The empirical results of Mikkelson and Partch (2003) showed that ownership structures have no significant influence on corporate cash holdings. However, Dittmar et al. (2003) found that large cash holdings continue to exist in countries with strong shareholder protection, concluding that ownership structure remains a critical factor affecting cash holdings. The primary issue causing this contradiction concerns the soundness of a country's financial institutions.

Ozkan and Ozkan (2004) investigated corporate cash holding for a sample of UK firms during the period 1984 to 1999. Their study found managerial ownership and cash holdings to be in a clearly significant non-monotonic relationship. This study referred to the opposing effects between managerial ownership and cash holdings as the alignment effect and the entrenchment effect. The alignment effect reflects a negative relationship between managerial ownership and cash holdings, and the entrenchment effect suggests that managers may choose to hold more cash to satisfy their self-interest, causing the relationship between cash holding and managerial ownership to become positive at higher levels of managerial ownership.

Kusnadi (2003) examined the relationship between corporate cash holding and corporate governance mechanisms in 230 listed firms in Singapore. The document showed a significant positive relationship between board size and cash holdings and a negative relationship between non-management controlling ownership and cash holdings. This paper indicated that a larger board size and lower ownership of non-management blockholder result in inefficient corporate governance. Most shareholders of such firms do not have enough power to force managers to distribute the excess cash to them and allow the company to possess more cash than the company with sound corporate governance.

3. Data and Methodology

3.1 Data Resource and Sample Selection

The data set used in this study was obtained from the Taiwan Economic Journal (TEJ). The sample meets the following criteria:

- (1) Observations are year-end data from 2001-2009;

- (2) Following previous studies, we have isolated firms operating in the financial industry (banks, insurance companies, securities companies, etc.) from our samples;
- (3) Our sample consists of firms listed on the Taiwan Stock Exchange (TWSE). We collected data on financial variables, such as the Cash Ratio, Tobin's Q, Cash flow, Net Working Capital, R&D, investment, and Leverage, and ownership variables, such as board structure, ownership concentration, and other relevant variables, for each company for the fiscal years in the period 2001-2009;
- (4) The missing data are eliminated according to our data restrictions, and the final panel consists of 6,669 firm-year observations from 4,572 observations for 508 listed firms.

3.2 Methodology

Our estimation follows the method introduced by Opler et al. (1999) and presented in Fama and MacBeth (1973). The model is a cross-sectional regression and estimates the panel data for each year. This method aims to eliminate the problem of serial correlation in the residuals of a time series cross-sectional regression. The model effectively measures each year as an independent cross-section

Our sample is estimated as time-series and cross-sectional data. The use of different entities across panel data limits the problems of heteroskedasticity and bias. Panel data estimation is often considered to be an efficient analytical method of using econometric data, allowing the inclusion of data for N cross-sections (e.g., ownership structure, cash holdings, etc.) and T time periods (e.g., years, quarters, months, etc.) The combined panel data matrix set consists of a time series for each cross-sectional member of observations while allowing increases by including developments over time.

A panel data set is formulated by a sample that contains N cross-sectional units (i.e., share concentration) that are observed at different time periods T. Consider, for example, a simple linear model with one explanatory variable as given by:

$$Y_{it} = \alpha + \beta X_{it} + u_{it}$$

Where the variables Y and X have both I and t subscripts for $i = 1, 2, \dots, N$ sections and $t = 1, 2, \dots, T$ time periods. We call our panel data balanced because we obtain a full nest of data both across ownership structures and across time.

In general, simple linear panel data models can be estimated using three different methods: a) with a common constant as in the equation, b) allowing for fixed effects, and c) allowing for random effects.

In the fixed effects method, the constant is treated as group (section) specific. This treatment means that the model allows for different constants for each group (section). A fixed effects method essentially captures all effects that are specific to a particular individual and that do not vary over time. Therefore, the model is similar to $Y_{it} = \alpha + \beta X_{it} + u_{it}$. The fixed effects estimator is also known as the least-squares dummy variables (LSDV) estimator because to allow for different constants for each group, it includes a dummy variable for each group. To understand this procedure

better, consider the following model:

$$Y_{it} = a_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_k X_{kit} + u_{it}$$

Before assessing the validity of the fixed effects method, we must apply a test to assess whether fixed effects (i.e., different constant for each group) should indeed be included in the model. To do so, the Redundant FE test can be used to measure fixed effects against the simple common-constant OLS method. The Hausman test is formulated to assist in choosing between the fixed effects and random effect approaches.

To avoid multicollinearity, we use VIFs (Variance Inflation Factors) to determine the variables. In addition, we use the Durbin-Watson test to detect the presence of autocorrelation. The table of all of the regression's VIFs is posted in the appendix. Most of the VIFs are controlled below 4, indicating no problems of multicollinearity. However, the VIFs of cash and excess cash are over 4 but below 10, indicating a slight but manageable multicollinearity problem. We leave the regression alone because we want to observe the different effects on corporate performance.

4. Variables

4.1 Measure of Cash Holdings

Excess cash holdings are defined as the deviation between real cash holdings and expected cash holdings. The main independent variables of cash holding follow those used by Opler et al. (1999), who assumed that the costs of holding cash primarily arise from idle capital. The main determinants of cash holding that are identified are as follows: Size, Tobin's Q (or market-to-book ratio), cash flow, net working capital, R&D, investment, total leverage, firm's cash flow riskiness and cash dividend payouts.

The variables used are as follows:

1. *Cash holdings*: We measure the cash holdings as the ratio of cash and marketable securities to net assets (total assets minus cash and marketable securities).
2. *Size*: Firm size is calculated as the natural logarithm of the book value of assets and deflated using the CPI in 2006 dollars. We predicted the negative relationship between cash holding and size because small firms usually face much more financial restriction.
3. *Growth opportunity*: We use the market-to-book ratio as the book value of assets minus the book value of equity plus the market value of equity as the numerator of the ratio and the book value of assets as the denominator. A firm with better investment opportunities is expected to have positive net present value projects in the future and value its cash more due to costly financial constraints. A higher market-to-book ratio indicates higher the growth options available to the firm.
4. *Cash flow to net assets*: We measure cash flow by dividing earnings after interest, dividends, and taxes but before depreciation by net assets. Firms

with higher cash flow accumulate more cash, which may present better investment opportunities.

5. *Net working capital to net assets*: Net working capital consists of assets that substitute for cash. Firms may choose to hold liquid assets in addition to cash to insure themselves against losses. Some firms liquidate receivables as a means of raising cash, so we use working capital minus cash as a measure of liquid asset substitutes. We thus expect a negative relationship between NWC and cash holdings.
6. *R&D to net assets*: We use the R&D expense-to-net assets ratio to proxy for potential financial distress costs. Firms with large R&D ratios are assumed to face greater costs from financial distress, which leads to a positive relationship between the cash ratio and R&D spending. R&D is set equal to zero when R&D expense is not reported.
7. *Capital expenditures to net assets*: The investment of the firm is measured by capital expenditures divided by net assets. Capital expenditures are calculated as the difference between purchases of fixed assets and depreciation. If capital expenditures create assets that can be used as collateral, these expenditures may increase debt capacity and reduce demand for cash. Meanwhile, capital expenditures could proxy for financial distress costs or investment opportunities, in which case they would be positively related to cash.
8. *Leverage*: We measure leverage as long-term debt plus debt in current liabilities divided by net assets. If debt is constrained, firms may use their cash to reduce leverage which results in a negative relationship between cash holding and leverage.
9. *Industry cash flow risk (firm sigma)*: We expect firms with greater cash flow risk to hold more precautionary cash. To examine this phenomenon, we divide our sample from the Taiwan Stock Exchange by industry. We measure cash flow risk as the standard deviation of industry cash flow to net assets, computed as follows. For each firm-year, we compute the standard deviation of cash flow to net assets for the previous 10 years. We require at least three observations. We then take the yearly average and standard deviation of firms' cash flows across each industry.
10. *Dividend payout dummy*: We define a dummy variable equal to one in years in which a firm pays a common dividend. Otherwise, the dummy equals zero. The precautionary motive for cash holding is weaker when firms pay dividends.

4.2 Measure of Ownership Structure

Jensen et al. (1976) introduced the "Convergence of Interest Hypothesis" to demonstrate the higher concentration of shareholdings resulting in higher performance with the convergence of cost and gain. The hypothesis argued that higher ownership concentration implies that the interests of managers and their firm tend to be more aligned, leading managers to make efforts to maximize shareholders' wealth; in addition, concentration on boards or controlling shareholders also leads to incentives and oversight encouraging the manager to improve firm performance.

Ji, Cheng, Lee & Lin

On the contrary, Jensen et al. (1983) proposed the “Entrenchment Hypothesis” to note that higher shareholdings of managers lead them to have enough voting rights to maximize their interest. However, Fama’s (1980) study based on market mechanisms concluded on the lack of a relationship between the separation of ownership and operating performance. The paper, assuming a fully efficient market and a perfectly competitive human resource market, found that managers devote themselves to improving performance, which is fully reflected in the stock price.

The variables used to measure ownership structure are as follows:

1. *Ownership concentration*: Ownership concentration is defined as the sum of the shares held by managers, the board of directors and supervisors and the controlling shareholder. Salancik and Pfeffer (1980) found that high ownership concentration led to more information asymmetry because shareholders held much more power over managers and forced managers to enhance stockholder value.
2. *Share Ratio of insiders*: We describe the insider share ratio as the sum of shareholdings of managers and the board of directors and supervisors over total outstanding shares. Yermack (1996) found a positive relationship with firm value because a higher shareholding concentration of insiders leads to stronger management performance incentives.
3. *Share Ratio of managers*: We measured this variable as the shareholdings of managers over total outstanding shares. Managers are defined as high-level managers who possess decision-making power. Morck et al. (1988) found a nonlinear relationship between managers’ shareholdings and firm value; share ratios of managers between 5% and 25% presented a negative relationship, consistent with the “Entrenchment Hypothesis,” and share ratios below 5% or over 25% presented positive relationship and are consistent with the “Convergence of Interest Hypothesis.” However, Singh and Davidson (2003) found a positive relationship between the asset turnover ratio and the degree of managers’ shareholding.
4. *Share Ratio of board of directors and supervisors*: We measured this variable as the shareholdings of the board of directors and supervisors over total outstanding shares. The directors and supervisors are the crucial insiders who dominate firm performance. Hamill, McIlkenny and Opong (2002) found that an increase of shareholdings of board of directors and supervisors send positive signals to shareholders. Kesner (1987) believed that a high shareholding ratio of the board reflected motivations related to financial risk rather than to firm performance.
5. *Share Ratio of Controlling Shareholder*: The Taiwan Stock Exchange defines controlling shareholders as shareholders who own over 10% of the firm’s shares but do not act as the board or supervisor. The data were retrieved from annual reports and prospectuses filed with the Taiwan Market Observation Post System. Shleifer et al. (1986) investigated the relationship between management ownership and the firm’s market value, suggesting that the monitoring power that the majority shareholder has over managers leads managers to maximize shareholder value. In addition, controlling shareholders can effectively address problems of information asymmetry between external shareholders and internal managers through management participation. La Porta et al. (1999) demonstrated the different

effects of voting rights and cash flow rights possessed by the controlling shareholder. Positive incentive effects of cash flow rights are measured by the correlation between the controlling shareholder's interest and firm value. Negative entrenchment effects are measured by the deviation between voting rights and cash flow rights and reflect agency problems that occur when voting rights exceed cash flow rights.

6. *Share Ratio of institutional investors*: We collected the sum of share ratio as institutional investors from government agency, domestic financial institution, trust funds and corporations, other juridical person, foreign financial institution, foreign juridical person and foreign trust fund. Pound (1988) studied the relationships between institutional investors and firm performance, presenting three different hypotheses: 1) the Efficient Monitoring Hypothesis, whereby institutional investors can enhance firm value by effective monitoring managers with their professional knowledge; 2) the Strategic Alignment Hypothesis, whereby the mutual benefit between institutional investors and managers would lead the two parties to cooperate; 3) the Conflict of Interest Hypothesis, that institutional investors may use their informational advantage to protect their interests.
7. *Controlling variables*:
 - 7.1 *Stock Pledging ratio of board of directors and supervisors*: The pledge ratio by board over total outstanding shares. The funds acquired by pledging stock can be used to reinvest in the firm to reinforce controlling power or invest it in other companies to diversify investment risk. The purpose of stock pledging may refer to investing opportunities, speculation in stocks or SEO (secondary equity offering), when the personal discretion with regard to stock pledging results in agency problem, which can be exacerbated during recessions because financial stress may encourage the board of directors and supervisors to exploit minority stockholders and decrease firm performance. However, if the stock pledging is intended to improve investing efficiency, it may not decrease firm performance.
 - 7.2 *Is board director serving as manager*: equals one if the board director serves as manager, zero otherwise. Jensen (1993) argued that a board director serving as manager would leave the company without an independent leader, which may result in a serious agency problem arising from the impossibility of monitoring high-level managers.
 - 7.3 *Pyramid Structure/ Cross-holdings*: The dummy reflecting pyramids with ultimate owners (when companies are not widely held) equals one if the controlling owner exercises control through at least one publicly traded company and zero otherwise. The dummy reflecting cross-holdings equals one if the company has a controlling shareholder and owns any amount of shares in its controlling shareholder or in another company in that chain of control and zero otherwise. La Porta et al. (1999) indicated that controlling shareholders can hold a controlling power over a company via pyramid structures and cross-holdings in addition to direct share holdings. Claessens et al. (2000) also found that pyramid structures, cross-holdings and exchange of board allow controlling shareholders to have substantial power to exploit minority shareholders through the unreasonable excess of voting rights over cash flow rights. Lemmon et al. (2003) studied 800 listed firms in Asia and discovered that high ownership concentration encourages

insiders to use pyramid structures and cross-holdings to strengthen their controlling power.

7.4 *Excess cash holdings*: Excess cash holdings were defined as the deviation between real cash holdings and expected cash holdings. Our regressions use both estimated statistics and a dummy variable. Excess cash holdings equals one for each firm year if it is greater than zero and zero otherwise.

4.3 Measure of Firm Performance

Firm performance is the main independent variable of the research. Previous studies have found contradictory relationships between ownership structure and firm performance. We thus assume that different definitions of performance lead to these conclusions. In the regression, we use two different measures as our dependent variables to estimate the effect of ownership structure and excess cash holdings. The firm performance measures were divided between a growth opportunity measure, Tobin's Q, and an accounting performance measure, Return on Assets (ROA).

ROA depicts traditional accounting performance and is capable of measuring past and current operating performance. However, Tobin's Q is used to explain future growth opportunity and prospects and measures expected future performance.

We use the market-to-book ratio as Tobin's Q and calculate the book value of assets minus the book value of equity plus the market value of equity as the numerator of the ratio and the book value of assets as the denominator. ROA is defined as a return ratio and is measured by dividing net income after taxes but before interest over total assets. Definitions of all the variables are summarized in Table1:

Table1: Variable Definitions

The table describes the definition of variables used in the paper.

Variable name	Definition
Cash Holding Equation	
Cash Holding(<i>CASH</i>)	Cash/net assets
Firm Size(<i>SIZE</i>)	Natural logarithm of the book value of assets in 2006 dollars
Growth Opportunity (<i>TobinsQ</i>)	Book value of assets less book value of the equity, plus the market value of the equity, divided by book value of the assets
Total Leverage (<i>LEVERAGE</i>)	The sum of long-term debt and short-term debt, divided by total assets
Cash Flow (<i>CASHFLOW</i>)	Earnings before extraordinary items, plus depreciation and amortization divided by assets
Net Working Capital(<i>NWC</i>)	Current assets minus current debt, cash and marketable securities, divided by net assets
Invest (<i>INVEST</i>)	Capital expenditure divided by assets
R&D(<i>RD</i>)	Research and development spending divided by sales
Dividend Dum(<i>DIVIDEND</i>)	Takes the value 1 if the firms pay dividends in that year and 0 otherwise
FirmSigma (<i>FIRMSIGMA</i>)	Volatility of a firm's cash flow over time
ROA(<i>ROA</i>)	Net income after taxes and before interest, divided by total assets

Table1 (Continued)
Variable Definitions

Ownership Structure	
Ownership concentration (<i>CONCENTRATION</i>)	The sum of the share held by managers, the board of directors and supervisors and the controlling shareholder
Insider (<i>INSIDER</i>)	The sum of shareholdings of managers and the board of directors and supervisors over total outstanding shares
Managers(<i>MANAGER</i>)	Shareholdings of managers over total outstanding shares.
Board of directors and Supervisors (<i>BOARD</i>)	Shareholdings of board of directors and supervisors over total outstanding shares.
Controlling Shareholder (<i>CONTROLLING</i>)	Shareholder who owns over 10% of shares but is not a board member or manager
Institutional investors (<i>INSTITUTE</i>)	The sum of the share ratio for government agencies, domestic financial institutions, domestic trust funds, domestic corporations, other juridical people, foreign financial institutions, foreign juridical people and foreign trust funds
Stock Pledging ratio of board of directors and supervisors(<i>PLEDGING</i>)	The pledge ratio by board over total outstanding shares.
Pyramids Structure (<i>PYRAMIDS</i>)	Equals 1 if the controlling owner exercises control through at least one publicly traded company, 0 otherwise
Cross-holdings (<i>CROSSdum</i>)	Equals 1 if the company has a controlling shareholder and owns any amount of shares in its controlling shareholder or in another company in that chain of control, 0 otherwise
Is board director serving as manager(<i>BOARDMANAGER</i>)	Equals 1 if board director serving as manager, 0 otherwise.
Excess cash holdings(<i>EXCASH/EXCASHdum</i>)	The deviation between real cash holdings and expected cash holdings. Equals 1 for each firm year if greater than zero, 0 otherwise

4.4 Hypotheses

Our research investigates three main subjects: 1) the relationship between ownership structure and operating performance; 2) the relationship between ownership structure and operating performance in the context of the firm's holding excess cash; 3) the relationship between ownership structure and operating performance in the context of the firm's holding excess cash and the presence of cross-holdings. For a better description for the utilization of excess cash, we use two different definitions of operating performance, ROA, which represents current performance, and Tobin's Q, which represents future performance, to identify the influence of excess cash holdings on these financial indicators.

Dittmar et al. (2003) proved that cash holdings have a significant positive effect on the Market-to-Book ratio because a higher M-B ratio implies more investment opportunities and future prospects. Therefore, we assume that the policy among

Taiwanese firms of holding excess cash is intended to exploit investment opportunities and enhance the growth opportunity measure, Tobin's Q. However, the low return rate of cash holdings on hand should decrease the current financial indicator, ROA, because it only meets daily expense or unexpected needs. A high ROA with excess cash on hand may be regarded as a result of unusual liquidity manipulation. Consequently, we define the agency problem as the condition fitting the above description.

Our research tests the following hypotheses:

- H1:** Ownership structure has a significant relationship with the utilization of excess cash, which indicates differing effects on current and future operating performance.
- H1-1:** Higher controlling shareholder share ratios align interests between stockholders and managers and thus lower the agency problem of excess liquidity.
- H1-2:** A higher manager share ratio strengthens managers' power to consume the firm's resources through unnecessary expenses and non-profitable investments, thus increasing the agency problem of excess liquidity.
- H1-3:** A higher board of directors and supervisors share ratio increases the alignment between their interest and performance, thus lowering the agency problem of excess liquidity.
- H1-4:** A higher institutional investors share ratio provides a stronger monitoring motivation, thus lowering the agency problem of excess liquidity.
- H1-5:** A board director's serving as a manager increases the agency problem of excess liquidity
- H1-6:** A higher stock pledging ratio among the board of directors and supervisors increases the agency problem of excess liquidity.

We assume that a higher ownership concentration should align shareholders' interests and performance and that the shareholdings of institutional investors provide the motivation to monitor the company.

5. Cash Holding and Ownership Structure in Taiwan

5.1 The Increase in Cash Holdings

Table 2 reports average and median cash and leverage ratios from 2001-2009. We measure the cash ratio as cash and marketable securities divided by net assets. Column 1 of Table 2 summarizes the median cash ratio for the sample firms. This ratio is 8.92% in 2001 and peaks at 16.80% in 2009. Column 2 depicts the same trend in average cash ratio for the sample firms by year. This ratio increases from 17.48% in 2001 to a peak of 26.15% in 2009. Column 3 discusses the standard deviation of the cash ratio, which ranges from 22.33% to 35.74%. Considering the leverage ratio, we obtain a relatively different perspective regarding the time trend in Taiwan's firms. Column 4-6 of Table 2 reports leverage for our sample firms by year. We measure debt as long-term debt plus debt in current liabilities, divided by book assets. The median leverage increases to a peak of 47.43% in 2005 and falls under 45% during the period 2006-2009. The average leverage fluctuated during these 9 years, reaching a low point of 43.98% in 2001 and peaking at 46.27% in 2005. The

standard deviations range from 15.93% to 18.05%

Table 2: Average and Median Cash and Leverage Ratios from 2001-2009

The table presents cash holding and leverage statistics include our sample of firm-year observation from 2001-2009. Variable definitions are provided in Table 1.

Year	N	Cash ratio			Leverage		
		Median	Mean	Std.	Median	Mean	Std.
2001	4572	8.92%	17.48%	27.81%	44.65%	43.98%	16.03%
2002	4572	9.99%	19.80%	35.74%	44.38%	44.89%	15.93%
2003	4572	11.67%	21.24%	34.17%	46.03%	45.84%	16.04%
2004	4572	11.35%	19.77%	30.93%	47.33%	46.16%	16.63%
2005	4572	12.69%	20.34%	30.85%	47.43%	46.27%	17.57%
2006	4572	13.59%	21.87%	32.66%	45.70%	45.02%	18.00%
2007	4572	13.98%	21.94%	34.76%	44.99%	44.06%	17.22%
2008	4572	14.01%	20.78%	22.33%	45.01%	44.60%	18.05%
2009	4572	16.80%	26.15%	29.33%	42.15%	42.78%	17.78%

Table 3: Average Cash and Leverage Ratio by Industry from 2001-2009

The table presents cash holding statistics across industries. The statistics are calculated during the period of 2001-2009 and the industry is defined according Taiwan Stock Exchange. Variable definitions are provided in Table 1

Industry descriptions	N	Cash ratio Mean	Leverage Mean
Panel A: Top 5 industries			
Information Services	81	64.57%	37.46%
Semiconductor	279	46.68%	33.36%
Computer and Peripheral Equipment	351	33.72%	45.56%
Biotechnology & Medical Care	72	28.82%	34.05%
Communications and Internet	153	27.88%	39.92%
Oil, Gas and Electricity	63	25.53%	43.69%
Other Electronic	162	23.68%	41.61%
Chemical	180	23.64%	37.89%
Electronic Parts & Components	396	23.40%	43.22%
Automobile	36	21.73%	43.68%
Panel B: Bottom 5 industries			
Trading and Consumers' Goods	90	15.65%	37.89%
Tourism	54	15.59%	43.22%
Electronic Products Distribution	126	14.16%	41.67%
Rubber	81	13.75%	43.69%
Paper and Pulp	63	12.09%	43.68%
Foods	180	10.97%	44.04%
Textiles	405	9.96%	44.23%
Glass and Ceramics	45	9.43%	43.87%
Building Material and Construction	315	8.85%	57.64%
Iron and Steel	225	7.89%	50.66%

5.2 Diverse Industrial Cash Holdings

Table 3 shows cash holdings by industry. The top 10 industries (panel A) indicate the greater cash needs among information or electronic technology-related industries. The difference between the highest and lowest average cash ratio can be 56.68% (64.57%-7.89%). However, the leverage ratio is relatively stable compared to the drastic variance in cash ratios among Taiwan's firms. The large industry variation in

cash holding indicates that controlling for industry effects is crucial for the purpose of our analysis.

5.3 Why Firms Hold Cash

The expected liquidity level is estimated by the equation developed by Opler et al. (1999), where the independent measure is noted as cash/net assets ratio. Data requirements limit the size of our sample. The unrestricted sample contains 6,669 observations during 2001-2009, but only 4,572 observations have sufficient data to estimate the regression. We report our regression results in Table 4, and the definitions of variables refer to Table 1. Given our data restriction, the panel consists of 4,572 firm-year observations for 508 independent firms.

The regression results indicate similar empirical estimates, with Opler et al. (1999) panel regressions predicting liquidity levels in the period 1971-1994. The R^2 of the regression is 81.73%. The Variance Inflation Factor (VIF) test results, all of which are under 4, leaves the problem of multicollinearity. The significant negative relationships of SIZE, NWC, INVEST and LEVERAGE for the cash ratio have a P-value under 0.01. The significant positive relationships of TOBINSQ, CASHFLOW, RD and DIVIDEND on the cash ratio have P-values under 0.01, and FIRMSIGMA has a P-value under 0.10.

The following coefficients explain the motives leading firms to maintain their cash holdings. SIZE, NWC, INVEST and LEVERAGE indicate a significant negative effect on cash holding, whereas TOBINSQ, CASHFLOW, RD, FIRMSIGMA present significant positive effects. The coefficients whose results do not correspond with previous expectations are INVEST and DIVIDEND.

Bates et al. (2008) explained the negative relationship with the cash ratio that capital expenditures may consume cash due to being more likely to generate assets that can be used as collateral for financing. The positive relationship with the cash ratio of DIVIDEND shows that the precautionary motive is applicable for dividend payout.

Table 4: Opler et al. Regression Estimation of the Determinants of Cash Holdings

Determinants of cash holdings on firm's cash holdings, 2001-2009. The regression follows the variables using Opler et al. (1999) method. Variables are defined in Table 1.

	Coefficient	Std. Error	t-Statistic	Prob.	VIF
INTERCEPT	0.620609	0.108081	5.742066	0.0000	
SIZE	-0.022338	0.007289	-3.06475	0.0022	1.190974
TOBINSQ	0.070648	0.003025	23.35299	0.0000	1.269957
CASHFLOW	0.266568	0.026534	10.04635	0.0000	1.291167
NWC	-0.490339	0.023455	-20.9057	0.0000	1.386691
RD	0.012567	0.001421	8.842598	0.0000	1.534408
INVEST	-0.115724	0.020586	-5.6216	0.0000	1.228984
LEVERAGE	-0.398879	0.032407	-12.3084	0.0000	1.529524
FIRMSIGMA	0.532024	0.28334	1.877684	0.0605	1.301494
DIVIDEND	0.019234	0.007085	2.714761	0.0067	1.283526
N	4572				
R^2	0.817296				
Adj. R^2	0.794047				

5.4 Growing Ownership Concentration in Taiwan

Table 5 reports the average ownership structure measures from 2001-2009. Column 3, CONCENTRATION, represents ownership concentration, which consists of the shareholding ratio of insiders and controlling shareholders. We observe that this measure increases from 40.45% to a peak of 42.78%. We also observe a growing ownership of the controlling shareholder from 13.60% to 19.47% and a declining in insider shareholdings from 26.85% to a minimum of 23.22%.

Table 5: Average Ownership Structure from 2001-2009

The table presents ownership structure average statistics include our sample of firm-year observation from 2001-2009. Variable definitions are provided in Table 1.

Year	N	CONCENTRATION	INSIDER	MANAGER	BOARD	CONTROLLING	INSTITUTE
2001	4572	40.45%	26.85%	0.65%	26.19%	13.60%	34.64%
2002	4572	40.06%	25.54%	0.61%	24.93%	14.53%	35.86%
2003	4572	42.68%	24.74%	0.96%	23.78%	17.94%	35.46%
2004	4572	42.77%	22.95%	0.89%	22.06%	19.82%	39.82%
2005	4572	42.77%	22.95%	0.89%	22.06%	19.82%	39.82%
2006	4572	41.99%	23.22%	0.91%	22.31%	18.77%	38.65%
2007	4572	42.35%	22.88%	0.93%	21.96%	19.47%	40.57%
2008	4572	42.77%	22.95%	0.89%	22.06%	19.82%	39.82%
2009	4572	42.78%	22.74%	0.87%	21.87%	20.04%	38.28%

Column 4, the INSIDER measure, represents the shareholding ratio of managers and the board of directors and supervisors. Columns 5 and 6 show the opposite trend among insider shareholdings. Whereas managers' shareholdings rise dramatically from 0.65% in 2001 to 0.96% in 2003, then remain beyond 0.87%, shareholdings of the board of directors and supervisors decrease from a peak of 26.19% in 2001 to a low of 21.06% in 2008. The share ratio of institutional investors shows a stable increase, similar to ownership concentration.

6. Empirical Results

6.1 Descriptive Statistics

Table 6 reports the summary statistics for ownership structure and excess cash holdings measures for the firms in our sample. Ownership structure measures ownership concentration, the shareholdings of insiders, the board of directors and supervisors, the controlling shareholder and institutional investors, which present extreme opposing results. Ownership concentration, which represents the shareholding ratio of insiders and the controlling shareholder, shows an average of 41.64% but a minimum of 0.53% and a maximum of 98.47%. The insider shareholding ratio shows an average of 23.95%, a minimum of 0.19% and a maximum of 95.33%, the controlling shareholding ratio presents a lower average of 17.69%, a minimum of 0% and a maximum of 79.46%. The share ratio of the board of directors and supervisors ranges from a minimum of 0.13% to a maximum of 95.33% with an average of 23.09%. The share ratio of institutional investors present similar ranges from a minimum of 0% to a maximum 98.39% with an average of 37.39%. The standard deviations of these measures indicate relative stability over time.

Ji, Cheng, Lee & Lin

Within ownership concentration, the average insider shareholding ratio is higher than that of the controlling shareholder. The share ratio of the board of directors and supervisors also represents the majority of insider ownership compared to the share ratio of managers, even though Table 5 shows an increase in ownership among managers

Excess cash holdings are defined as the deviation of the real cash ratio from the estimated cash ratio. The average of this difference is close to zero, which proves that the estimated regression can be used to describe the reality. We will use the positive excess cash as the variable "excashdum" in our estimation.

The average pyramid structure measure indicates that 28.6% of firms exercise control through at least one publicly traded company. However, the average of the dummy of cross-holdings indicates that 40.8% firms hold stock in two or more publicly traded companies. Finally, the board of directors serve as managers in 29.1% of firms.

Table 6: Excess Cash holdings and Ownership Characteristics from 2001-2009

The table presents excess cash holdings and ownership structure statistics in our sample of 4572 firm-year observations from 2001-2009. Variable definitions are provided in Table 1.

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
CONCENTRATION	41.643	40.110	98.470	0.530	16.501
INSIDER	23.950	21.225	95.330	0.190	13.742
MANAGER	0.855	0.140	23.140	0.000	2.082
BOARD	23.095	20.190	95.330	0.130	13.627
CONTROLLING	17.693	16.215	79.460	0.000	11.587
INSTITUTE	37.399	34.890	98.390	0.000	22.431
PLEDGING	13.870	0.510	100.000	0.000	21.742
BOARDMANAGER	0.291	0.000	1.000	0.000	0.454
PYRAMIDS	0.286	0.000	1.000	0.000	0.452
CROSSdum	0.408	0.000	1.000	0.000	0.491
CASH	0.210	0.130	6.120	0.000	0.313
EXCASH	0.000	-0.030	4.210	-1.300	0.249

6.2 Regression Evidence

We report our initial regression results in Table 7. Data requirements limit the size of our sample; the unrestricted sample has 6,669 observations during 2001-2009, but only 4,572 observations contain enough data to estimate the regression. Given our data restriction, the panel consists of 4,572 firm-year observations for 508 independent firms.

The Redundant Fixed Effect test and the Hausman test prove that the models using a fixed effect are appropriate. Model 1-6 shows the estimations of the regression using ownership structure variables and other controlling variables, such as the stock pledging ratio of the board of directors and supervisors, the pyramid structure, cross-holdings, the board director serving as a manager and excess cash holdings, to examine performance effects in terms of ROA and Tobin's Q. Model 7-12 present the same regression result using only the case of positive excess cash and can be interpreted as another explanation to test the ownership structure impact on the Taiwanese firms' cash management.

Ji, Cheng, Lee & Lin

Cash is a readily available source of assets to manage daily needs, but excess cash holdings imply lower returns on assets. The regression results present a significant positive effect of cash on firm performance in terms of both ROA and Tobin's Q; however, excess cash holdings present a significant negative effect, especially in terms of ROA. This result reveals that excess cash does not enhance value in terms of current performance or investment opportunities, that a one-percent increase in excess cash decreases ROA by approximately -18.7 percent, and that a one-percent increase in excess cash decreases Tobin's Q by approximately -6.67 percent. Controlling the situation of positive excess cash holdings, the coefficient indicates when we move from the average value of Excess Cash Dummy of 0 to a value of 1, the negative effect even offsets the positive benefit brought from cash: in Model 9, ROA decreases by $-3.28875 (15.51032 + (-18.79907) = -3.28875)$, a similar but less pronounced result is found for Tobin's Q. The difference result between ROA and Tobin's Q ($17.03824 - 6.697528 = 10.340712$) implies that firms use their cash for current performance, with the benefit reflecting current but not future performance. Because the return rate of cash holdings is low, the reason why firms hold cash is to address daily expenses or unexpected needs; therefore, excess cash holdings are not beneficial but detrimental to the company.

The myopic behavior of these firms can be demonstrated by observing the components of ownership concentration. The coefficient of ownership concentration is defined as the sum of the share held by managers, the board of directors and the supervisor and controlling shareholder. This regression shows that the ownership concentration has a positive effect on ROA but a negative effect on Tobin's Q, implying that a high ownership concentration indeed solves the problem of information asymmetry and aligns stockholders' and managers' interests but only in the case of current performance.

Corresponding with the expectation of the positive effect of ownership concentration on ROA, Models 2, 5, 8 and 11 indicate that the shareholdings of insiders and controlling shareholders both show significant positive relationships. This result confirms the positive incentive effects proposed by La Porta et al. (1999) and the Convergence of Interest Hypothesis proposed by Jensen et al. (1976). However, because shareholdings of insiders and controlling shareholders both show significant negative relationships with Tobin's Q, the model proves the negative entrenchment hypothesis. Shareholdings present a positive effect on ROA but not Tobin's Q, suggesting that insiders value current wealth but not future prospects more highly. Therefore, this result may refer to myopic corporate behavior and confirm that insiders may pursue their own interest and make the unfavorable decision to exploit the minority shareholders rather than to grow the firm. In the context of positive excess cash holdings, controlling shareholders appear not to have an obvious influence on cash utilization, and the shareholdings of insiders present a significant positive effect on only ROA.

For further discussion on insider shareholdings, in Models 3, 6, 9 and 12, we define insiders as managers and the board of directors and supervisors. This estimation yields more details on insiders' effect on firm performance. Whereas the shareholdings of managers have an insignificant relationship with both ROA and Tobin's Q, the boards of directors and supervisors shareholdings a significant positive effect on ROA. This finding may imply that the Convergence of Interest

Ji, Cheng, Lee & Lin

Hypothesis is only applicable for boards of directors and supervisors. This regression shows that the board of directors and supervisors possesses dominant power over managers in a firm and conduct funding operations. The negative effects on Tobin's Q verify the implication of corporate myopic behavior. The board of directors and supervisors or controlling shareholders may request that managers focus on present performance rather than on investing opportunities and may also influence the cash application policy as well.

The only significant positive effect on both ROA and Tobin's Q appears in the case of institutional investors, a finding that is in line with Pound's (1988) Efficient Monitoring Hypothesis and Strategic Alignment Hypothesis. The abundant resources of institutional investors enable them to hold large shares against a firm; therefore, it provides a strong motivation for them to monitor the operation and decision-making. Their professional ability and solid information allow institutional investors to oversee management with lower monitoring costs. Karathanassisa and Drakos (2004) also found a positive effect on Tobin's Q in research in the Greek context.

The stock pledging of board of directors and supervisors has a negative effect on ROA. Whenever a firm is running a corporate deficit or under selling pressure, it is possible for board of directors and supervisors to use their controlling power to exploit the firm's assets or manipulate earnings to support their personal financial distress. The stock pledging behavior also induces these board of directors and supervisors to pay too much attention to the stock market rather than monitoring corporate operations. In addition, pledging stock to invest in other companies signals the pessimistic prediction over the company and causes inefficiency in operations or policy execution.

On the other hand, stock pledging has a positive effect on Tobin's Q, which may reflect the ability of the board of directors and supervisors to receive more pertinent information and to recognize good investment opportunities and thus their incentive to pledge their stock to fund more capital to improve the efficiency of investment policy. This phenomenon implies that their stock pledging behavior will not necessarily decrease firm performance. Furthermore, stock pledging behavior will not affect future value because it prevents the stock equity from the dilutive effect of seasoned equity offerings.

The presence of a director among the management demonstrates a significant negative relationship to ROA and a negligible relationship with Tobin's Q. The results show that a board director's serving as a manager implies the deficiency of independent supervision and management, resulting in a serious agency problem where directors' secured power allows them to manipulate stockholder wealth.

Table 7: Regression Estimating the Determinants of Excess Cash Holdings

Effects of ownership structure and excess cash holdings on firm performance, 2001-2009. Dependent variables are described as two measures: a growth opportunity measure, Tobin's Q, and an accounting performance measure, Return on Assets (ROA). Financial firms are excluded from the sample, yielding a panel of 4572 observations for 508 listed firms. Independent variables are defined in Table 1. T-statistics are reported in parentheses. ***, ** and * indicate significance at the 1%, 5%, 10% levels, respectively.

Model	1	2	3	4	5	6
Dependent Variable	ROA	ROA	ROA	TOBINSQ	TOBINSQ	TOBINSQ
INTERCEPT	-2.04061 (-4.19)***	-2.74899 (-4.59)***	-2.72744 (-4.56)***	0.049032 (-0.88)	0.130312 (2.26)**	0.127300 (2.20)**
CONCENTRATION	0.053876 (4.95)***			-0.007201 (-6.84)***		
INSIDER		0.074519 (5.00)***			-0.012094 (-8.41)***	
MANAGER			-0.04773 (-0.69)			0.004992 (0.75)
BOARD			0.077780 (5.19)***			-0.012550 (-8.67)***
CONTROLLING		0.042767 (3.51)***	0.042558 (3.50)***		-0.004568 (-3.89)***	-0.004538 (-3.86)***
INSTITUTE	0.053188 (5.31)***	0.054305 (5.41)***	0.053773 (5.36)***	0.005637 (5.81)***	0.005372 (5.55)***	0.005446 (5.63)***
PLEDGING	-0.026730 (-3.78)***	-0.02646 (-3.74)***	-0.02616 (-3.70)***	0.001955 (2.86)***	0.001893 (2.77)***	0.001850 (2.71)***
BOARDMANAGER	-0.728140 (-2.12)**	-0.75446 (-2.19)**	-0.72421 (-2.10)**	-0.038908 (-1.17)	-0.032667 (-0.984)	-0.036896 (-1.11)
PYRAMIDS	-1.060059 (-2.06)**	-1.17094 (-2.19)**	-1.12406 (-2.19)**	-0.047568 (-0.96)	-0.034048 (-0.69)	-0.033074 (-0.67)
CROSSdum	-0.730397 (-2.19)**	-0.67859 (-2.03)**	-0.65578 (-1.96)**	0.027915 (0.87)	0.015635 (0.49)	0.012447 (0.39)
CASH	16.97423 (15.54)***	16.98604 (15.56)***	17.03824 (15.6)***	6.707621 (63.27)***	6.704823 (63.63)***	6.697528 (63.58)***
EXCASH	-18.78666 (-14.96)***	-18.7908 (-14.97)***	-18.8093 (-14.99)***	-6.677527 (-54.97)***	-6.676531 (-55.12)***	-6.673974 (-55.14)***
N	4572	4572	4572	4572	4572	4572
R ²	0.565587	0.566028	0.566380	0.810555	0.811709	0.812029
adj. R ²	0.510429	0.510805	0.511081	0.786501	0.787749	0.788058
D-W stat	1.62	1.62	1.62	1.16	1.18	1.18
Redundant FE test	7.528***	7.537***	7.544***	10.587***	10.582***	10.551***
Hausman test	104.124***	105.914***	108.758***	71.388***	75.009**	72.049***

Table 7 (Continued): Regression Estimating the Determinants of Excess Cash Holdings

Effects of ownership structure and excess cash holdings on firm performance, 2001-2009. Dependent Variables are described as two measures: a growth opportunity measure, Tobin's Q, and an accounting performance measure, Return on Assets (ROA). Financial firms are excluded from the sample, yielding a panel of 4572 observations for 508 listed firms. Independent variables are defined in Table 1. T-statistics are reported in parentheses. ***, ** and * indicate significance at the 1%, 5%, 10% levels, respectively.

Model	(EXCASHdum=1)					
	7	8	9	10	11	12
Dependent Variable	ROA	ROA	ROA	TOBINSQ	TOBINSQ	TOBINSQ
INTERCEPT	1.323583 (1.45)	0.122518 (0.127)	0.086352 (0.09)	0.269101 (3.07)***	0.394314 (4.27)***	0.398366 (4.32)***
CONCENTRATION	0.014874 (0.78)			-0.003524 (-1.94)*		
INSIDER		0.080846 (3.17)***			-0.010404 (-4.25)***	
MANAGER			-0.048334 (-0.55)			0.004072 (0.48)
BOARD			0.084411 (3.30)***			-0.010804 (-4.40)***
CONTROLLING		-0.022486 (-1.06)	-0.024551 (-1.16)		0.000368 (0.18)	0.000600 (0.29)
INSTITUTE	0.050404 (3.47)***	0.058161 (3.98)***	0.059368 (4.06)***	0.008977 (6.43)***	0.008169 (5.82)***	0.008033 (5.72)***
PLEDGING	-0.01465 (-1.78)	-0.14609 (-1.18)	-0.013213 (-1.06)	-0.000508 (-0.42)	-0.000513 (-0.43)	-0.000669 (-0.56)
BOARDMANAGE R	-0.57373 (-1.12)	0.560821 (-1.10)	-0.483578 (-0.94)	-0.066863 (-1.36)	-0.068209 (-1.39)	-0.076865 (-1.56)
PYRAMIDS	0.346303 (0.47)	0.109656 (0.15)	0.138418 (0.19)	-0.104451 (-1.48)	-0.079780 (-1.13)	-0.083003 (-1.18)
CROSSdum	-0.68212 (-1.35)	-0.555368 (-1.11)	-0.500480 (-0.99)	-0.001633 (-0.03)	-0.014847 (-0.31)	-0.020998 (-0.43)
CASH	15.39130 (9.55)***	15.49719 (9.66)***	15.51032 (9.67)***	5.243138 (33.86)***	5.232100 (33.98)***	5.230628 (34.00)**
EXCASH	-18.60536 (-9.15)***	-18.83439 (-9.31)***	-18.79907 (-9.29)***	-4.872832 (-24.96)***	-4.848955 (-24.97)***	-4.852913 (-25.01)**
N	1807	1807	1807	1807	1807	1807
R ²	0.741259	0.743912	0.744328	0.880859	0.882298	0.882559
adj. R ²	0.673454	0.676577	0.676877	0.849638	0.851350	0.851576
D-W stat	1.48	1.50	1.51	1.71	1.73	1.73
Redundant FE test	7.846***	7.962***	7.976***	6.747***	6.687***	6.627***
Hausman test	26.473***	32.690***	34.729***	57.774***	48.619***	47.446***

7. Conclusion

7.1 Conclusion

The research examines the argument that large cash holdings indicate strong preparation for valuable investing opportunities or imply an inducement for controlling shareholders to transfer liquidity resources for their own interest, leading their company not to be able to fully use its resources in pursuit of investment opportunities.

Most firms are facing the dilemma of determining the optimal level of cash holdings. A high enough liquidity level enables firms to protect themselves from financial crisis

and ensures that firms have enough funds to pursue profitable investment opportunities. However, excess cash holdings imply lower returns on assets and inefficient capital utilization an agency problem then emerges through the different points of view regarding the ideal level of cash holdings because an inappropriate cash management policy can dramatically decrease firm value.

In the empirical study, we confirmed that cash demonstrates a positive effect on both current and future performance, whereas excess cash holdings appear to present great damage to firm value. The study reveals that cash does help to meet daily financial needs and drive firms to growth but that excess cash holdings do not benefit firms through its presumed ability to generate value from future profitable investments. The negative effect of excess cash holdings on firm performance indicates an adverse effect caused by the inefficient policy of holding too much cash on hand and offsets the positive benefit brought by the use of cash. This result indicates that firms that do not employ their cash fully and effectively may face inefficiency. When a firm employs cross-holdings, the negative effect of excess cash holdings is dramatically different from the positive effect of cash, supporting our belief that the use of cross-holdings may be a driver of inefficient cash management.

Regarding the observation of each component within the overall ownership structure, the empirical results correspond with Pound's (1988) efficient monitoring hypothesis and strategic alignment hypothesis among institutional investors. The study also reveals that, along with the consolidation of ownership concentration, current performance is increasing while future performance is decreasing, reflecting that corporate insiders and controlling shareholders are engaging in managerial myopic behavior. The results of further examination of corporate insiders, who consist of managers and the board of directors and supervisors, reveal the opposing point of view that the shareholdings of managers have no effect on corporate performance but that the shareholdings of board of directors and supervisors have a significant effect on firm value. Our empirical estimates report that the board of directors and supervisors place more emphasis on current value and likely have much more power over managers to direct the cash utilization policy. This agency problem evidently proves the necessity of an independent role such as an independent director, to provide monitoring power to corporate management.

7.2 Research Restriction and Further Study Suggestion

Our research has presented a general idea of the relationship between ownership structure and excess cash holdings. However, the industry to which a firm belongs is an important factor that must be considered for further study.

The dramatic deviations shown in Table 3 present another story that different industries may have their own optimal cash holding policies. The great cash demand among information or electronic technology-related industries can be attributed to the industrial characteristics, especially the industrial cycle. Consequently, high cash holdings can be interpreted as being necessary for the prevention of industry-level shocks.

However, different industries may employ different ownership structures, rendering it difficult to apply our conclusion for each single industry.

In addition, this study does not consider the types of ownership cross-holdings. The structure of cross-holdings may be a driver of inefficient excess cash management.

References

- Bates, TW, Kahle, KM & Stulz, RM 2008, 'Why do U.S. firms hold so much more cash than they used to?', *The Journal of Finance*, vol. 64, pp. 1985-2021.
- Berle, A & Means, G 1932, 'The modern corporation and private property', MacMillan, New York, N.Y.
- Blanchard, O, Lopez-de-Siklanes, F & Shleifer, A 1994, 'What Do Firms Do with Cash Windfalls?', *Journal of Financial Economics*, vol. 36, pp. 337-60.
- Claessens, Djankov, & Lang 2000, 'The separation of ownership and control in East Asian corporations', *Journal of Financial Economic*, vol. 58, pp. 81-112.
- Dittmar, A & Mahrt-Smith, J & Servaes, H 2003, 'International corporate governance and corporate cash holding', *Journal of Financial and Quantitative Analysis*, vol. 38, pp. 111-133.
- Dittmar, A & Mahrt-Smith, J 2007, 'Corporate governance and the value of cash holding', *Journal of Financial Economics*, vol. 83, pp. 599-634.
- Fama, EF 1980, 'Agency problems and the theory of the firm', *Journal of Political Economy*, vol. 88, pp.288-307.
- Fama, EF & MacBeth, J 1973, 'Risk, Return and Equilibrium: Empirical Tests', *Journal of Political Economy*, vol. 81, pp. 607-636
- Hamill, PA, McIlkenny, P & Opong. KK 2002, 'Directors' share dealings and company financial performance', *Journal of management & Governance*, vol. 6, no.3, pp. 215-234.
- Harford, J 1999, 'Corporate Cash Reserves and Acquisitions', *Journal of Finance*, vol. 54, pp.1969-1997.
- Harford, J & Haushalter, D 2000, 'Cash Flow Shocks, Investment, and Financial Constraint: Evidence from a Natural Experiment', Unpublished Paper, Univ. of Oregon.
- Jensen, MC & Meckling, WH 1976, 'Theory of the firm: Managerial behavior, agency costs and ownership structure', *Journal of Financial Economics*, vol. 3, no. 4, pp. 305-360
- Jensen, MC 1986, 'Agency costs of free cash flow, corporate finance, and takeovers', *American Economic Review*, vol. 76, pp. 323-329.
- Jensen, MC & Ruback, RS 1983, 'The market for corporate control : The scientific evidence', *Journal of Financial Economics*, vol. 11, pp. 5-50
- Karathanassisa, GA & Drakos, AA 2004, 'A Note on Equity ownership and Corporate Value in Greece', *Managerial and Decision Economics*, vol. 25, pp. 537-547
- Kesner 1987, 'Directors' stock ownership and organizational performance : An Investigation of Fortune 500 companies', *Journal of Management*, vol.11, no.3, pp.499-507
- Kusnadi, Y 2003, 'Corporate Cash holding and Corporate Governance Mechanisms', Working paper, Hong Kong University of Science and Technology.
- La Porta, R, Lopez-de-Silanes, F & Shleifer, A 1999, 'Corporate Ownership Around the World', *The Journal of Finance*, vol. 54, no. 2, pp. 471-517
- Liao, TH 2011, 'Taiwan Enterprises Empirical Study of Motivation in Cash Holding', National Chung Cheng University, Department of Economics, Working Paper.

Ji, Cheng, Lee & Lin

- Lins, KV 2003, 'Equity Ownership and Firm value in Emerging Markets', *Journal of Financial and Quantitative Analysis*, vol. 38, pp. 159–184.
- Harford, M, Mansi, S & Maxwell, WF 2008, 'Corporate governance and firm cash holding in the US', *Journal of Financial Economics*, vol. 87, pp. 535-555.
- Mikkelson, WH, Partch, MM & Shah, K 1997, 'Ownership and operating performance of companies that go public', *Journal of Financial Economics*, vol. 44, pp. 281-307.
- Mikkelson, WH & Partch, MM 2003, 'Do Persistent Large Cash Reserves Hinder Performance?', *The Journal of Financial and Quantitative Analysis*, vol.38, no.2, pp.275-294
- Morck, R, Shleifer, A & Vishny, RW 1988, 'Management Ownership and Market Valuation: An Empirical Analysis', *Journal of Financial Economics*, vol. 20, pp. 193-315.
- Myers, SC & Majluf, NS 1986, 'Corporate Financing and Investment Decisions when Firms Have Information that Investors Do Not Have', *Journal of Financial Economics*, vol. 13, pp. 1878-221.
- Myers, SC & Rajan, RG 1998, 'The Paradox of Liquidity,' *The Quarterly Journal of Economics*, vol. 113, no. 3, pp. 733-771
- Ozkan, A & Ozkan, N 2004, 'Corporate cash holding: An empirical investigation of UK companies', *Journal of Banking & Finance*, vol. 28, pp.2103–2134
- Opler, T, Pinkowitz, L, Stulz, RM & Williamson, R 1999, 'The determinants and implications of corporate cash holding', *Journal of Financial Economics*, vol. 52, pp. 3-46.
- Papaioannou, GJ, Strock, E & Travlos, NG 1992, 'Ownership structure and corporate liquidity policy', *Managerial and Decision Economics*, vol. 13, no. 4, pp. 315-322
- Pound, J 1988, 'Proxy Contests and the Efficiency of Shareholder Oversight', *Journal of Financial Economics*, vol. 20, pp. 237-265.
- Salancik, GR & Pfeffer, J 1980, 'Effects of Ownership and Performance on Executive Tenure in U.S. Corporations', *Academy of Management Journal*, vol. 23, pp. 653-644.
- Shleifer, A. & Vishny, RW 1986, 'Large Shareholders and Corporate Control', *The Journal of Political Economy*, vol. 94, no. 3, pp. 461-488
- Singh, M & Davidson, WN 2003, 'Agency cost, ownership structure and corporate governance mechanisms', *Journal of Banking and Finance*, vol. 27, pp. 793-816.
- Smith, C 1977, 'Alternative Methods for Raising Capital: Rights Versus under Written Offerings', *Journal of Financial Economics*, vol. 5, pp. 273-307.
- Yermack, D 1996, 'Higher market valuation of companies a small board of directors', *Journal of Financial Economics*, vol. 40, pp. 185-202.

Appendix (VIF)

Table 9: VIFTest for table 8

Model	1	2	3	4	5	6
Dependent Variable	ROA	ROA	ROA	TobinsQ	TobinsQ	TobinsQ
CONCENTRATION	1.345			1.345		
INSIDER		1.309			1.309	
MANAGER			1.036			1.036
BOARD			1.340			1.340
CONTROLLING		1.187	1.191		1.187	1.191
INSTITUTE	1.558	1.558	1.579	1.558	1.558	1.579
PLEDGING	1.061	1.065	1.070	1.061	1.065	1.070
BOARDMANAGER	1.053	1.053	1.060	1.053	1.053	1.060
PYRAMIDS	1.387	1.419	1.431	1.387	1.419	1.431
CROSSdum	1.228	1.249	1.250	1.228	1.249	1.250
CASH	5.108	5.112	5.120	5.108	5.112	5.120
EXCASH	5.048	5.054	5.077	5.048	5.054	5.077

Table 9: VIF Test for table 8 (continued)

Model	7	8	9	10	11	12
	(EXCASHdum=1)					
Dependent Variable	ROA	ROA	ROA	TobinsQ	TobinsQ	TobinsQ
CONCENTRATION	1.349			1.349		
INSIDER		1.312			1.312	
MANAGER			1.037			1.037
BOARD			1.345			1.345
CONTROLLING		1.188	1.193		1.188	1.193
INSTITUTE	1.568	1.568	1.591	1.568	1.568	1.591
PLEDGING	1.063	1.067	1.072	1.063	1.067	1.072
BOARDMANAGER	1.054	1.054	1.061	1.054	1.054	1.061
PYRAMIDS	1.389	1.421	1.433	1.389	1.421	1.433
CROSSdum	1.229	1.250	1.251	1.229	1.250	1.251
CASH	5.392	5.397	5.401	5.392	5.397	5.401
EXCASH	6.418	6.426	6.436	6.418	6.426	6.436
EXCASHdum	1.566	1.566	1.569	1.566	1.566	1.569