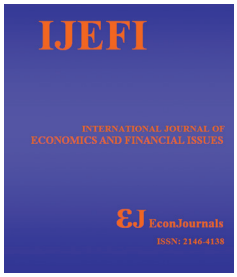

International Journal of Economics and Financial Issues

ISSN: 2146-4138

available at http: www.econjournals.com

International Journal of Economics and Financial Issues, 2017, 7(5), 517-529.

The Impact of Governance Mechanism and Managerial Overconfidence on the Value of Cash Holdings

Shen-Ho Chang[1], Feng-Yi Hsu[2]*

[1]Department of Accounting, Feng Chia University, No. 100, Wenhwa Rd., Seatwen, Taichung, Taiwan 40724, R.O.C., [2]Feng Chia University, No. 367, Beining Rd., Zhongzheng Dist., Keelung City 202, Taiwan, R.O.C. *E-mail: fengyi@mail.nmmst.gov.tw

ABSTRACT

This study aims to discuss the overconfident managers and the governance mechanism of the company on the value of cash held by enterprises. According to the empirical findings, the overconfident managers greatly reduces the value of the cash held by the enterprises, while the governance mechanism of the company can effectively weaken the overconfidence of the manager, and thus, significantly increase the value of the cash. An efficient governance mechanism of a company can increase the value of held cash to the level that the cash value is 2.67 times more than the cash held under an inefficient governance mechanism. Therefore, managers with overconfidence should be encouraged to hold more cash in an efficient governance mechanism.

Keywords: Overconfidence, Cash Holdings, Governance Mechanism
JET Classification: G3

1. INTRODUCTION

Cash is the most liquidity asset on the balance sheet, as well as the accounting item easiest for the public to understand in a financial statement. Usually, average investors will take the information about companies as the reference for investment, and cash is the simplest information to analyze the characteristics of companies. Nevertheless, cash is an asset featuring high currency and low return, and the amount of cash held by a company depends on the company's operational development and investment policies. Regarding investors, the cash held by a company can be regarded as an essential index to review its system and risk.

According to Keynes (1936), enterprises will hold cash out of transaction and preventative motivations. The so-called transaction motivation indicates that an enterprise holds cash for daily operations and business transactions; while preventative motivation means that it holds cash to respond to emergencies. Nevertheless, cash is an asset with low return. While holding too much cash would result in the selfish behaviors of managers, and idle cash indicates fewer investment opportunities, inadequate funds for emergencies would cause difficult financial turnovers and bankruptcy. According to previous studies, enterprises would adjust the amount of the cash they held according to their operations and economic circumstances. Enterprises that have more growth opportunities, smaller enterprises, and enterprises that engage in risky activities, usually hold more cash than others; in comparison with the enterprises with less cash, those with more cash are usually more active to become involved in merger and acquisition (Opler et al., 1999; Harford, 1999), Riddick and Whited, 2009; Boubakri et al., 2013). Nevertheless, cash is an asset with low return, and cash holding has some costs. To maintain an appropriate amount of cash, enterprises must maintain the balance between transaction costs and the opportunity cost of cash holding.

Cash is the current asset which is the most understandable to investors in a financial statement, and whether the holding value of cash is higher than the intrinsic value of cash can reflect the operational performance of an enterprise. Therefore, in recent years, some scholars have extended their attention from cash holdings to the value of cash holding or to the effects of cash holdings on corporate value.

In their empirical study, Pinkowitz and Williamson (2004) pointed out that the value of cash holding of USD 1 was about USD 1.2, and that the value of cash holding would increase if an enterprise had good growth opportunities. Mikkelson and Partch (2003) analyzed the effects of the cash reserve policies of corporate performance; according to their study, companies with large amounts of cash used a large portion of such cash to meet their cash demands for growth investment, and the performance of these companies was better than that of other companies of the same industrial scale. Faulkender and Wang (2006) believed that the marginal value of the cash of companies with large amounts of cash holdings, high leverage, and easier access to the capital market, would decline with increased cash holdings. Couderc (2005) studied the listed companies in Canada, France, Germany, the UK, and the United States during the period from 1989 to 2002, and found that excessive cash holdings would lead to poorer operational performance. According to the above academic papers, studies of enterprise characteristics, managers, and comments by shareholders, were inconsistent with their conclusions regarding the value or performance of cash holding.

Observations from different angles have resulted in different conclusions regarding the value and performance of a company's cash holdings, as the capital market is not a complete market and has problems of agency and asymmetric information. According to the trade-off theory of cash holdings, enterprises would strike a balance between the benefits and costs of cash holdings to maximize the wealth of shareholders. Excessive cash holdings would create opportunity costs, while inadequate cash holding would generate transaction costs. With a balanced relation between these two costs, it would determine the most optimal cash holdings for enterprises. According to the empirical study by Opler et al. (1999) and Harford (1999), there was indeed the most appropriate cash holding for enterprises.

However, according to the Pecking order theory, as proposed by Myers and Majluf (1984), there are no most optimal cash holdings for companies, and they believed that enterprises would give priority to internal funds in financing, followed by loans and equity financing, respectively. In a perfect capital market, the pecking order theory would not exist, as cash holdings would not have any effects on corporate value regardless of whether enterprises raise funds through loans, equity, or internal funds. However, in reality, there is no perfect capital market, and the problem of agency between shareholders, managers, and information asymmetry would influence enterprise policies regarding cash holdings.

Cash holding is closely related to the development, operation, and investment policies of enterprises; however, policies regarding cash holding are one of discretionary powers of corporate management. According to Jensen and Meckling (1976), shareholders and managers had different objectives due to information asymmetry and ethic risks in the agency relationship, which would result in agency problems. To maximize their personal interest, managers would increase perquisites consumption in their occupation, which will lead to the reduction of corporate value. Jensen (1986) argued that if a company had an agency problem and held excessive cash, it would induce managers to make inappropriate investments, which would reduce corporative value. According to Myers and Rajan (1998), current assets would be easily turned into private interests with a lower cost, and more current asset holdings might cause more severe agency problems. Harford (1999) found that, while the managers of enterprises with large amounts of cash holdings were more active to engage in merger and acquisition than enterprises with less cash holdings, they would also cause lower corporate value. Faulkender and Wang (2006) found that cash holding led to costs, and caused problems that managers might pursue personal interest, perquisites consumption, or make inefficient investments; consequently, the market value of USD 1 held by the company would be actually worth USD 0.94.

The above agency problem originated in the reality that there is no perfect capital market, and the incompleteness of the capital market results in the problem that enterprises are influenced by many factors in their financing decisions. The personal traits of managers may distract enterprises from the objective of maximizing the returns for shareholders, and may even affect corporate performance. Against the hypothesis regarding a perfect and effective market in the traditional economic theory, behavioral finance argues that personal cognitive deviations, emotions, and experiences influence decision-making, and the personal traits of managers have high effects on the asset al.ocation of enterprises, meaning the decisions of investment and financing are not the best decisions.

Most recent studies of the personal traits of managers focused on the overconfidence/over-optimism of managers, which would result in over-evaluation of the future operational performances of enterprises, as well as the under-evaluation of potential risks. Most previous studies of the overconfident managers emphasized investment decisions, financing structures, and merger and acquisition, while few elucidated the effects of the managerial overconfidence on the value of the cash holdings of enterprises. Most foreign academic papers on cash holdings also considered the effects on corporate performance and value, while few concentrated on the overconfidence of managers. A rational manager should allocate assets with the objective of maximizing returns for shareholders. Nevertheless, managers' traits, selfishness, inability to face risks, or inappropriate investments would reduce corporate value. Whether the overconfidence of managers has negative effects on the value of cash holding or whether different industrial features and corporate characteristics have different results is worthy of further discussion.

From another perspective, if the overconfident managers harm corporate value, whether the governance mechanism of enterprises can effectively eliminate or restrict the overconfidence of managers is an issue to be discussed. According to Alkhafaji (1990), corporate governance mechanism was a form of structure and power, which was designed to regulate the responsibility and power among different groups in an organization. For an enterprise, it refers to the operation methods and duties of all managers and directors. From a financial angle, the governance mechanism is intended to alleviate the agency problem between managers and shareholders. According to previous studies, the value of the cash holdings of enterprises with efficient governance mechanism was higher than

that of those with inefficient governance mechanism. Dittmar and Mahrt-Smith (2007) pointed out that the quality of a governance mechanism had greater effect on the value of cash holdings. In an enterprise with poor governance, the value of a cash holding of USD 1 ranges from USD 0.42 to USD 0.88; in an enterprise with efficient governance, it is twice that of the former. Moreover, shareholders can use an efficient governance mechanism to address the problem of managers' inefficient use of corporate assets. However, interactions between the managerial overconfidence and the governance mechanism, as well as the effects of them on the value of cash holdings, are worthy of exploration.

Cash is the most understandable current asset in a financial statement, as well as the asset most likely to be manipulated by managers. Most domestic academic papers regarding the value of cash holdings of enterprises focused on the governance mechanism or equity structure of the enterprises; however, few studies have been conducted on the effects of the managerial overconfidence on the value of the cash holdings of enterprises. Hence, this study aims to probe into the effects of the managerial overconfidence and the governance mechanism of enterprises on the value of the cash holdings of enterprises. According to the results of this empirical study, the overconfident managers would significantly reduce the value of cash holding. Analysis results show that the value of cash held by overconfident managers is lower than that by managers who are not overconfident. However, an efficient governance mechanism could reduce the impacts of the overconfident managers and tremendously increase the value of cash holding of enterprises. Moreover, the value of cash holding under an efficient governance mechanism is 2.67 times that under an inefficient governance mechanism.

The contribution of this study is that it simultaneously explores the effects of the managerial overconfidence and the governance mechanism of enterprises on the value of the cash holdings of enterprises, and can serve as a supplementary academic paper for studies analyzing the value of the cash holdings of enterprises from different perspectives. Moreover, the empirical results would be helpful for enterprise managers to make policies regarding cash holdings according to industrial conditions and the governance mechanism. In Part II of this study, relevant academic studies are discussed and the hypotheses are proposed; Part III focuses on the methods of exploring the effects of the managerial overconfidence and the governance mechanism of enterprises on the value of cash holdings. Part IV presents the empirical results, and the conclusions of this study are given in the last part.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

In recent years, there are growing studies on the cash holdings of enterprises at home and abroad, which have elaborated on the effects of cash holdings and the governance mechanism of enterprises on the value of cash holding. The purpose of this study is to explore the effects of the managerial overconfidence on the value of cash holding and corporate performance, as well as to determine if the governance mechanism can restrict the overconfidence of managers and its effects on the value of cash holding. In this part, emphasis is placed on relevant academic papers.

2.1. Value of Cash Holding

In comparison with other current assets, cash is the asset that managers would find easiest to manipulate, as well as an asset item that investors would find easiest to understand in the financial statement of an enterprise. The value of cash holdings can be used to compare performances among different enterprises. Tong (2011) compared performances between multi-diversity enterprises and under-diversity enterprises through the value of their cash holdings. According to Dittmar and Mahrt-Smith (2007), the value of cash holding was a good index to compare the performances of management and operations among enterprises.

The amount of cash held by an enterprise is the management strategy of this enterprise, which influences its operational performance. Whether NTD 1 can be used to create a value worth more than NTD 1 depends on the performance brought by the operation and management decisions of managers. To analyze the effects of policies regarding large amounts of cash reserves on corporate performance, Mikkelson and Partch (2003) investigated 89 listed companies in United Stated that had held large amounts of cash for a long period of time. According to the research results, the operational performances of enterprises that held large amounts of cash were greater than those of other enterprises of the same industrial scale, as enterprises with large amounts of cash would use a large portion of their cash to meet their cash demands for growth and investment. However, it has not been proven that the managers of enterprises holding large amounts of cash would neglect the operations of the enterprises. Taking listed companies in United Stated from 1962 to 1997 as the samples, Pinkowitz and Williamson (2004) adopted the regression method by Fama and French (1998) to discuss the market value of the cash held by companies. They found that the average value of the cash holding of USD 1 held by an enterprise was about USD 1.20, and that the value would be higher if the enterprise had good growth opportunities; the value of the cash holding of USD 1 held by an enterprise trapped in a financial distress was lower than USD 1; however, entering the capital market for financing would not affect the value of cash holding. In general, the investing opportunity influences the value of corporate cash held by shareholders, rather than financing.

In a study involving 19 industries in the US from 1950 to 1994, Harford (1999) found that enterprises holding large amounts of cash were more active to acquire other enterprises than those holding less cash; however, such acquisition would reduce corporate value and the wealth of shareholders. Taking listed companies in Canada, France, Germany, the UK, and the US as the samples, Couderc (2005) found that excessive cash holding would result in poor operational performance. Tong (2011) also noticed that the value of the cash holdings (USD 0.92) of a multi-business enterprise was lower than that (USD 1.08) of a singular-business enterprise. Taking listed companies in United Stated from 1972 to 2001 as the samples, Faulkender and Wang (2006) proposed hypotheses according to three corporate cash systems (distributing

cash, servicing debt or other liabilities, and raising cash), and by considering the financial features of the enterprises, they probed into how the marginal value of cash changed with the financial features of the enterprises. According to the research results, the marginal value of cash would decline with increased cash holdings, higher leverage, or less financial restrictions on enterprises.

According to the above literature review, the value of cash holding of enterprises and its effect on corporate performance remain to be defined. Agency, information asymmetry, and restrictions on the financing of enterprises may all have effects on the value of the cash holdings and performances of enterprises. However, in an imperfect capital market, cash is still an important tool for corporate operations; therefore, this study proposes the following hypothesis:

H1: Cash holding of enterprises has positive effects on corporate value.

2.2. Overconfidence of Managers

Many studies have revealed that there is the gap between the human behavior in the capital market and the assumption in the traditional market. As the number of phenomena that cannot be explained by the traditional economic theories in the capital market continue to rise, some scholars have applied the science of psychology to analyze the behaviors of investors to explain such phenomena, which has contributed to the formation of behavioral finance. While traditional financial theories are developed on the basis of rational hypotheses, psychology studies show that humans are not always reasonable, people would show overconfidence and an inability to face loss, and would display representative and conservation behaviors during decision-making under uncertain conditions (Kahneman and Tversky, 1982). In particular, overconfidence is the issue that has attracted the most attention from scholars in recent years.

Roll (1986) was the first to propose the manager's irrationality, and integrated the overconfidence of managers with the merger and acquisition of companies. In addition to proposing the hypothesis regarding the hubris of managers, he analyzed the effects of the managerial overconfidence on the merger and acquisition of enterprises. According to the overconfidence, managers tended to over-estimate the benefits brought by mergers and acquisitions; consequently, low-value mergers and acquisitions caused the reduction of corporate value; and he added that these managers might over-estimate the internal returns of enterprises and believe that external investors under-estimated corporations, which resulted in failed mergers and acquisitions. The overconfident managers mean that managers over-estimate their abilities, as well as the prospective operational performance of enterprises, while under-estimating the operational risks of enterprises. Managers are the core decision-making elements of an enterprise, and thus, are more likely to show overconfident behaviors. Many empirical studies have demonstrated that managers have overconfident behaviors, and that these behaviors affect the strategic choices of enterprises (Busenitz and Barney, 1997; Landier and Thesmar, 2004; Malmendier and Tate, 2005; Lin et al., 2005; Brown and Sarma, 2007; Landier and Thesmar, 2009; Galasso and Simcoe, 2011; Ben-David et al., 2013).

According to the findings of the study by Goel and Thakor (2000; 2008), all managers would choose a highly risky investment plan in a competitive environment, and overconfident managers are more likely to get promoted than more rational managers, as the former tends to under-estimate risks, and thus, has more chances to show their abilities. For shareholders, overconfident managers would be better than rational managers, as the former were more consistent with shareholders' expectations regarding risk distribution, and overconfident or optimistic managers were more likely to get promoted.

According to some studies, the overconfidence of managers may reduce the problems between managers and shareholders, or between managers and creditors, which would then increase corporate value. In his empirical study, Hackbarth (2008) found that overconfident managers could reduce the problems between managers and shareholders in terms of dividend policy, as well as between creditors and shareholders regarding investment policies, and served as a positive value for enterprises. Hackbarth (2009) observed the effects of the overconfidence/over-optimism of managers regarding decisions of financing and investment from the perspective of the science of behavior, and found that the overconfidence of managers had positive effects on corporate value.

According to the study by Brown and Sarma (2007), the overconfident managers would result in excessive diversification of corporate investment; moreover, overconfident managers tended to make more decisions of merger and acquisition than other managers. Doukas and Petmezas (2007) also found that due to the self-attribution bias, overconfident managers tended to attribute the successful implementation of strategies to their abilities, while attributing failure to external factors. According to them, while managers who were more overconfident were more likely to implement merger and acquisition, the returns brought by such merger and acquisition were much fewer than that by non-overconfident managers. According to Malmendier and Tate (2008), the number of merger and acquisition by overconfident managers was greater than that by non-overconfident managers by 65%; if an enterprise had adequate internal funds, overconfidence tended to adopt a low-value merger and acquisition, which would reduce the value created by shareholders.

Malmendier and Tate (2005; 2008) conducted a series of studies on the overconfidence of managers, and found that stronger overconfidence of managers would result in greater sensitivity between the investment and cash flow of enterprises. In other words, if overconfident managers had more cash flow, they would make more investment plans, such as merger and acquisition. However, they might over-estimate the prospective benefits of investment plans and under-estimate risks; consequently, such investment plans not only resulted in no substantial benefits, but also reduced corporate value. According to the empirical study by Doukas and Petmezas (2007), mergers and acquisitions by overconfident managers could create benefits for shareholders in the short-term; however, the benefits were lower than the value that rational managers created for shareholders. In the long-term, the performance of the mergers and acquisitions of overconfident managers was not great.

Most previous studies of the overconfident managers focused on the effects of investment, merger and acquisition, financing, loans, and dividend policy on the value and performance of enterprises. Little studies on the effects of the managerial overconfidence on the cash holding and value of enterprises. Meanwhile, academic papers on cash holding and managers also concentrated on the problem of agency. According to the study by Harford (1999) regarding the free cash flow theory by Jensen (1986), enterprises holding more cash would face a more serious agency problem; the overconfidence of managers might deteriorate the problem. Overconfident managers often over-estimate the prospective cash flow of their enterprises, and believe that their enterprises are under-estimated by the capital market; consequently, these enterprises avoid external financing and become more reliant on internal funds to gain investment opportunities, thus, they hold more cash. According to Stulz (1990), if an enterprise held excessive cash, and its managers failed to make full use of it to increase corporate value, and instead choose to seek personal interest, such cash holding might reduce corporate value. An enterprise's strategies regarding the use of cash, meaning for investment, financing, or dividends, are made by managers, and the decisions by managers are related to their behavioral characteristics. An inappropriate decision would cause the reduction of the value of shareholders and enterprises. Hence, this study believes that overconfident managers have negative impacts on the cash holdings of enterprises, and thus, proposes the following hypothesis:

H2: Overconfident managers have negative effects on the value of cash holding.

2.3. Governance Mechanism of Enterprises

The so-called governance mechanism of enterprises means that a management and monitoring mechanism is established to improve the operation of the company and seek maximum benefits. Alkhafaji (1990) defined governance mechanism as a form of structure and power that regulated the duties and powers among different groups in an organization. For an enterprise, it referred to the way in which an enterprise was operated, as well as the duties of all managers and directors. Shleifer and Vishny (1997) defined the governance mechanism of enterprises as an effective mechanism that could reduce agency problems which caused by managers, which prevents the rights and interests of small shareholders from being reduced through a legal mechanism. It is obvious that the governance mechanism of enterprises is a management and monitoring mechanism that ensures a right direction for the operation of enterprises, and reduces agency problems to protect the rights and interests of all interested parties. According to the studies by Agrawal and Knoeber (1996), Millestein and MacAvoy (1998), Yeh et al. (2001), and Weir et al. (2002), the governance mechanisms of enterprises have positive effects on corporate performance and value. Some scholars, including Harford et al. (2008), Dittmar and Mahrt-Smith (2007), Harford et al. (2008), Kusnadi (2011), and Kuan et al. (2012), extended the concept to a discussion on the value of cash holding.

Taking listed companies in United Stated from 1990 to 2003 as the samples, Dittmar and Mahrt-Smith (2007) investigated the value of cash holding from the perspective of the governance mechanism. According to the results of their empirical study, the average value of cash holding of the sample companies ranged from USD 1.07 to USD 1.09; that of companies with an efficient governance mechanism ranged from USD 1.27 to USD 1.62; that of companies with an inefficient governance mechanism ranged from USD 0.42 to USD 0.88. In other words, the value of the cash holding of companies with an efficient governance mechanism was nearly twice that of companies with an inefficient governance mechanism. According to them, cash featured less monitoring and greater discretion, and the value of cash holding could be used as an index to compare management among different companies.

Taking the American S&P 500 and other large enterprises from 1993 to 2004 as samples, Harford et al. (2008) analyzed the relationship between the governance mechanism and cash holding of enterprises. According to their empirical study, an inefficient governance mechanism would cause the waste of cash holdings, and the rapid decline of cash holdings would drive managers to spend cash on mergers and acquisitions. If the governance mechanism of an enterprise was inefficient, while the enterprise had large amounts of cash, the profitability and value of the enterprise would be lower.

In a study that involved 276 listed companies in Singapore (142) and Malaysia (134) from 2000 to 2005, Kusnadi (2011) probed into the relationship between governance mechanisms and the cash holdings of enterprises. According to the results of their empirical study, enterprises with an inefficient governance mechanism tended to hold more cash than those with an efficient governance mechanism; if the number of agency problems between managers and a few shareholders increased, managers would reserve more cash to consolidate their status and gain greater discretionary power. Moreover, it has been confirmed that, regarding the cash held by enterprises with a singular leadership structure, those with a pyramid-shaped equity structure and family enterprises have negative effects on corporate value. In other words, enterprises with an incomplete governance mechanism would have a lower value of cash holdings.

According to the above literature review, this study proposes the following hypothesis:

H3: The governance mechanism of an enterprise has positive effects on the value of cash holding.

According to the empirical study by Harford (1999), enterprises holding more cash would encounter more serious agency problems. Overconfident managers tend to over-estimate prospective benefits and under-estimate risks, and thus, conduct excessive merger and acquisition, investment, financing, and loaning. Instead of creating high value for enterprises, such behaviors would deteriorate the agency problems between managers and shareholders. As above mentioned, the governance mechanism of enterprises is established to reduce agency problems among the interested parties. According to the empirical studies by Brickley et al. (1988), Bathala et al. (1994) and Seetharaman et al. (2001), there is monitoring by institutional investors in the governance mechanism of enterprises and institutional investors play a highly important role in the

monitoring and management of enterprises, which could reduce the agency problems of enterprises. Therefore, this study proposes the following hypothesis:

H4: The governance mechanism of enterprises reduces the effects of the managerial overconfidence on the value of cash holding.

3. RESEARCH METHOD

This study discusses the effects of the managerial overconfidence on enterprises and the value of cash holding, as well as the effects of the governance mechanism's restrictions on the overconfidence of managers regarding the value of cash holdings of enterprises. In this part, emphasis will be placed on data sources, the establishment of an empirical model, and the definitions of the chosen variables.

3.1. Sample Selection and Data Source

This study chooses the annual data of listed and OTC companies in the Taiwan Economic Journal (TEJ), and focuses on the relationship among the overconfident managers, the governance mechanism of enterprises and the value of cash holding. Regarding to acquisition of the variables of the governance mechanism, the year when the data of the governance mechanism module of the TEJ companies began to be collected is taken as the starting year of this study; therefore, the listed and OTC companies from 2006 to 2015 are taken as the subjects. In consideration of the characteristics of the field, finance, insurance, and securities companies are removed.

3.2. Research Design and Empirical Model Study

This study aims to explore the value of the cash holdings of enterprises from the perspectives of the overconfident managers and the governance mechanisms of the enterprises. Regarding the research method, the model proposed by Faulkender and Wang (2006) is adopted to measure the marginal value brought by the cash holding of enterprises. Moreover, the overconfident managers, the governance mechanism of enterprises and other variables are used to analyze their relationship with the value of cash holdings.

3.2.1. Regression model of cash holding and the return of enterprises

The first step is to analyze the effects of cash holding on the abnormal returns of enterprises: A model is established to demonstrate H1 and review the effect of cash holding on the abnormal returns of enterprises. The model is, as follows:

$$\gamma_{it} - R_{it} = \alpha_{it} + \beta_1 \frac{\Delta C_{it}}{MV_{it-1}} + \beta_2 \frac{\Delta E_{it}}{MV_{it-1}} + \beta_3 \frac{\Delta NA_{it}}{MV_{it-1}} + \beta_4 L_{it} + \beta_5 \frac{\Delta I_{it}}{MV_{it-1}} + \beta_6 \frac{\Delta RD_{it}}{MV_{it-1}} + \beta_7 \frac{\Delta D_{it}}{MV_{it-1}} + \beta_8 \frac{C_{it-1}}{MV_{it-1}} + \varepsilon_{it} \quad (1)$$

γ_{it} - R_{it} is the abnormal return of stocks, which is obtained according to enterprise size and the book-to-market value, as proposed by Fama and French (1993). $\Delta C_{it}/MV_{t-1}$ is the change of cash holding. Following the practice of Tong (2011), this study divides the cash variance of the current period with the market value of equity of the previous period to measure the change of cash holding. The coefficient of regression model can show the effect of the change cash holding on shareholder value; moreover, it can also be interpreted as the marginal value of NTD 1 held by enterprises. MV_{t-1} refers to enterprises' market value of the previous period; ΔE_{it} indicates the surplus before tax and interest; ΔNA_{it} is the change of net asset; L_{it} represents the debt ratio; ΔI_{it} refers to the change of interest charges; ΔRD_{it} indicates the change of research and development charges; ΔD_{it} represents the change of cash dividends; C_{it-1} is the cash holdings of the previous period.

3.2.2. Regression model of the value of cash holding and managers' overconfidence

To explore the overconfidence of managers on the value of the cash holdings of enterprises, this study establishes a model to demonstrate H2. Through the interaction item of the variable of overconfidence and the rate of cash holding, this study analyzes the effects of overconfidence of managers on the value of cash holdings of enterprises. The model is, as follows:

$$\gamma_{it} - R_{it} = \alpha_{it} + \beta_1 \frac{\Delta C_{it}}{MV_{it-1}} + \beta_2 OC_{it} + \beta_3 \frac{\Delta C_{it}}{MV_{it-1}} \times OC_{it} + \beta_4 \frac{\Delta E_{it}}{MV_{it-1}} + \beta_5 \frac{\Delta NA_{it}}{MV_{it-1}} + \beta_6 L_{it} + \beta_7 \frac{\Delta I_{it}}{MV_{it-1}} + \beta_8 \frac{\Delta RD_{it}}{MV_{it-1}} + \beta_9 \frac{\Delta D_{it}}{MV_{it-1}} + \beta_{10} \frac{C_{it-1}}{MV_{it-1}} + \varepsilon_{it} \quad (2)$$

OC refers to the overconfidence of managers. In previous academic papers, the stock holdings of managers (Malmendier and Tate, 2005; Lin et al., 2008), the predicted bias of enterprise surplus (Lin et al., 2005), the comments of mainstream media about the general manager (Malmendier and Tate, 2005; 2008; Brown et al., 2007), the frequency of merger and acquisition by managers (Billett and Qian, 2008; Doukas and Petmezas, 2007), and a large amount of capital expenditures (Ben-David et al., 2013) are taken as the proxy variables of the overconfidence of managers. Since 2002, listed companies in Taiwan have not been forced to release information predictions; however, media comments are too subjective and a database of the mergers and acquisitions of enterprises is unavailable. And more, most managers in Taiwan have not served in the post for a long time, thus, the period of their holding stocks is too short. Previous studies showed that overconfident managers often make excessive investments or capital expenditures; therefore, in consideration of the academic papers of Ben-David et al. (2013), this study regards a proportion of investment in fixed assets, which is higher than the median of the industry as "overconfident". OC is the proxy variable of overconfidence. If capital expenditures are higher than the median, it would be "1"; otherwise, it would be "0".

3.2.3. Regression model of the value of cash holding and the governance mechanism of enterprises

To further explore the effects of the governance mechanism of enterprises on the value of cash holdings, Model 3 is established to demonstrate H3. Regarding the relevance between the governance

mechanism of enterprises and the value of cash holding, the model is adopted to calculate the value of the cash holdings of enterprises, and the variable of the governance mechanism of enterprises is added for regression analysis. Moreover, the interaction item of the variables of governance mechanism and the rate of cash holding is used to test the effects of the governance mechanism on the value of the cash holdings of enterprises. The empirical model is, as follows:

$$\gamma_{it} - R_{it} = \alpha_{it} + \beta_1 \frac{\Delta C_{it}}{MV_{it-1}} + \beta_2 GOV_{it} + \beta_3 \frac{\Delta C_{it}}{MV_{it-1}} \times GOV_{it} + \beta_4 \frac{\Delta E_{it}}{MV_{it-1}} + \beta_5 \frac{\Delta NA_{it}}{MV_{it-1}} + \beta_6 L_{it} + \beta_7 \frac{\Delta I_{it}}{MV_{it-1}} + \beta_8 \frac{\Delta RD_{it}}{MV_{it-1}} + \beta_9 \frac{\Delta D_{it}}{MV_{it-1}} + \beta_{10} \frac{C_{it-1}}{MV_{it-1}} + \varepsilon_{it} \quad (3)$$

GOV is the variable of governance mechanism of enterprises. In previous studies, the variable was divided into an internal governance mechanism and an external governance mechanism. This study adopts the governance mechanism of enterprises and the model of the value of cash holdings, as proposed by Dittmar and Mahrt-Smith (2007). In consideration of the possible effects of excessive variables on the results of regression analysis, this study divides the governance mechanisms of enterprises into an internal governance mechanism and an external governance mechanism; the internal mechanism includes CEO duality, the stock holding ratio of managers, the pledge ratio of directors and supervisors, and board size; the external mechanism includes proxy variables, such as the ratio of independent directors and the stock holding ratio of the institutional legal person.

There have been a large number of international and domestic academic studies on the assessment indices of the governance mechanisms of enterprises. To prevent the excessive variables of the governance mechanism from affecting the regression results, this study considers the studies by Chen et al. (2007) and Chan (2014), and used other variables, such as CEO duality, the board size, the stock holding of the legal person, the stock holding of managers, the pledges of directors and supervisors, and the ratio of independent directors to calculate the overall index of the effectiveness of the entire governance mechanism. First, the score of each proxy variable of the governance mechanism ranges from "0" to "4". Then, the scores of all the proxy variables are aggregated to obtain the index of overall governance. A higher overall index score would indicate a more efficient governance mechanism. The overall index scores are shown in Table 1, and the descriptions of the indices are, as follows:

A. CEO duality (CD): If a small enterprise adopted a concurrent post system or a large enterprise used a non-concurrent post system, CD=1; otherwise, CD=0. The size of an enterprise was defined by the study by Palmon and Wald (2002). If the size of an enterprise (market value) was higher than the average market value of all sample enterprises, the enterprise would be regarded as a large enterprise; otherwise, it would be seen as a small enterprise.
B. Stock holdings of managers (MD): The stock holding of managers is divided into four equal portions. The managers whose stock holding proportions are among the first 25% of the sample enterprises would receive 4 points, while those whose stock holding proportion is among the last 25% the sample enterprises would receive 1 point.
C. Pledge ratios of directors and supervisors (DP): The equity pledge ratios of directors and supervisors are divided into four equal portions. Those whose pledge rate is among the first 25% of the sample enterprises would receive 1 point, while those whose pledge rate is among the last 25% of the sample enterprises would receive 4 points.
D. Size of the board of directors (BO): The study by Chen et al. (2007) is adopted to define the number of members for an appropriate size of the board of directors -- the interval between the designated minimum number (5 persons) and one standard error of its mean. If the variable value of the size of the board of directors is above the interval, BO=1; otherwise, BO=1.
E. The ratio of independent directors (IP): If the seat order ratio of independent directors is higher than that of the enterprises of the sample mean, IP=1; otherwise, IP=0.
F. Stock holding ratio of the institutional legal person (BH): The stock holding ratio of the legal person is divided into four equal portions. Those whose stock holding ratio is among the first 25% of the sample enterprises would receive 4 points, while those whose stock holding ratio is among the last 25% of the sample enterprises would receive 1 point.

Table 1: Governance mechanism overall index

Index scores	CD	MD	DP	BO	IP	BH	Total
Best	1	4	4	1	1	4	15
Good		3	3			3	8
Median		2	2			2	7
Weak	0	1	1	0	0	1	3

Overall index GOV=CD+MD+DP+IP+BH+BO

3.2.4. Regression model of the value of cash holding and the overconfident managers and the governance mechanism of enterprises

To determine if the governance mechanism of enterprises weakens the overconfidence of managers to increase the value of the cash holdings of enterprises, this study establishes Model 4 to demonstrate H4. With the interaction of the overconfidence of manager and the ratio of cash holding; and interaction of the overconfidence of manager and the governance mechanism, and the ratio of cash holding, this study analyzes the coefficients to explore the effects of the governance mechanism of enterprises regarding the overconfidence of managers and the value of cash holdings. The empirical model is as follows:

$$\gamma_{it} - R_{it} = \alpha_{it} + \beta_1 \frac{\Delta C_{it}}{MV_{it-1}} + \beta_2 \frac{\Delta C_{it}}{MV_{it-1}} \times OC_{it} + \beta_3 \frac{\Delta C_{it}}{MV_{it-1}} \times OC_{it} \times GOV_{it} + \beta_4 \frac{\Delta E_{it}}{MV_{it-1}} + \beta_5 \frac{\Delta NA_{it}}{MV_{it-1}} + \beta_6 L_{it} + \beta_7 \frac{\Delta I_{it}}{MV_{it-1}} + \beta_8 \frac{\Delta RD_{it}}{MV_{it-1}} + \beta_9 \frac{\Delta D_{it}}{MV_{it-1}} + \beta_{10} \frac{C_{it-1}}{MV_{it-1}} + \varepsilon_{it} \quad (4)$$

4. EMPIRICAL RESULTS AND ANALYSIS

According to the empirical analysis in the previous part, this part gives priority to narrative statistical descriptions of the samples, and then adopts the regression model for analysis, in order to probe into the effects of the managerial overconfidence and the governance mechanism of enterprises on the value of the cash holdings of enterprises. Moreover, the samples are divided into overconfident samples and non-overconfident samples, as well as those with an efficient governance mechanism and those with an inefficient governance mechanism. Moreover, the industries of the samples are classified into the electronics industries and non-electronic industries, in order to identify any differences in the value of the cash holdings of enterprises under different contexts.

4.1. Basic Narrative and Statistical Analysis

This study takes the listed and OTC companies in Taiwan as the samples, and the data regarding the listed and OTC companies in TEJ from 2006 and 2015 are chosen. Meanwhile, the companies of finance, insurance, and securities are removed. The original number of data was 13,388; however, 11,734 are kept after those with incomplete information are removed.

According to the descriptive statistics of the variables in Table 2, the maximum of abnormal returns (γ_{it} - R_{it}) is 10.2348, and the minimum is −0.9415; the mean is −0.0281; the median is −0.1116, which shows that a larger number of companies have negative abnormal returns. The maximum of the change of cash holding ($\Delta C_t/MV$) is 8.2678, and the minimum is −2.7705; the mean is 0.0197; the median is 0.0089, which indicates that most of the companies tended to increase their cash holdings. The maximum of the variable of the governance mechanism (*GOV*) is 15, and the minimum is 2; the mean is 10.09; the median is 10; the standard deviation is 2.0070, which reveals that there are great differences in governance mechanisms among different companies. There are great differences in the change of net asset ($\Delta NA/MV$); while there are insignificant differences in the change of earnings before tax and interest ($\Delta E/MV$), the change of interest expense ($\Delta I/MV$), the change of research and development charges ($\Delta RD/MV$), the change of cash dividend ($\Delta D/MV$), the cash holding of the previous period (C_{t-1}/MV), and the debt ratio (L/MV).

To test the differences in variables between overconfident and non-overconfident samples, this study applies mean t testing and nonparametric Mann-Whitney U testing to test the differences in the variables. The test results are shown in Table 3. While there is a significant difference in abnormal return, as shown in Table 3, there is an insignificant difference in the change of cash holding. In terms of the governance mechanism of enterprises, there is also a significant difference between the two. Among the controlled variables, there is a significant difference in the change of earnings before tax and interest ($\Delta E/MV$), the change of net asset ($\Delta NA/MV$), the change of interest charges ($\Delta I/MV$), the change of research and development charges ($\Delta RD/MV$), the cash holding of the previous period (C_{t-1}/MV), and debt ratio (L), with the exception of the change of cash dividend ($\Delta D/MV$).

Before regression analysis, a test should be conducted to determine if there is linearity among the independent variables. According to the matrix of correlation coefficients in Table 4, there is a weak correlation among the variables, with the exception of the correlation value of the change of cash dividend ($\Delta D/MV$) and the change of earnings before tax and interest ($\Delta E/MV$), which is 0.302, the correlation value of other variables range from −0.092 to 0.2, indicating weak correlation. Hence, the effect of linearity among the independent variables is insignificant, and regression analysis could be conducted.

4.2. Analysis of Empirical Results

This section conducts empirical analysis of the abovementioned hypotheses. Panel regression analysis is adopted to explore the relationship among overconfidence, the governance mechanism, and the value of cash holding. To facilitate a review of the relationship among overconfidence, governance mechanism, and industry type (electronic/non-electronic), the samples are grouped for regression analysis to determine the effects of the overconfidence of managers, the governance mechanism, and industry type on the value of cash holdings.

4.2.1. Empirical results of research hypotheses

This study aims to discuss the effects of cash holding on corporate returns, the effects of overconfidence and the governance mechanism on the value of cash holding, and the effects of the governance mechanism on the overconfidence of managers. For

Table 2: Descriptive statistics (Whole samples)

Variable	Minimum	Maximum	Mean	Median	Standard deviation	Variance
γi_t - R_{it}	−0.9415	10.2348	−0.0281	−0.1116	0.4950	0.2450
$\Delta C_t/MV$	−2.7705	8.2678	0.0197	0.0089	0.1755	0.0310
OCt	0.0000	1.0000	0.5000	1.0000	0.5000	0.2500
GOV	2.0000	15.0000	10.0900	10.0000	2.0070	4.0300
$\Delta E/MV$	−1.7794	6.4810	0.0223	0.0036	0.2175	0.0470
$\Delta NA/MV$	−199.1787	32.9910	0.0262	0.0248	2.0565	4.2290
$\Delta RD/MV$	−0.7850	0.2501	0.0000	0.0000	0.0173	0.0000
$\Delta I/MV$	−0.7965	0.3568	−0.0012	0.0000	0.0174	0.0000
$\Delta D/MV$	−0.2317	0.4854	0.0048	0.0000	0.0332	0.0010
C_{t-1}/MV	0.0011	8.8403	0.2502	0.1789	0.3008	0.0900
L	0.0058	0.9805	0.4119	0.4133	0.1776	0.0320
N	11734					

(γ_{it} - R_{it}) is the abnormal return of stocks; ΔC_{it} is the change of cash holding; MV_{t-1} refers to enterprises' market value of the previous period; OC refers to the overconfidence of managers; *GOV* is the variable of governance mechanism of enterprises; ΔE_{it} indicates the change of earnings before tax and interest; ΔNA_{it} is the change of net asset; L_{it} represents the debt ratio; ΔI_{it} refers to the change of interest charges; ΔRD_{it} indicates the change of research and development charges; ΔD_{it} represents the change of cash dividends; C_{it-1} is the cash holdings of the previous period

the first step, all samples considered during the research period are used for regression analysis, and the results are shown in Table 5.

According to the analytic results of Model 1 in Table 5, the coefficient of the change of cash holdings ($\Delta C_t/MV$) is 0.173, which is significant at the 1% level, and shows that an increase in cash holdings could significantly increase the abnormal returns of enterprises. This finding is consistent with the conclusions of Baskin (1987), Kim et al. (1998) and Opler et al. (1999); therefore, hypothesis 1 set up.

According to the analytic results of Model 2, the coefficient of overconfidence is 0.042, which is significant at the 1% level, this manifests that the overconfidence of managers, in fact, has significant positive effects on the returns of enterprises. However, the coefficient of the interaction item ($\Delta C_t/MV*OC$) of the overconfident managers and cash holding is −0.172, which is significant at the 1% level, this demonstrates that the overconfidence of managers could significantly reduce the value of cash holding; hence, H2 is valid. Nevertheless, this finding is different from the results of Aktas et al. (2015). The possible reason

Table 3: Result for test the differences in variables between overconfident and non-overconfident samples

Variable	Mean		T-test		Mann-Whitney U
	OC	No-OC	Average deviation	t-value	Z test
$\gamma_{it} - R_{it}$	−0.0162	−0.0400	0.0238***	2.607	−4.327***
$\Delta C_t/MV$	0.0219	0.0176	0.0043***	1.341	−0.234***
GOV	10.3300	9.8500	0.4867***	13.228	−13.247***
ΔE/MV	0.0160	0.0287	−0.0127***	−3.154	−0.971***
ΔNA/MV	0.1668	−0.1156	0.2823***	7.453	−37.246***
ΔRD/MV	0.0018	−0.0018	0.0036***	11.483	−16.517***
ΔI/MV	0.0000	−0.0025	0.0025***	7.773	−17.129***
ΔD/MV	0.0047	0.0048	−0.0001***	−0.233	−1.312***
C_{t-1}/MV	0.2359	0.2647	−0.0289***	−5.203	−6.304***
L	0.4209	0.4028	0.0181***	5.535	−6.397***
有效的 N	5892	5842			

*Correspondence to significant at 10%; **significant at 5%; and ***significant at 1%

Table 4: Pearson correlation

Variable	$\gamma_{it} - R_{it}$	$\Delta C_t//MV$	*ΔE/MV*	*ΔNA/MV*	*ΔRD/MV*	*ΔI/MV*	*ΔD/MV*	C_{t-1}/MV	*L*	*OC*	*GOV*
$\gamma_{it} - R_{it}$	1										
$\Delta C_t//MV$	0.113***	1									
ΔE/MV	0.179***	0.164***	1								
ΔNA/MV	0.022***	0.146***	−0.008***	1							
ΔRD/MV	−0.04***	0.025***	−0.162***	0.028***	1						
ΔI/MV	−0.092***	0.021***	−0.281***	0.2***	0.086***	1					
ΔD/MV	0.264***	0.193***	0.302***	0.031***	0.038***	−0.049***	1				
C_{t-1}/MV	0.102***	−0.055***	0.1***	0.005***	−0.063***	−0.139***	0.057***	1			
L	−0.016***	0.022***	0.064***	0.037***	−0.02***	−0.025***	−0.001***	0.136***	1		
OC	0.024***	0.012***	−0.029***	0.069***	0.105***	0.072***	−0.002***	−0.048***	0.051***	1	
GOV	0.037***	0.03***	−0.02***	0.037***	0.048***	0.048***	0.021***	−0.041***	−0.061***	0.121***	1

*Correspondes to significant at 10%; **significant at 5%; and ***significant at 1%

Table 5: Results of logistic regression analysis (whole samples)

Variable	Model 1	Model 2	Model 3	Model 4
(Constant)	−0.045***	−0.068***	−0.135***	−0.049***
$\Delta C_t/MV$	0.173***	0.273***	−0.01***	0.258***
OC_t		0.042***		
$\Delta C_t/MV*OC$		−0.172***		−0.599***
GOV			0.009***	
$\Delta C_t/MV*GOV$			0.019***	
$\Delta C_t/MV*OC*GOV$				0.047***
ΔE/MV	0.176***	0.175***	0.178***	0.176***
ΔNA/MV	0.005***	0.003***	0.005***	0.003***
ΔRD/MV	−0.83***	−0.97***	−0.858***	−0.807***
ΔI/MV	−1.46***	−1.494***	−1.453***	−1.43***
ΔD/MV	3.305***	3.291***	3.281***	3.273***
C_{t-1}/MV	0.134***	0.145***	0.135***	0.143***
L	−0.1***	−0.103***	−0.094***	−0.098***
Observation	11,734	11,734	11,734	11,734
R^2	0.094	0.097	0.096	0.096
Adj-R^2	0.094	0.096	0.095	0.095
F-value	152.890***	125.557***	124.605***	124.598***

*Correspondes to significant at 10%; **significant at 5%; and ***significant at 1%

is that the overconfident managers of listed and OTC companies in Taiwan cannot use cash as efficiently as that in America, and that American enterprises may have a well-developed governance mechanism, which enhances the utilization of cash holdings by managers. To discuss the effects of governance mechanism of enterprises, this study conducts the following analysis.

According to the analytic results of Model 3, the coefficient of the governance mechanism of enterprises (*GOV*) is 0.009, which is significant at the 1% level. This reveals that the governance mechanism of enterprises has significant positive effects on the returns of enterprises. However, the coefficient of the interaction item (ΔC_t**GOV*) of the governance mechanism of enterprises and cash holding is 0.019, which is significant at the 10% level. This shows that the governance mechanism of enterprises has significant effects on the value of cash holding, thus, H3 is valid, and is consistent with the conclusions of previous studies.

According to analytic results of Model 4, the coefficient of the interaction item ($\Delta C_t/MV$**OC*) of the overconfident managers and the change of cash holding is −0.599, which is significant at the 1% level. This indicates that the overconfidence of managers can significantly reduce the value of cash holding. The coefficient of the interaction item ($\Delta C_t/MV$**OC*GOV*) of the governance mechanism of enterprises, the overconfident managers, and the change of cash holding is 0.047, which is significant at the 1% level. This shows that the governance mechanism of enterprises can weaken the overconfidence of managers and increase the value of cash holding.

4.2.2. Grouped regression analysis of the overconfident managers

To determine if the overconfident managers have effects on the value of the cash holdings of enterprises, this study groups the samples into overconfident samples (*OC*) and non-overconfident samples (*No-OC*). According to Table 6, the coefficient of the cash holding of *OC* is −0.279 (which is significant at the 5% level), while that of *No-OC* is 0.416 (which is significant at the 5% level). This demonstrates that increased cash holdings would reduce abnormal returns in enterprises with overconfident managers, while increased cash holdings would enhance abnormal returns in enterprises with non-overconfident managers.

As shown in Table 6, the coefficient of the interaction item ($\Delta C_t/MV$**GOV*) of the cash holdings and governance mechanism of overconfident enterprises is 0.038, which is significant at the 1% level, while that of non-overconfident enterprises is −0.01, which is insignificant. This means that the governance mechanism of overconfident enterprises can significantly weaken the overconfidence of managers and increase the value of cash holding, while the governance mechanism of non-overconfident enterprises cannot significantly increase the value of cash holding.

The method by Faulkender and Wang (2006) is adopted to obtain the value of cash holding: The marginal value of cash holdings of enterprises with overconfident managers is 0.1137, while that with non-overconfident managers is 0.3175. This shows that the value of the cash holding of overconfident managers is lower than that of non-overconfident managers.

Table 6: Results of logistic regression analysis for groups the samples into overconfident samples (*OC*) and non-overconfident samples (*No-OC*)

Variable	OC	P-value	No-OC	P-value
(Constant)	−0.069***	0.063	−0.183***	0
$\Delta C_t/MV$	−0.279***	0.037	0.416***	0.011
GOV	0.008***	0.011	0.007***	0.018
$\Delta C_t/MV$**GOV*	0.038***	0.004	−0.01***	0.547
ΔE/MV	0.316***	0	0.132***	0
ΔNA/MV	0.023***	0.005	0.001***	0.738
ΔRD/MV	1.543***	0.005	−1.714***	0
ΔI/MV	−5.052***	0	−0.788***	0.008
ΔD/MV	3.035***	0	3.14***	0
C_{t-1}/MV	0.068***	0.003	0.198***	0
L	−0.175***	0	−0.028***	0.413
Observation	5,892		5,842	
R^2	0.107		0.105	
Adj-R^2	0.106		0.103	
F-value	70.817***		68.167***	
Marginal value of cash	0.11373		0.31753	

*Correspondence to significant at 10%; **significant at 5%; and ***significant at 1%, the marginal value of cash holdings of enterprises with overconfident managers is calculated as follows: −0.279+(0.038*10.3330)=0.1137, the marginal value of cash holdings of enterprises with non-overconfident managers is calculated as follows: 0.416+(−0.01*9.8463)=0.3175

4.2.3. Regression analysis of the governance mechanism of enterprises

As above mentioned, the overconfident managers have negative impact on the value of cash holding, which is inconsistent with the conclusions of foreign academic papers. To explore the effects of the governance mechanism of enterprises on the value of cash holding, this study divides the enterprises into those with an efficient governance mechanism and those with an inefficient governance mechanism for analysis, and the analysis results are shown in Table 7.

According to Table 7, the coefficient of the change of cash holdings ($\Delta C_t/MV$) of enterprises with an efficient governance mechanism is 0.256, which is significant at the 1% level, while that with an inefficient governance mechanism is 0.096, which is also significantly at the 1% level. This reveals that an efficient governance mechanism can increase the value of cash holding, and the value of the cash holding of an efficient governance mechanism is 2.67 times as that of an inefficient governance mechanism. Regarding the interaction item ($\Delta C_t/MV$**OC*) of overconfidence and the change of cash holding, the coefficient of an efficient governance mechanism is −0.055, which is insignificant, while that of an inefficient governance mechanism is −0.227, which is significant at the 1% level. This manifests that the overconfident managers have insignificant effects on cash holding under an efficient governance mechanism, while the overconfident managers can significantly reduce the value of cash holding under an inefficient governance mechanism. According to the calculation of the value of cash holding, the marginal cash value of an efficient governance mechanism is 0.2563, while that of an inefficient governance mechanism is 0.1331. This finding is consistent with the conclusions of previous studies.

According to the above empirical results, while the overconfident managers have positive effects on abnormal returns, the excessive

Table 7: Results of logistic regression analysis for groups the samples of the governance mechanism

Variable	GOV- efficient		GOV- inefficient	
	Model 1	Model 2	Model 1	Model 2
(Constant)	−0.066***	−0.089***	-0.036***	−0.053***
$\Delta C_t/MV$	0.256***	0.286***	0.096***	0.233***
OC_t		0.044***		0.03***
$\Delta C_t/MV*OC$		−0.055***		−0.227***
$\Delta E/MV$	0.392***	0.394***	0.068***	0.066***
$\Delta NA/MV$	0.025***	0.021***	0.003***	0.001***
$\Delta RD/MV$	−0.184***	−0.301***	−1.451***	−1.555***
$\Delta I/MV$	−3.394***	−3.425***	−0.879***	−0.91***
$\Delta D/MV$	2.744***	2.749***	3.564***	3.514***
C_{t-1}/MV	0.209***	0.217***	0.085***	0.102***
L	−0.082***	−0.087***	−0.128***	−0.131***
Observation	7,349	7,349	4,385	4,385
R^2	0.123	0.125	0.079	0.081
Adj-R^2	0.122	0.124	0.077	0.079
F-value	128.411***	104.546***	46.681***	38.637***
Marginal value of cash		0.2563		0.13312

To measure the efficient of governance mechanism depends on the sum of the index governance, if the overall index GOV is greater than or equal to the median as a more efficient governance mechanism, otherwise the opposite, the marginal value of cash holdings of enterprises with efficient governance mechanism is calculated as follows: 0.286+(0.055*0.54)=0.2563, the marginal value of cash holdings of enterprises with inefficient governance mechanism is calculated as follows: 0.233+(−0.277*0.44)=0.1331

cash held by overconfident managers would have negative impacts on abnormal returns. An efficient governance mechanism can weaken the overconfidence of managers, thus, overconfident managers should be encouraged to hold more cash under an efficient governance mechanism.

4.2.4. Differentiation of industries

The electronics industry in Taiwan is relatively developed; however, the development and operation of the electronics industry are different from that of traditional industries. To explore the relationship among the overconfidence of managers, the governance mechanism of enterprises, and the value of cash holding in the electronic industry, this study divides the samples into electronic samples and non-electronic samples for analysis, and the analysis results are shown in Table 8.

According to Table 8 Panel A, the coefficient of the change in cash holdings ($\Delta C_t/MV$) in the electronic industry is 0.357, which is significant at the 1% level. This indicates that cash holdings have significantly positive effects on the abnormal returns of enterprises in the electronic industry. In other words, more cash holdings would bring more abnormal returns. In contrast, the coefficient of the change of cash holdings in the non-electronic industry is 0.114. This shows that cash holdings in non-electronic industries are not as effective as that in the electronic industry.

The coefficient of the interaction item ($\Delta C_t/MV*OC$) of overconfidence and the change of cash holding in the electronic industry is 0.153, which is significant at the 10% level, while that in the non-electronic industry is −0.254, which is significant at the 1% level. These manifest that the overconfident managers in the electronic industry can increase the value of cash holdings, and thus, significantly enhance the abnormal returns of enterprises. Additionally, the relationship between two coefficients, the interaction ($\Delta C_t/MV*OC$) of overconfidence and the change of cash holding, as well as that ($\Delta C_t/MV*OC*GOV$) of the governance mechanism, overconfidence, and the change of cash holding, are explored to demonstrate the effects of the governance mechanism, overconfidence, and the variance of cash holding, are explored to demonstrate the effects of the governance mechanism. It is found that the coefficients of the electronic industry are −0.061 and 0.023, respectively, which are not significantly; while that of the electronic industry are −0.61 and 0.04, respectively, which are both significantly at the 1% level. This shows that the overconfident managers in the non-electronic industry can be weakened by the governance mechanism of enterprises to increase the value of cash holdings.

According to Table 8 Panel B, the marginal value of cash holding under the effect of overconfidence of managers in the electronic industry is 0.3695, and that under the governance mechanism of enterprises is increased to 0.48747; however, the marginal value of cash holding under the effect of the overconfident managers in the non-electronic industry is 0.154, and that under the governance mechanism of enterprises is increased to 0.3576. According to the above analysis, the benefits of the cash holdings of the electronic industry are different from that of non-electronic industries; the overconfident managers in the electronic industry can increase the value of the cash holdings and abnormal returns of enterprises, which is highly different from that in non-electronic industries.

5. CONCLUSION

Enterprises hold cash for operations, and cash holdings change according to the policies made by the managers of enterprises. However, cash is a low-return asset, and holding excessive cash would bring few benefits, while holding inadequate cash would cause risk. Managers have the greatest effect on cash holdings. In this study, emphasis was placed on the effects of the managerial overconfidence on the value of cash holdings, as well as the role of the governance mechanism of enterprises in increasing the value of cash holdings.

The empirical results are consistent with the expectation of this study. In fact, while the overconfident managers have positive effects on the value and return of enterprises, it would significantly reduce the value of cash holdings. However, the governance mechanism can effectively weaken the overconfidence of managers and significantly increase the value of cash holding. Further analysis showed that the value of cash holding of overconfident managers is lower than that of non-overconfident managers, and the governance mechanism of enterprises with overconfident managers can significantly weaken the overconfidence of the managers, and thus, increase the value of cash holding; in contrast, the governance mechanism of enterprises with non-overconfident managers cannot significantly increase the value of cash holding. It has also been found that an efficient governance mechanism can increase the value of cash holding, meaning the value of an efficient governance mechanism is 2.67 times that of an inefficient governance mechanism.

Table 8: Results of logistic regression analysis for groups the samples into electronics industry samples and non-electronics samples

Panel A: OLS regression						
Variable	**Electronics**			**Non-electronic**		
	Model 1	**Model 2**	**Model 4**	**Model 1**	**Model 2**	**Model 4**
(Constant)	−0.088***	−0.104***	−0.086***	−0.056***	−0.073***	−0.06***
$\Delta C_t/MV$	0.357***	0.293***	0.279***	0.114***	0.281***	0.273***
OC_t		0.035***			0.029***	
$\Delta C_t/MV*OC$		0.153***	−0.061***		−0.254***	−0.61***
$\Delta C_t/MV*OC*GOV$			0.023***			0.04***
$\Delta E/MV$	0.18***	0.181***	0.182***	0.211***	0.208***	0.209***
$\Delta NA/MV$	0.158***	0.151***	0.157***	0.001***	−0.001***	−0.001***
$\Delta RD/MV$	−0.897***	−0.982***	−0.889***	−0.904***	−1.031***	−0.778***
$\Delta I/MV$	−6.719***	−6.595***	−6.7***	0.015***	−0.015***	0.038***
$\Delta D/MV$	3.079***	3.099***	3.084***	2.539***	2.539***	2.519***
C_{t-1}/MV	0.327***	0.335***	0.327***	0.009***	0.026***	0.026***
L	−0.12***	−0.129***	−0.125***	−0.045***	−0.049***	−0.045***
Observation	6,319	6,319	6,319	5,415	5,415	5,415
R^2	0.146	0.148	0.147	0.073	0.077	0.077
Adj-R^2	0.145	0.146	0.145	0.072	0.075	0.076
F-value	135.022***	109.327***	108.529***	53.308***	45.041***	45.379***
Panel B: The marginal value of cash						
OC mean		0.5			0.5	
GOV mean			10.39			9.74
Marginal value of cash		0.3695	0.48747		0.154	0.3576

We definite the electronic industry by TEJ industrial classification. The number of 24,25,26,27,28,29,30,31 was classified in the electronics industry, the rest of the non-electronics industry

The empirical results of this study are significant in the following aspects. First, enterprises must consider the features of managers and the performance of their governance mechanisms when making policies regarding cash holdings, in order to increase their value. Second, the overconfident managers are beneficial for enterprises in some industries and under some conditions. Third, the governance mechanism of enterprises can indeed increase corporate value and effectively reduce the negative impacts of the overconfident managers on the value of cash holding. Finally, the findings of this study can serve as a supplement to studies on the value of cash, the overconfidence of managers and the governance mechanisms of enterprises.

In terms of limitations, this study merely probed into the variance of the value of cash holding with the overconfident managers and the governance mechanism of enterprises, but does not consider the financial conditions of enterprises, such as restrictions on financing and loaning. Therefore, future studies can classify the financial conditions of enterprises to delve deeper into the effects of the managers with overconfidence.

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