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EFFECT OF MANAGERIAL OVERCONFIDENCE AND COMPENSATION ON SHARE REPURCHASE: EMPIRICAL EVIDENCE FROM TAIWANESE FIRMS

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ABSTRACT

This study analyses the effect of managerial overconfidence and compensation on the behaviour of Taiwanese CEOs who execute share repurchase. A panel data of 715 companies listed in Taiwan Stock Exchange Corporation and over-the-counter from 2008 to 2012 are used for the analysis. Results show that the managers who receive short-term performance bonuses and equity incentives tend to repurchase shares, and these bonuses and incentives are increased when the managers overly estimate the prospects of the company. Overconfident managers are also inclined to use additional capital in buying back shares, especially when they are under a profit-sharing scheme and have additional stock option incentives. The research findings are robust and provide strong policy implications, which advise the board of directors to improve their checks and balances, minimise costly managerial decisions, determine the motives of CEOs in implementing share buybacks, and lessen the information asymmetry inside and outside their business organisations. This study also suggests that future research should look into the tendency of Taiwanese managers to select types of financing (i.e., debt, equity, or a mix) or establish business empires through mergers and acquisitions. Other than the private sector, the case of government-owned and -controlled corporations should also be investigated.

Keywords: managerial overconfidence, compensation incentive, share repurchase, Taiwanese firms, publicly-listed and OTC companies

INTRODUCTION

Share repurchase is a major managerial decision considered by the board of directors (BOD) and managers (i.e., CEOs and CFOs) to achieve the firms' financial objectives. The BOD and managers strive to reach a consensus before they execute substantial decisions. The BOD is a firm's primary decision-maker that approves the implementation of share repurchase because of its benefits to

corporate performance. Some companies execute share buybacks as a tax-efficient method to place cash into their shareholders' hands than to pay dividends. The BOD and managers sometimes decide to repurchase when the company stocks are undervalued by the market. Buybacks are accomplished on other occasions as well to reduce the dilution from incentive compensation plans for employees or to protect the companies against unwanted takeovers.

In Taiwan, companies are generally prohibited to execute share buybacks to protect the investors and avoid any possible manipulation such as insider trading. However, when a company's stock price is reduced due to non-economic factors, negatively affecting its operation, a manager borrows funds to substantially create a high degree of financial leverage to consolidate the firm's holdings among its various subsidiaries. In June 2000, the Taiwanese government ratified the Securities Exchange Act Rule 28-2 and began to implement regulations regarding shares since August 2000 to mitigate the risks involved in such undertaking. This circumstance has allowed the Taiwan Stock Exchange Corporation (TSEC)-listed and over-the-counter (OTC)-listed companies to repurchase company shares provided that they consider the following objectives:

1. Aim to attract and retain talented employees and increase their loyalty.
2. Plan to raise fund and promote the operation and development of the companies.
3. Intend to maintain the credit of the companies and shareholders' equity.

Nevertheless, the Taiwanese government ruled that beginning January 2008, the bonuses of employees should be treated as an expense. This ruling has increased the operating cost of companies and affected their decisions to repurchase shares.

Share repurchase is among the important financial strategies adopted by a company. The motivation for repurchasing shares has been widely analysed in previous literature, most of which are based on information asymmetry, free cash flow, and financial leverage theories. The decision to repurchase shares is influenced by the following main intentions: to indicate that the company's prospects are optimistic (Comment & Jarrell, 1991; Ikenberry, Lakonishok, & Vermaelen, 1995; 2000), to reduce agency cost (Jagannathan, Stephens, Weisbach, 2000; Fenn & Liang, 2001), and to adjust the company's financial leverage effect (Dittmar, 2000; Hovakimian, Opier, & Titman, 2001). Some research has examined the alternative dividend or personal income tax (Grullon & Michaely, 2002) to expropriate creditors' assets, avoid mergers and acquisitions (Bagwell, 1991), manage retained earnings (Hribar, Jenkins, & Johnson, 2006; Gong, Louis, & Sun, 2008), and provide managerial incentives (Jolls, 1998; Kahle, 2002).

Fama (1970) mentioned that the efficient market hypothesis (EMH) implies that investors are rational market participants and that stock markets should reflect all relevant information. Various researchers have supposed that agency theory (Jensen & Meckling, 1976) and information asymmetry (Myers & Majluf, 1984) are the main reasons why share prices deviate from their theoretical prices and affect managerial decisions, including the execution of share buybacks.

Marquardt, Tan and Young (2009) and Young and Yang (2011) determined that the compensation of a manager (the agent) is related to the firm's accounting and marketing performance and that some managers carry out share buybacks to increase their income from the stock price increases and to ensure job security. Bens, Nagar, Skinner and Wong (2003) and Young and Yang (2011) have proven that the managers who possess additional insider information (i.e., asymmetric information) take advantage by announcing share buybacks when the company has satisfactory future prospects and when the stock price is undervalued. Share repurchase prompts the stock prices to increase and reach their real value, and it improves the performance of the retained earnings of each share.

Managerial overconfidence is also considered a determining factor in carrying out share buybacks. Kahneman and Tversky's (1979) prospect theory initially explained the cognitive bias that emerges in individual decision making. This notion was later expanded by Weinstein (1980) and Alicke (1985) to explain the overconfidence in the capital market that reflects an individual's overestimation of the positive outcome of a venture owing to the overestimation of self-control (Langer, 1975; March & Shapira, 1987) and the frequent belief that one's abilities are a key success factor, ascribing any failure to external factors (Miller & Ross, 1975). Hirshleifer, Low and Teoh (2012) and Deshmukh, Goel and Howe (2013) illustrated that overconfident managers overestimate the returns but underestimate the risks of an investment when they make decisions about financing and investing strategies, dividend policies, and capital expenditures. Shu, Yeh, Chiang and Hung (2013) pointed out that overconfident managers also have biases that their firm's stock prices are undervalued, thereby engendering risks in share buybacks.

The majority of the previous research investigated the relation of managerial compensation and share buyback from the perspective of the Western experience, particularly the US. Hence, the present study focuses on the Asian experience, specifically on the cases of TSEC- and OTC-listed companies. Chen and Lu (2015) observed that Taiwan is a relatively advanced country characterised by weak investor protection and limited civil law jurisdiction on corporate activities. In a financial environment with poor investor protection, the

miscalculations on share repurchase by overconfident managers may hurt the interests of the shareholders and draw the attention of the BOD. The shareholders of companies with overconfident managers need strong corporate governance to supervise share buybacks to protect their interests and limit the drawbacks on the company.

This study provides empirical evidence on the activity of overconfident managers in executing share repurchase programs and on the different approaches how firms can limit their impotent managerial tendencies and instead promote beneficial repurchase programs. These contributions are realised by achieving the following objectives:

1. To determine whether managerial compensations and incentives positively affect shares repurchase.
2. To examine whether managerial overconfidence and optimism positively affect shares repurchase.
3. To determine if the combined variables of overconfident managers who receive specific types of compensation and incentives aggravate their tendency to carry out shares repurchase.

The research findings show that the managers who receive short-term performance bonuses and equity incentives repurchase shares and use high capital in buying back shares. Overconfident managers are also determined to overestimate their prospects toward the company. In this case, the tendency to repurchase shares is high, and the capital used for buybacks is augmented. The managers under profit-sharing and stock options policies also use a high amount of capital in implementing shares buyback. In addition, the company spends additional capital to repurchase shares when their overconfident managers receive payment incentives.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

Managerial Compensation and Shares Buyback

The EMH introduced by Fama (1970) stipulates that stock prices react positively toward good company performance that can be attributed to the managers' successful daily operation of the firm. Thus, improved managerial compensation should be directly related to the good performance of the company, which in turn increases stock prices (Marquardt et al., 2009; Young & Yang, 2011). However, Netter and Mitchell (1989) claimed that managers can access relevant information and determine the related operating conditions and the status of stock price (i.e., whether it is undervalued). Myers and Majluf (1984) discussed that

this information asymmetry between managers and investors can be exploited. Previous studies (Dann, 1981; Comment & Jarrell, 1991; Dittmar, 2000) have shown that when a manager is optimistic about the future of the company and realizes that its stock price is undervalued, he or she announces shares buyback to signal the firm's positive prospects, thereby increasing its stock price.

Fenn and Liang (1997; 2001), Kahle (2002), and Gong et al. (2008) determined that the managers with stock-related compensation take advantage of shares buyback because of self-interest and to improve the retained earnings performance of each share. Marquardt et al. (2009) later clarified that a manager with short-term performance compensation tied with the retained earnings performance per share is highly inclined to execute shares buyback. Young and Yang (2011) supported this viewpoint and added that managers conduct repurchases to increase their short-term gains. Hu and Chuan (2006) posited that managers implement shares buyback to improve the dilution effect of retained earnings as well as the firm's operation performance to gain short-term performance compensation. The discussion in the preceding paragraph leads to the following hypothesis:

> H1: Managers who receive short-term performance compensation or bonuses are highly inclined to implement shares buyback.

Previous studies also showed that the equity incentives and dividends of managers affect their decision to repurchase shares. Gong et al. (2008) showed that managers may highly engage in shares buyback if they hold abundant company stocks. Hu and Chuan (2006) concluded that the managers who receive dividends from company shares are also motivated to realise shares buyback. Jolls (1998) and Fenn and Liang (1997; 2001) identified that the managers who hold a huge amount of employee stock option use additional capital to repurchase shares. Kahle (2002) added that when employees execute a high ratio of stock option and when managers have a high stock option, a high amount of funds is allotted for shares buyback. Chen, Lin and Hsu (2013) specified that managers are highly inclined to repurchase shares when they hold extensive warrants; managers also repurchase shares when they think that the stock price is undervalued to boost the price and increase their wealth. Considering the above analysis, this study posits that:

> H2: Managers with stock incentives are highly inclined to implement shares buyback.

Managerial Overconfidence and Shares Repurchase

Overconfident managers overestimate their own abilities and are overly optimistic and controlling individuals. These cognitive biases affect the important decisions and financial strategies of the company. Doukas and Petmezas (2007), Brown and Sarma (2007), and Malmendier and Tate (2008) pointed out that overconfident managers strongly believe in their excellent decision making ability; thus, they underestimate the risk of acquisition and overestimate the consolidation synergy. In addition, these professionals easily overestimate the returns on investment and misinterpret the investment decisions. Deshmukh et al. (2013) also concluded that overconfident managers reduce the expenses on dividend to maintain the financial slack of the company. Overconfident managers engage in high returns and high risk investment (Gervais, Heaton, & Odean, 2011; Hirshleifer et al., 2012), and they delay the recognition of loss on investment and use less conservative accounting strategies (Ahmed & Duellman, 2013). Wu (2010) also showed that overconfident managers tend to repurchase shares frequently. Andriosopoulos, Andriosopoulos and Hoque (2013) revealed that the degree of information asymmetry and managerial overconfidence positively affect the delivery rate of share repurchase. Shu et al. (2013) specified that overconfident managers tend to subjectively judge company shares as undervalued and thus plan to execute buyback. Given these circumstances, this research believes that:

> H3: Overconfident managers are highly inclined to implement shares buyback.

Overconfident managers affect various operations of the firm, such as acquisition policies, investing strategies, financing strategies, and dividend and accounting policies. These managers can also control how they can increase the compensation they receive. The type of compensation and short-term performance bonuses of overconfident managers affect their decisions to repurchase shares. Thus, this study supposes that:

> H4: The composition of overconfident managers pay incentives positively affects their implementation of shares buyback.
>
> H4a: Short-term performance bonuses of overconfident managers positively affect their implementation of shares buyback.
>
> H4b: Stock incentives of overconfident managers positively affect their implementation of shares buyback.

EMPIRICAL MODEL AND VARIABLE DEFINITIONS

Sample Selection

Data on shares buyback, managerial compensation, shareholdings information for overconfidence measurement, and other control variables were retrieved from the Taiwan Economic Journal database. The TSEC- and OTC-listed companies, with the exception of those that belong to the banking, insurance, and securities sectors, from year 2008 to 2012 were included as the study subject. The companies' CEO was used as the primary proxy for managers with tenure covering the study duration of three years. The tenure of CEO in Taiwan is short and can only hold directorship position for three years compared with their Western counterparts that reach an average of 10 years. After excluding the companies that failed to fulfill the overconfidence requirement because of their insufficient shareholder information, accounting years that do not suit the fiscal calendar year, incomplete variables in the regression model, and sample outliers, the total data sample reached 4,836 firms.

Table 1 shows the total sample distribution of 715 companies that have executed share repurchase. The frequency of buybacks was high from 2008 to 2011. This circumstance may be attributed to the global financial crisis in 2008; the global economic growth significantly slowed down in 2011. These economic downturns have motivated various companies to repurchase shares frequently to maintain their stockholder's equity. The frequency of buybacks of the electronic industry was significantly higher than that of the non-electronic industry, accounting for approximately 71% of the total shares buyback samples.

Table 1
Summary of variable definitions

Variables code	Variables name	Operation definition	Expected relation
EXE	Execution of shares repurchase	Companies executing buybacks are given 1, otherwise 0.	−
REP	Capital used for shares repurchase	Capital used for shares repurchase, units in millions of New Taiwan Dollars (NTD).	−
CI_{SPC}	Short-term performance compensation	Managers receiving cash bonus is 1, otherwise 0.	+
CI_{EIC}	Equity incentives	Managers receiving stock dividends or stock options are given 1, otherwise 0.	+

(*continued on next page*)

Table 1: (*continued*)

Variables code	Variables name	Operation definition	Expected relation
CI_{PSSO}	Profit-sharing	Managers receiving cash bonus and stock dividends, units in millions of NTD.	+
CI_{EOP}	Employee stock option	Total amount of employee stock options, units in millions of NTD.	+
MOC	Managerial overconfidence	Managers' tendency to be overconfident is 1, otherwise 0.	+
SIZE	Company size	Natural logarithm of total assets.	−
RETURN	Rate of stock return	[closing price * (1 + ex-rights call rate + ex-rights stock grants rate) + cash dividend] /(closing price + ex-rights call rate * ex-rights call price) − 1.	−
FCASH	Cash holdings	(cash and equivalent cash + short-term investment) / total assets, accurate to 3 decimal places.	+
FCF	Free cash flow	(net income before tax, interest, depreciation and amortization less income tax expenses, interest, depreciation and amortization charges, preferred shares cash dividends, common stock and cash dividends) / total assets.	+
LEV	Debt ratio	Total debt / total assets, up to 3 decimal places.	−
PAYOUT	Dividend payout rate	Cash dividend / net earnings.	−
PLEDGE	Ratio of directors' pledge	Directors' pledge share / total share hold by directors.	+
IDV	Industry categories	Electronic industry is 1, otherwise 0	+

Research Design and Methodologies

The research design was based on the study of Young and Yang (2011) with the use of logistic and Tobit models. This study utilised the logistic regression analysis model to evaluate the probability of shares repurchase and examine the effect of managerial incentives and overconfidence on the execution and amount of shares repurchase. The expanded representation of the logistic model is as follows:

$$EXE_{it} = \ln\left(\frac{P_{it}}{1-P_{it}}\right) = \gamma_0 + \gamma_1 CI_{ijt-1} + \gamma_2 MOC_{it-1} + \gamma_3 CI_{ijt-1} MOC_{it-1} + \sum_{K=1}^{K} \delta_K Control_{Kit-1} + \varepsilon_{it-1} \quad (1)$$

where,

the dependent variable EXE_{it} refers to the execution of shares repurchase. If a particular company (i) conducts shares repurchase at the end of the year, then EXE_{it} is equal to 1; otherwise, 0. P_{it} represents the incidence rate of shares repurchase execution, and ($1\text{-}P_{it}$) denotes the absence of shares repurchase trading and the odds ratio.

The Tobit left censoring regression model was then adopted to evaluate the value of shares repurchase and verify the stated hypotheses. The expanded representation of the Tobit model is discussed below:

$$REP_{it} = \lambda_0 + \lambda_1 CI_{ijt-1} + \lambda_2 MOC_{it-1} + \lambda_3 CI_{ijt-1} MOC_{it-1} + \sum_{K=1}^{K} \theta_K Control_{Kit-1} + \varepsilon_{it-1} \quad (2)$$

where,

the dependent variable REP_{it} represents the amount of capital used for shares repurchase. A coefficient greater than 0 implies that a huge amount of capital was used for shares repurchase trading at the end of the year t; otherwise, it is equal to or less than 0.

The main dependent variable $CI_{ijt\text{-}1}$ is the managerial compensation from company I during the previous years, j represents the managerial compensation and incentives, and $MOC_{it\text{-}1}$ denotes the managerial overconfidence; it is equal to 1 if the manager of company I has a tendency to be overconfident; otherwise, it is 0. $CI_{ijt\text{-}1}MOC_{it\text{-}1}$ is the interacting variables between $CI_{ijt\text{-}1}$ and $MOC_{it\text{-}1}$, and $CONTROL_{Kit\text{-}1}$ is the estimated K factor that affects the manager of company I when conducting shares repurchase.

Variable Measurement

Execution of shares repurchase (EXE): The firms that have executed shares repurchase were determined; this variable is 1 if shares repurchase is executed; otherwise, it is 0.

Capital used for shares repurchase (REP): The real capital used by companies for shares repurchase was measured to determine the trading value of shares repurchase using the measurement method proposed by Dittmar (2000).

Managerial compensation and incentives (CI): Managers were defined as professionals with authority and who oversee the daily operations of firms. These individuals have the right to sign on behalf of the company.

The managerial compensation and incentives *j* received from company *I* include the following:

1. Short-term performance compensation (SPC), which represents the cash bonuses received by managers at the end of year *t*–1; it is 1; otherwise, 0;
2. Equity incentives compensation (EIC), which denotes the stock dividends or employee stock options received by managers at the end of year *t*–1; it is given a value of 1; otherwise, 0;
3. Profit-sharing (PSSO), which refers to the total amount of cash bonuses and stock dividends received by managers at the end of year *t*–1; it is given a value of 1; otherwise, 0.

Employee option program (EOP) is the total amount of shares held by managers from company *I* at the end of year *t*–1.

Managerial overconfidence (MOC): Overconfident managers were interpreted as those who strongly believe in their self-determination, have excessive optimism such that they overvalue their abilities to affect the company's decision, and are inclined to overestimate the returns on investment while underestimating their risk. This variable was gauged using the method introduced by Malmendier and Tate (2008) and Lin, Hu and Chen (2008).

The managers who have held their positions for at least three years were included in the research sample. MOC was measured by determining an increase in the CEOs' stock options or shareholdings for at least two years during their tenure. Such an increase entails that the CEOs strongly believe that the company will improve its performance in the future. Thus, overconfidence was determined; it is either equal to 1 or 0.

Company size (SIZE): The assets of the companies were measured by taking the natural logarithm of their total assets. This variable was utilised as a proxy variable for information asymmetry. This study considered the explanation of Vermaelen (1981) that small companies do not attract the attention of analysts; thus, information asymmetry worsens. This viewpoint was supported by the study of Ikenberry et al. (1995).

Stock return (RETURN): The undervalued stock prices of the companies were determined based on the low rate of returns, conforming to the approach utilised by Dittmar (2000).

The information signaling hypothesis states that stock prices undervalued by the market significantly influence managers to announce share repurchase.

This premise was supported by Vermaelen (1981), Ikenberry et al. (1995; 2000), and Jagannathan et al. (2000).

Cash holdings (FCASH): The cash holdings of the companies were also identified. A company with high cash holdings implies that it is efficiently run by its managers.

The managers of companies with high cash flow and without investment opportunities are highly inclined to repurchase shares (Jensen, 1986; Jagannathan et al., 2000; Fenn & Liang, 2001). This variable was determined by the study using the method adopted by Dittmar (2000) in which the total amount of cash and cash equivalent short-term investment was used as a proxy variable for the available cash.

Free Cash Flow (FCF): The free cash flow holdings of the companies were measured by applying the procedure used by Dittmar (2000). This particular method uses the net income before tax, interest, depreciation, and amortization, with deductions from income tax expenses, interest, depreciation and amortization charges, preferred shares cash dividends, and common stock and cash dividends, which are divided by total assets to obtain the free cash flow.

Debt ratio (LEV): The debt ratio of the companies was determined by dividing the total debt with the total assets.

The financial leverage hypothesis states that managers repurchase shares through free cash flow or debt to adjust the financial leverage ratio to the optimal value (Bagwell & Shoven, 1988; Hovakimian et al., 2001). Dittmar (2000) showed that when the financial leverage ratio is small, shares have a high probability to be repurchased.

Dividend payout rate (PAYOUT): The dividend payout rate was determined by dividing the cash dividend with the net income.

When a company has additional amount of free cash flow, it distributes the capital to its shareholders through cash dividends or share repurchase to reduce the agency cost (Jensen, 1986; Jagannathan et al., 2000; Grullon & Michaely, 2002). Dittmar (2000) specified that when a company provides additional amount of cash dividends, it is less inclined to engage in shares buyback or uses a low amount of fund for such repurchase.

Ratio of directors' pledge (PLEDGE): This variable was measured by dividing the directors' pledge share with the total share held by directors.

Zhen et al. (2006) determined that the self-interest of the insider of the company affects the economic incentive of announcing share repurchase. If the ratio of the directors' pledged share is high, then the shares may highly be repurchased.

Industry categories (IDV): The electronic companies among the samples were determined, and this variable was given the value of 1 as a dummy variable; otherwise, 0. The electronic industry varies from other categories because of its capital intensive and competitive nature. This study included electronic components, semiconductor, computer and accessories, other electronic industries, IT, opto-electronics, electronic communication, and information service into the category of electronic industry. The rest was categorised as non-electronic industry.

Table 2 summarises the variables used in the study, including their expected relationship with shares buyback.

Table 2
Industry- and yearly-based: Frequency of implementing share repurchase

Industry type/ Year	2008		2009		2010		2011		2012		Total	
	F	P	F	P	F	P	F	P	F	P	F	P
Electronic industry												
Electronic component	66	19	15	19	6	15	24	15	13	15	124	17
Semiconductor	37	11	11	14	5	12	31	19	11	13	95	13
Computer and accessories	48	14	6	8	7	17	18	11	10	12	89	12
Others	21	6	2	3	2	5	10	6	5	6	40	6
Information technology	24	7	4	5	5	12	15	9	8	9	56	8
Opto-electronics	26	8	3	4	2	5	20	12	10	12	61	9
Electronic communication	14	4	4	5	2	5	3	2	2	2	25	3
Information service	10	3	3	4	1	2	2	1	1	1	17	2
Others	21	6	2	3	2	5	10	6	5	6	40	6
Subtotal	246	71	48	61	30	73	123	75	60	71	507	71

(*continued on next page*)

Table 2: (*continued*)

Industry type/ Year	2008		2009		2010		2011		2012		Total	
	F	P	F	P	F	P	F	P	F	P	F	P
Non-electronic industry												
Cement	3	1	1	1	0	0	0	0	0	0	4	1
Food	2	1	1	1	0	0	0	0	1	1	4	1
Plastics	4	1	0	0	0	0	1	1	0	0	5	1
Textile fiber	13	4	9	11	1	2	6	4	3	4	32	4
Architectural	9	3	1	1	1	2	4	2	2	2	17	2
Electrical and Mechanical	11	3	3	4	2	5	5	3	2	2	23	3
Biomedical	3	1	2	3	1	2	6	4	2	2	14	2
Electric cable pipe	4	1	0	0	1	2	1	1	0	0	6	1
Chemical	7	2	4	5	1	2	3	2	1	1	16	2
Glass ceramics	1	0	0	0	0	0	1	1	0	0	2	0
Paper manufacturing	2	1	2	3	0	0	1	1	1	1	6	1
Steel	8	2	0	0	0	0	2	1	3	4	13	2
Rubber	3	1	0	0	1	2	1	1	1	1	6	1
Automobile	1	0	0	0	0	0	0	0	0	0	1	0
Shipping service	2	1	3	4	1	2	1	1	1	1	8	1
Energy	1	0	0	0	0	0	1	1	0	0	2	0
Tourism	1	0	0	0	0	0	0	0	0	0	1	0
Merchandising	6	2	1	1	1	2	3	2	1	1	12	2
Culture	7	2	2	3	0	0	2	1	2	2	13	2
Others	12	3	2	3	1	2	3	2	5	6	23	3
Subtotal	100	29	31	39	11	27	41	25	25	29	208	29
Total	346	100	79	100	41	100	164	100	85	100	715	100

Notes: F = Frequency; P = Proportion (in %)

EMPIRICAL RESULTS AND ANALYSIS

Sample Descriptive Statistics

Table 3 of Panel A shows the descriptive statistics of all data samples. The average coefficient of the shares buyback was 0.018, implying that the average shares repurchase amounted to NTD 0.018 million. However, the coefficients of

the first (Q1), median (Q2), and third (Q3) quantiles were all 0. This finding can be attributed to the small percentage of the sample that executed buyback. Of the 4,836 samples, only 715 initiated shares repurchase. The average coefficient for the dividend shares (CI_{PSSO}) was 11.194, indicating that the managers' shares amounted to NTD 11.194 million. The average employee stock options (CI_{EOP}) was 0.28, suggesting that the average number of equity shares received by employees was nearly NTD 0.28 million.

Table 3 of Panel B illustrates the performance of the sample parameters on shares buyback using T-test and Wilcoxon rank sum. The average coefficient for the shares repurchase (*REP*) was 0.122, which indicates that the companies executed shares buyback amounting to NTD0.122 million.The implementation of shares repurchase on dividend shares (CI_{PSSO}) amounted to 19.401, which was higher than the executed shares buyback of the sample average of 9.770. The median value of 6.197 was greater than the sample average of 0.527. The difference between the average and the median was approximately −5.858 and −15.616, demonstrating that the company's execution of shares buyback provided managers with dividends higher than the average amount of the purchased shares. The average coefficient for employee stock options (CI_{EOP}) was 0.488, which was higher than the average of the sample that did not buy back shares (i.e., 0.244). The difference of the mean and the median was nearly −4.12 and −10.816, indicating that the buying back shares held by managers who recognise employee stock options were higher than the number of equity shares.

For control variables, the information signal hypothesis is supported if the company that implements shares buyback is large (SIZE) and its stock-based compensation rate (RETURN) is below the unexecuted repurchase shares of the company. A company with high cash holdings (FCASH) and free cash flow (FCF) is likely to repurchase its shares, thereby supporting the free cash flow hypothesis. The firms with low debt ratio (LEV) have a high possibility to buy back shares, thereby confirming the financial leverage hypothesis. The managerial incentives hypothesis is also verified given that the firms that repurchase shares with high directors and supervisors pledge ratio (PLEDGE) have a high tendency to buy back shares.

Table 3
Descriptive statistics of research variables

Panel A: All samples (N = 4836)

Variable name	Mean	STDEV	Maximum	Q3	Median	Q1	Minimum
REP	0.018	0.100	1.348	0.000	0.000	0.000	0.000
CI_{PSSO}	11.194	33.163	397.609	7.305	0.839	0.000	0.000
CI_{EOP}	0.280	1.094	9.087	0.000	0.000	0.000	0.000
SIZE	15.314	1.405	21.272	16.065	15.133	14.331	10.387
RETURN	0.231	0.973	8.889	0.455	–0.067	–0.368	–0.943
FCASH	0.204	0.156	0.922	0.279	0.161	0.089	0.000
FCF	0.042	0.082	0.967	0.076	0.047	0.021	–1.780
LEV	0.407	0.180	0.991	0.535	0.407	0.271	0.015
PAYOUT	0.032	0.033	0.475	0.054	0.026	0.000	0.000
PLEDGE	0.085	0.167	1.000	0.091	0.000	0.000	0.000

Symbol description: *, ** and *** in the table indicated significant level of 10%, 5% and 1%. Variable definitions refer to Table 1.

Panel B: Divided into two samples

Variable name	Executed repurchase stock (N = 715)			Non-executed repurchase stock (N = 4121)			Variance verification	
	Mean	S.D.	Median	Mean	S.D.	Median	*t* test	Wilcoxon test
REP	0.122	0.231	0.041	0.000	0.017	0.000	-14.063^{***}	-68.361^{***}
CI_{PSSO}	19.401	42.000	6.197	9.770	31.164	0.527	-5.858^{***}	-15.616^{***}
CI_{EOP}	0.488	1.530	0.000	0.244	0.995	0.000	-4.120^{***}	-10.816^{***}
SIZE	15.484	1.326	15.287	15.285	1.417	15.111	-3.666^{***}	-3.728^{***}
RETURN	0.034	0.558	–0.097	0.266	1.025	–0.061	8.816^{***}	1.910^{*}
FCASH	0.223	0.153	0.181	0.200	0.156	0.158	-3.578^{***}	-4.775^{***}
FCF	0.057	0.051	0.053	0.039	0.086	0.046	-7.436^{***}	-5.047^{***}
LEV	0.395	0.172	0.405	0.410	0.181	0.408	2.084^{**}	1.601^{*}
PAYOUT	0.034	0.028	0.033	0.032	0.033	0.025	-2.152^{**}	-3.911^{***}
PLEDGE	0.101	0.165	0.000	0.082	0.167	0.000	-2.838^{***}	-5.045^{***}

Symbol description: *, ** and *** in the table indicated significant level of 10%, 5% and 1%. Variable definitions refer to Table 1.

Correlation Coefficient Analysis

Table 4 shows the results of the Pearson and Spearman's correlation coefficient analysis. The execution (EXE) and the amount of shares repurchase (REP) are strongly correlated at 0.983, which is significant at 1% level. The combined variable of profit-sharing and managerial overconfidence (CI_{PSSO}*MOC) is also strongly correlated with managerial overconfidence (MOC). The combined variable of the short-term performance bonus and managerial overconfidence

(CI_{SPC}*MOC) has the coefficients 0.813 and 0.916, respectively, and both are significant at 1% level. Some variables that are highly correlated are the combined variables of employee stock options and managerial overconfidence (CI_{EOP}*MOC) and employee equity incentives and managerial overconfidence (CI_{EIC}*MOC), which have a coefficient of 0.866 at 1% level of significance. Most correlation coefficients of the independent and dependent variables reached significant levels. However, some of the correlation coefficients are below 0.3 and have low probabilities.

The correlations between the main explanatory variables and control variables that reach significant levels were examined to determine collinearities through the variance inflation factor (VIF) to avoid bias from parameter estimation. The results show that the correlation coefficients of the independent variables are higher than 0.3. VIF is not equal or larger than 10, thus, the degree of collinearity is trivial.

Regression Analysis Results

This research uses logistic and Tobit regression models and investigates the effect of short-term bonuses, stock incentives, and managerial overconfidence on decisions to repurchase stocks.

Short-term performance bonuses and managerial overconfidence

Table 5 Model 1 shows the coefficient of short-term performance bonuses (CI_{SPC}), which is 0.980 with an odds ratio of 2.666, which are both significant at 1% level. This finding illustrates that in holding other variables constant, the managers with short-term performance bonuses have 2.666 times higher tendency (or 72.72% chance) to execute share repurchase. Hence, managers are highly inclined to execute share repurchase when their company's salary package includes short-term performance bonuses. These results support H1, which is consistent with managerial incentives hypothesis. The coefficient of managerial overconfidence (MOC) is 1.863 with an odds ratio of 6.440, both significant at 1% level. These findings suggest that in holding other variables constant, the overconfident managers have 6.440 times higher possibility (or 86.56% chance) to execute share buybacks, thereby supporting H3. However, the coefficient of the combined variable of overconfident managers with short-term performance bonus (CI_{SPC} * MOC) does not reach the significant level and does not support H4a.

Table 4
Correlation coefficient analysis of Pearson and Spearman (N=4836)

	EXE	*REP*	*SPC*	*EIC*	*PSSO*	*EOP*	*MOC*	CI_{SPC}*MOC	CI_{EIC}*MOC	CI_{PSSO}*MOC	CI_{EOP}*MOC	*SIZE*	*RETURN*	*FCASH*	*FCF*	*LEV*	*PAYOUT*	*PLEDGE*	*IDV*
EXE	1	0.432[a]	0.114[a]	0.228[a]	0.103[a]	0.079[a]	0.325[a]	0.306[a]	0.306[a]	0.165[a]	0.113[a]	0.050[b]	−0.085[a]	0.051[a]	0.075[a]	−0.029	0.028	0.040	0.136[a]
REP	0.983[a]	1	0.063[a]	0.126[a]	0.264[a]	0.225[a]	0.184[a]	0.194[a]	0.201[a]	0.350[a]	0.295[a]	0.217[a]	−0.021	0.029	0.071[a]	0.014	0.037	0.030	0.077[a]
CI_{SPC}	0.114[a]	0.113[a]	1	0.038	0.164[a]	0.034	0.039	0.349[a]	0.060[a]	0.083[a]	0.041	0.167[a]	0.043	0.189[a]	0.274[a]	−0.184[a]	0.506[a]	−0.057[b]	−0.002
CI_{EIC}	0.228[a]	0.227[a]	0.038[a]	1	0.267[a]	0.375[a]	0.184[a]	0.172[a]	0.531[a]	0.193[a]	0.226[a]	0.054[b]	−0.008	0.148[a]	0.113[a]	−0.057[b]	0.057[b]	−0.045	0.362[a]
CI_{PSSO}	0.225[a]	0.230[a]	0.696[a]	0.359[a]	1	0.283[a]	0.100[a]	0.138[a]	0.191[a]	0.629[a]	0.262[a]	0.378[a]	0.013	0.131[a]	0.168[a]	−0.005	0.184[a]	0.008	0.206[a]
CI_{EOP}	0.156[a]	0.156[a]	0.074[a]	0.818[a]	0.221[a]	1	0.129[a]	0.129[a]	0.280[a]	0.314[a]	0.750[a]	0.274[a]	0.009	0.039	0.042	0.031	0.021	0.034	0.154[a]
MOC	0.325[a]	0.323[a]	0.039[a]	0.184[a]	0.134[a]	0.162[a]	1	0.758[a]	0.629[a]	0.330[a]	0.269[a]	0.020	−0.016	0.102[a]	0.048	−0.042	0.001	0.054[b]	0.170[a]
CI_{SPC} *MOC	0.306[a]	0.305[a]	0.349[a]	0.172[a]	0.320[a]	0.187[a]	0.758[a]	1	0.525[a]	0.344[a]	0.245[a]	0.051[c]	0.001	0.134[a]	0.106[a]	−0.078[a]	0.134[a]	0.033	0.141[a]
CI_{EIC} *MOC	0.306[a]	0.306[a]	0.060[a]	0.531[a]	0.245[a]	0.449[a]	0.629[a]	0.525[a]	1	0.400[a]	0.427[a]	0.047	−0.014	0.109[a]	0.087[a]	−0.046	0.046	0.041	0.209[a]
CI_{PSSO} *MOC	0.359[a]	0.359[a]	0.257[a]	0.260[a]	0.385[a]	0.205[a]	0.813[a]	0.916[a]	0.673[a]	1	0.441[a]	0.231[a]	−0.003	0.063[a]	0.095[a]	0.001	0.110[a]	0.042	0.142[a]
CI_{EOP} *MOC	0.234[a]	0.234[a]	0.097[a]	0.460[a]	0.189[a]	0.559[a]	0.545[a]	0.514[a]	0.866[a]	0.553[a]	1	0.202[a]	0.006	0.035	0.044	−0.007	0.035	0.076[a]	0.094[a]
SIZE	0.054[a]	0.071[a]	0.171[a]	0.041[a]	0.309[a]	0.044[a]	0.022	0.050[a]	0.038[a]	0.075[a]	0.035[b]	1	−0.009	−0.186[a]	0.208[a]	0.304[a]	0.122[a]	0.219[a]	−0.094[a]
RETURN	−0.028[c]	−0.024	0.122[a]	−0.040[a]	0.109[a]	−0.032[b]	−0.039[a]	-0.002	−0.027[c]	−0.004	−0.020	0.033[b]	1	0.040	0.110[a]	−0.018	−0.062[a]	−0.019	0.014
FCASH	0.069[a]	0.073[a]	0.220[a]	0.170[a]	0.278[a]	0.173[a]	0.123[a]	0.150[a]	0.129[a]	0.153[a]	0.135[a]	−0.161[a]	0.053[a]	1	0.067[a]	−0.493[a]	0.209[a]	−0.130[a]	0.296[a]
FCF	0.073[a]	0.074[a]	0.293[a]	0.157[a]	0.416[a]	0.076[a]	0.029[b]	0.103[a]	0.112[a]	0.137[a]	0.082[a]	0.164[a]	0.161[a]	0.133[a]	1	−0.140[a]	0.228[a]	0.017	0.008
LEV	−0.023	−0.020	−0.177[a]	−0.047[a]	−0.120[a]	−0.065[a]	−0.035[b]	−0.073[a]	−0.038[a]	−0.048[a]	−0.063[a]	0.324[a]	−0.022	−0.494[a]	−0.163[a]	1	−0.154[a]	0.165[a]	−0.147[a]
PAYOUT	0.056[a]	0.062[a]	0.615[a]	0.081[a]	0.629[a]	0.009	0.014	0.172[a]	0.063[a]	0.189[a]	0.034[b]	0.173[a]	0.069[a]	0.261[a]	0.322[a]	−0.171[a]	1	−0.073[a]	0.049
PLEDGE	0.073[a]	0.077[a]	−0.014	−0.038[a]	−0.015	−0.020	0.085[a]	0.054[a]	0.061[a]	0.067[a]	0.058[a]	0.275[a]	0.004	−0.111[a]	−0.014	0.160[a]	−0.036[b]	1	−0.114[a]
IDV	0.136[a]	0.134[a]	−0.002	0.362[a]	0.210[a]	0.340[a]	0.170[a]	0.141[a]	0.209[a]	0.173[a]	0.186[a]	−0.103[a]	−0.117[a]	0.334[a]	0.084[a]	−0.145[a]	0.042[a]	−0.126[a]	1

Description :
1. Upper right half of the table shows Pearson correlation coefficient, Lower left half shows Spearman correlation coefficient。
2. a, b and c in the table respectively significant level reached 1%, 5% and 10%.
3. Variables definitions refer to Table 1.

Table 5
Empirical results of logistic regression models

Research Variable	Expected Symbol	Model 1		Model 2	
		Coefficient	Odds ratio	Coefficient	Odds ratio
Intercept term	−	−4.092***	0.017***	−3.870***	0.021***
		(−7.73)	(−7.73)	(−7.40)	(−7.40)
CI_{SPC}	+	0.980***	2.666***		
		(6.27)	(6.27)		
CI_{SPC}*MOC	+	−0.257	0.774		
		(−1.31)	(−1.31)		
CI_{EIC}	+			1.136***	3.115***
				(8.69)	(8.69)
CI_{EIC}*MOC	+			−0.437**	0.646**
				(−2.46)	(−2.46)
MOC	+	1.863***	6.440***	1.831***	6.240***
		(11.16)	(11.16)	(14.33)	(14.33)
SIZE	−	0.045	1.046	0.056	1.058
		(1.27)	(1.27)	(1.60)	(1.60)
RETURN	−	−0.384***	0.681***	−0.339***	0.713***
		(−6.57)	(-6.57)	(−5.89)	(−5.89)
FCASH	+	−0.084	0.920	−0.121	0.886
		(−0.24)	(-0.24)	(−0.35)	(−0.35)
FCF	+	2.818***	16.740***	2.785***	16.198***
		(3.54)	(3.54)	(3.67)	(3.67)
LEV	−	0.118	1.125	−0.209	0.812
		(0.38)	(0.38)	(−0.67)	(−0.67)
PAYOUT	−	−5.793***	0.003***	−0.362	0.696
		(−3.47)	(-3.47)	(−0.25)	(−0.25)
PLEDGE	+	0.590**	1.804**	0.574**	1.775**
		(2.25)	(2.25)	(2.17)	(2.17)
IDV	+	0.628***	1.874***	0.249**	1.282**
		(6.36)	(6.36)	(2.38)	(2.38)
Likelihood ratio		625.90***		665.50***	
Pseudo R^2		15.45%		16.42%	

Symbol Description:
1. *, ** and *** in table indicate significant level of 10%, 5% and 1%.
2. Data within bracket is value z.
3. Variables definitions refer to Table 1.

Table 6
Empirical results of Tobit regression models

Research variable	Expected symbol	Model 3	Model 4
Intercept term	−	−1.247***	−1.214***
		(−15.08)	(−14.90)
CI_{SPC}	+	0.095***	
		(4.43)	
CI_{SPC}*MOC	+	0.005	
		(0.16)	
CI_{EIC}	+		0.136***
			(7.08)
CI_{EIC}*MOC	+		−0.031
			(−1.13)
MOC	+	0.248***	0.254***
		(9.73)	(12.68)
SIZE	−	0.046***	0.047***
		(8.79)	(8.95)
RETURN	−	−0.051***	−0.046***
		(−5.69)	(−5.18)
FCASH	+	0.048	0.048
		(0.92)	(0.92)
FCF	+	0.443***	0.409***
		(3.54)	(3.35)
LEV	−	−0.017	−0.055
		(−0.35)	(−1.16)
PAYOUT	−	−0.542**	0.029
		(−2.19)	(0.13)
PLEDGE	+	0.061	0.054
		(1.51)	(1.35)
IDV		0.098***	0.052***
		(6.55)	(3.32)
Likelihood ratio		651.31***	688.98***
Pseudo R^2		22.80%	24.12%

Symbol description:
1. *, ** and *** in this table indicate significant level of 10%, 5% and 1%
2. Data within bracket is value t
3. Variables definitions refer to Table 1

Table 6 Model 3 illustrates that the short-term performance bonuses (CI_{SPC}) coefficient is 0.095 at 1% significant level. Thus, managers with short-term performance bonuses spend additional NTD0.095 million dollars to

repurchase shares. Thus, the short-term performance policies make managers spend additional funds in share buyback for their self-interest. This observation confirms H1. The findings on short-term performance bonuses are also related to the initial conclusions of Marquardt et al. (2009), who stated that the managers' short-term performance compensation significantly influences their implementation of shares buyback (because the managers want to increase their short-term gains). This viewpoint was later supported by Young and Yang (2011). The managerial overconfidence (MOC) coefficient is 0.248 with 1% significance level. Thus, overconfident managers spend additional NTD0.248 million dollars in repurchasing stocks, thereby verifying H3 and the positive relation that the paper earlier posits. This finding also supports the conclusion presented by Shu et al. (2013) and Xi (2011), that is, overconfident managers execute share repurchases because they are optimistic about the company's prospects and think that the market undervalues the company's stock. However, the coefficient of the $CI_{SPC} * MOC$ does not reach the significant level and does not support H4a.

Equity incentive and managerial overconfidence

Table 5 Model 2 illustrates that the equity incentives (CI_{EIC}) coefficient is 1.136 with an odds ratio of 3.115, and both are significant at 1% level. This result indicates that the managers who have stock incentives have 75.70% probability to repurchase stock, thereby supporting H1. This condition suggests that the stock incentive policies make managers decide to buy back shares for self-interest. The positive sign is consistent with the expectations of this study. The managerial overconfidence (MOC) coefficient is 1.831 with an odds ratio of 6.240, which are both are significant at 1% level. Hence, in holding other variables constant, the overconfident managers execute stock repurchases 6.44 times, which suggests that overconfident managers have a high probability to execute shares repurchase. This observation is consistent with H3. However, the coefficient of the combined variables overconfident managers with equity incentives ($CI_{EIC} * MOC$) does not reach the significance level and does not support H4b.

Table 6 Model 4 illustrates that the equity incentives (CI_{EIC}) coefficient is 0.136 with a 1% significance level. This finding illustrates that the managers with stock incentives increase their expenditure on shares repurchase by NTD0.136 million dollars. Thus, the stock incentive policies are positively related to buying back shares, thereby supporting H1. The results are consistent with the studies of Fenn and Liang (1997; 2001), Kahle (2002), and Gong et al. (2008), who earlier discovered that managers with equity incentives take advantage of buying back shares owing to their self-interest of having increased capital gains and to improve the retained earnings performance. Chen et al. (2013) emphasised that when managers hold additional warrants, they are highly inclined to execute shares buyback. The managerial overconfidence (MOC) coefficient is 0.254 with

a 1% significance level. This condition shows that the overconfident managers spend NTD0.254 million dollars in repurchasing stocks, confirming H3. However, the coefficient of the combined variable of overconfident managers with stock incentives ($CI_{EIC} * MOC$) does not reach the significant level and does not support H4b.

Tables 5 and 6 present the control variables. All coefficients of company size (SIZE) are positive and significant at 1% significant level in the Tobit regression model. This condition suggests that large companies in Taiwan are likely to repurchase shares and willing to spend a huge amount of money in buybacks. Large firms also have high free cash flow (FCF), which is consistent with this variable's coefficient and is significant at 1% significance. Hence, the free cash flow hypothesis is supported. The results confirm the studies of Vermaelen (1981) and Ikenberry et al. (1995), who posited that small companies do not attract the attention of analysts and investors but increase the degree of information asymmetry. This circumstance results to the firms' unpopularity with future investors, which is an unlikely case for large firms that are mostly at the center of media and analysts' attention and gain increased investor preference.

The stock return (RETURN) coefficients are also significant at 1% level and are consistent with the expectations of the study, thereby supporting the information signal hypothesis. This result has been explained by Vermaelen (1981), Ikenberry et al. (1995; 2000), and Jagannathan et al. (2000), who clarified that the stock prices undervalued by the market greatly influence the managers to announce share repurchase.

The dividend payout ratio (PAYOUT) coefficients from Models 1 and 3 are in line with the expected negative relations of this research and reach 1% level of significance, thereby confirming the dividend alternative hypothesis. This finding is also consistent with the conclusion of Dittmar (2000), who explained that an increased distribution of cash dividend leads to a less probability of buying back shares or lowers the amount used for the repurchase. All supervisors pledge ratio (PLEDGE) coefficients have significant levels in the logistic regression models and are consistent with the positive expectations of this study. This finding also conforms to the findings of Zhen et al. (2006), who posited that share repurchase may highly be implemented when the company directors have high pledges. The reason behind this condition is the increased approval of the management. The industry (IDV) coefficients are positive, suggesting that companies in the electronics industry carry out share repurchase often and spend a huge amount of capital in buybacks. This study posits that the electronics industry in Taiwan is more profitable compared with other industries. Thus, the increased cash flow created from revenues is used in shares buyback.

Additional Analysis

Table 7 Model 5 shows that the combined variables of overconfident managers and profit-sharing compensation (CI_{PSSO}*MOC) is 0.001 significant at 1% level. This finding suggests that the overconfident managers under a profit-sharing scheme have a relatively high chance to repurchase shares. Table 7 Model 6 features the cross multiplication coefficient of overconfidence managers under an employee stock options benefit (CI_{EOP}*MOC), which has a value of 0.025 and is significant at 5% level. This finding also suggests that the overconfident managers who own employee stock options have a high tendency to spend a huge amount of money to repurchase shares. These results have been explained by Kahle (2002), who concluded that when the ratio of stock option executed by employees is high and when managers hold high stock options, a high amount of fund is used for shares repurchase. Chen et al. (2013) pointed out that managers are highly inclined to buy back shares when they hold extensive amount of warrants. Therefore, all cross multiplication coefficients of the overconfident managers (MOC) under profit-sharing (CI_{PSSO}) and employee stock options policies (CI_{EOP}) are positive and consistent with the expectations of this study. H_{4a} and H_{4b} are correspondingly verified.

Table 7
Result of additional analysis

Research variable	Expected symbol	Model 5	Model 6
Intercept term	?	−1.021 ***	−1.125 ***
		(−11.55)	(−13.25)
CI_{PSSO}	+	4.E−04	
		(1.46)	
CI_{PSSO}*MOC	+	0.001 ***	
		(3.26)	
CI_{EOP}	+		0.001
			(0.11)
CI_{EOP}*MOC	+		0.025**
			(2.42)
MOC	+	0.226 ***	0.234***
		(14.56)	(15.38)
SIZE	?	0.037 ***	0.042 ***
		(6.46)	(7.69)
RETURN	−	−0.048 ***	−0.048 ***
		(−5.50)	(−5.48)

(*continued on next page*)

Table 7: (*continued*)

Research variable	Expected symbol	Model 5	Model 6
FCASH	+	0.047	0.064
		(0.92)	(1.26)
FCF	+	0.452 ***	0.522 ***
		(3.84)	(4.41)
LEV	−	−0.033	−0.025
		(−0.71)	(−0.53)
PAYOUT	−	−0.132	−0.009
		(−0.60)	(−0.04)
PLEDGE	+	0.053	0.042
		(1.37)	(1.07)
IDV	+	0.076 ***	0.085 ***
		(5.15)	(5.77)
Likelihood ratio		649.41 ***	634.66 ***
Pseudo R^2		22.74%	22.22%

Symbol description:
1. *, ** and *** in this table indicate significant level of 10%, 5% and 1%
2. Data within bracket is value t
3. Variables definitions refer to Table 1

CONCLUSIONS AND EXTENSIONS

Shares repurchase is an important financial decision for companies and plays an essential role in stabilising the stock markets. The motivations for share buybacks are diverse but most of them depend on the short- and long-term objectives of the firms' decision-makers, particularly the BOD and managers. Other than the underlying self-interest and related personal motives (i.e., increasing wealth, overconfidence, overestimating the returns of transactions, and undermining risks), agency problems and information asymmetry are also considered factors that influence managers to execute share repurchase. This research investigated whether managerial compensation and incentives and overconfident behaviour affect the decision and the capital used to repurchase shares.

The research sample included the TSEC publicly-listed and OTC-listed companies from 2008 to 2012. The findings showed that the managers who receive short-term performance bonuses or equity incentives and are optimistic toward the company's prospects are highly inclined to repurchase shares. Managers also spend a huge amount of money to finance the buyback. Overconfident managers under profit-sharing and employee stock options schemes have a high chance to repurchase shares and have high tendency to

spend additional capital to buy back shares. In addition, large companies in Taiwan are likely to execute shares repurchase and are willing to spend a huge amount of money. These conditions can be attributed to the large and liquid free cash flows of companies.

This study has a number of relevant contributions by increasing the stakeholders' (i.e., the BOD) and investors' understanding of managers' psychological biases influenced by benefits, compensations, and feelings of overconfidence when making financial decisions, particularly buying back shares. Overconfident managers with excessive compensation packages may make weak or wrong decisions that may prove costly and even disastrous for the firm in the long-run. As the primary decision-maker of large corporate decisions, the BOD implements satisfactory checks and balances to determine the real motives of managers to minimise information asymmetry inside and outside of the business organisation. The BOD can establish rules that limit the CEOs in increasing their shareholdings a year or two before a planned share repurchase or improve regulations on salaries and compensations of managers that create disincentives in opportunistic share buyback schemes. These suggestions lead to high-quality decisions, prevent insider trading that disrupts company valuation, and improve corporate governance.

In spite of its considerable contributions, this study has a number of limitations. This research investigated the relationship between managerial compensation and overconfidence and the tendency to repurchase shares. However, this study only focused on managerial shareholding changes as the proxy for overconfidence. Future studies can consider other proxy variables to cover managerial optimism. Future research can also look into other topics such as the tendency of Taiwanese managers to select types of financing (i.e., debt, equity, or a mix) or to identify the tendency to build business empires through mergers and acquisitions. The private sector and government-owned and -controlled corporations with a substantial number of shareholders can also be considered in future studies.

REFERENCES

Ahmed, A. S., & Duellman, S. (2013). Managerial overconfidence and accounting conservatism. *Journal of Accounting Research, 51*, 1–30.

Alicke, M. D. (1985). Global self-evaluation as determined by the desirability and controllability of trait adjectives. *Journal of Personality and Social Psychology, 49*, 1621–1630.

Andriosopoulos, D., Andriosopoulos, K., & Hoque, H. (2013). Information disclosure, CEO overconfidence, and share buyback completion rates. *Journal of Banking and Finance, 37*, 5486–5499.

Bagwell, L. S. (1991). Share repurchase and takeover deterrence. *RAND Journal of Economics, 22*(1), 72–88.

Bagwell, L. S., & Shoven, J. B. (1988). Share repurchases and acquisitions: An analysis of which firms participate. *National Bureau of Economic Research*, 191–220.

Bens, D. A., Nagar, V., Skinner, D. J., & Wong, M. H. F. (2003). Employee stock options, EPS dilution, and stock repurchases. *Journal of Accounting and Economics, 36*, 51–90.

Brown, R., & Sarma, N. (2007). CEO overconfidence, CEO dominance and corporate acquisitions. *Journal of Economics and Business, 59*, 358–379.

Chen, A. L., & Lu, C. S. (2015). The effect of managerial overconfidence on the market timing ability and post-buyback performance of open market repurchases. *North American Journal of Economics and Finance*, *33*(July), 234–251.

Chen, C. J., Lin, W. H., & Hsu, C. Y. (2013). CEO equity incentive: A motivation behind share repurchases. *Working Paper.* Accounting Theory and Practice Seminar.

Comment, R., & Jarrell, G. A. (1991). The relative signaling power of dutch-auction and fixed-price self-tender offers and open-market share repurchases. *The Journal of Finance, 46*, 1243–1271.

Dann, L. Y. (1981). Common stock repurchases: An analysis of returns to bondholders and stockholders. *Journal of Financial Economics, 9*, 113–138.

Deshmukh, S., Goel, A. M., & Howe, K. M. (2013). CEO overconfidence and dividend policy. *Journal of Financial Intermediation, 22*, 440–463.

Dittmar, A. K. (2000). Why do firms repurchase stock? *Journal of Business, 73*(3), 331–355.

Doukas, J. A., & Petmezas, D. (2007). Acquisitions, overconfident managers and self-attribution bias. *European Financial Management, 13*(3), 531–577.

Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The Journal of Finance, 25*(2), 383–417.

Fenn, G. W., & Liang, N. (1997). Good news and bad news about share repurchases. (*Working Paper*). Washington, DC: Board of Governors of the Federal Reserve.

Fenn, G. W., & Liang, N. (2001). Corporate payout policy and managerial stock incentives. *Journal of Financial Economics, 60*(1), 45–72.

Gervais S., Heaton, J. B., & Odean, T. (2011). Overconfidence, compensation contracts, and capital budgeting. *The Journal of Finance, 66*(5), 1735–1777.

Gong, G., Louis, H., & Sun, A. X. (2008). Earnings management and firm performance following open-market repurchases. *The Journal of Finance, 63*(2), 947–986.

Grullon, G., & Michaely, R. (2002). Dividends, share repurchases, and the substitution hypothesis. *The Journal of Finance, 57*(4), 1649–1684.

Hirshleifer, D., Low, A., & Teoh, S. H. (2012). Are overconfident CEOs better innovators? *The Journal of Finance, 67*(4), 1457–1498.

Hovakimian, T. Opier, D., & Titman, S. (2001). The debt-equity choice. *Journal of Financial and Quantitative Analysis, 36*(1), 1–24.

Hribar, P., Jenkins, N., & Johnson, W. B. (2006). Stock repurchases as an earnings management device. *Journal of Accounting and Economics, 41*(1–2), 3–27.

Hu, J. W. S., & Chuan, C. H. (2006). The relationships among share repurchases, employee stockownership plan and real investment expenditure in Taiwan: An empirical study. *International Journal of Management, 23*(1), 103–112.

Ikenberry, D., Lakonishok, J., & Vermaelen T. (2000). Stock repurchases in Canada: Performance and strategic trading. *The Journal of Finance, 55*(5), 2373–2397.

Ikenberry, D., Lakonishok, J., & Vermaelen, T. (1995). Market underreaction to open market share repurchases. *Journal of Financial Economics, 39*, 181–208.

Jagannathan, M., Stephens, C. P., & Weisbach, M. S. (2000). Financial flexibility and the choice between dividends and stock repurchases. *Journal of Financial Economics, 57*, 355–384.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeover. *American Economic Review, 76*(2), 323–329.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305–360.

Jolls, C. (1998). The role of incentive compensation in explaining the stock repurchase puzzle. (*Working Paper*). Cambridge, MA: Harvard Law School.

Kahle, K. M. (2002). When a buyback isn't a buyback: Open market repurchases and employee options. *Journal of Financial Economics, 63*, 235–261.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica, 47*, 263–291.

Langer, E. (1975). The illusion of control. *Journal of Personality and Social Psychology, 32*, 311–328.

Lin, Y. H., Hu, S. Y., & Chen, M. S. (2008). Testing pecking order prediction from the viewpoint of managerial optimism: Some empirical evidence from Taiwan. *Pacific-Basin Finance Journal, 16*, 160–181.

Malmendier, U., & Tate, G. (2008). Who makes acquisitions? CEO overconfidence and the market's reaction. *Journal of Financial Economics, 89*, 20–43.

March, J. G., & Shapira, Z. (1987). Managerial perspectives on risk and risk taking. *Management Science, 33*(11), 1404–1418.

Marquardt, C., Tan, C., & Young, S. (2009). Accelerated share repurchases, bonus contracts, and CEO horizons. (*Working paper*). City University of New York.

Miller, D. T., & Ross, M. (1975). Self-serving bias in attribution of causality: Fact or fiction? *Psychological Bulletin, 82*, 213–225.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decision when firms have information that investors do not have. *Journal of Financial Economics, 13*, 187–221.

Netter, J. M., & Mitchell, M. L. (1989). Stock-repurchase announcements and insider transactions after the October 1987 stock market crash. *Financial Management, 18*, 84–96.

Shu, P. G., Yeh, Y. H., Chiang, T. L., & Hung, J. Y. (2013). Managerial overconfidence and share repurchases. *International Review of Finance, 13*(1), 39–65.

Vermaelen, T. (1981). Common stock repurchases and market signaling: An empirical study. *Journal of Financial Economics, 9*(2), 139–183.

Weinstein, N. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology, 39*, 806–820.

Wu, H. C. (2010). The study on the relationship between CEO overconfidence and open market share repurchases. Unpublished Master's thesis. Department of Finance, National Chung Cheng University.

Young, S., & Yang, J. (2011). Stock repurchases and executive compensation contract design: The role of earnings per share performance conditions. *The Accounting Review, 86*(2), 703–733.