ISSN 1023-2842
中山管理評論　　2015 年六月號
第二十三卷第二期　　p.591-629
DOI: 10.6160/2015.06.03

經理人持股與股利政策－論經理人過度自信之角色

Management Ownership and Dividend Policy: The Role of Managerial Overconfidence

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Suggested Citation: Lu, C. S., 2015, "Management Ownership and Dividend Policy: The Role of Managerial Overconfidence," **Sun Yat-sen Management Review**, Vol. 23, No. 2, 591-629.

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摘要

本研究主要探討台灣上市櫃公司，經理人持股與股利政策間關係是否受到經理人過度自信影響。實證結果顯示，經理人持股與股利支付之間呈現非單調線性關係。重要的是，經理人過度自信影響經理人持股與股利政策之間的非單調線性關係。縱使經理人持股足以有效控制公司，並藉由調降股利而掠奪股東利益，然而過度自信經理人因高估公司未來的現金流入及展望，調降股利的意圖相對低於非過度自信者，故股利調降幅度相對較小。此外持股偏高下，經理人透過高額股利以降低投資過度集中的風險，但過度自信經理人高估個人能力、公司投資計畫的價值，甚至低估投資風險，選擇保留公司盈餘以應付公司未來的資金需求。故股利支付隨著持股增加的幅度，相對低於非過度自信經理人。最後本研究證實經理人過度自信能夠減緩因經理人地位鞏固所造成股利調降的利益掠奪效果。

關鍵詞：經理人持股、經理人過度自信、股利政策、掠奪效果

Abstract

This paper examines whether the relationship between management ownership and dividend policies is subject to the influence of managerial overconfidence among listed companies in Taiwan. The empirical study suggests a non-linear relationship between management ownership and dividend payouts. Most importantly, this study finds that managerial overconfidence affects the non-monotonic linear relationship between management ownership and dividend payout policies. Even when management ownership is sufficient to effectively control the company and managers seek to expropriate the shareholders' interests by reducing payouts, overconfident managers will have a weaker intention to reduce payouts than non-overconfident managers because overconfident managers overestimate future cash flows and prospects. Whilst managers may resort to high

payouts to reduce the risk of wealth concentration due to high management ownership, overconfident managers will overestimate their personal capabilities and project values or even underestimate investment risks. As a result, they choose to retain earnings to meet future capital needs. The rate with which payouts increase along with ownership is lower for overconfident managers than for non-overconfident managers. Finally, this paper shows that managerial overconfidence lessens the entrenchment effects due to the strengthened position of managers and the resulting payout reductions.

Keywords: Management Ownership, Managerial Overconfidence, Dividend Policy, Entrenchment Effect

1. INTRODUCTION

Dividend policies are considered a key corporate financial strategy. Despite extensive literature in finance regarding dividend policies, many issues have yet to thoroughly be clarified. Previous literature examines dividend policies from the perspectives of agency problems, information asymmetry and taxations, and studies on management ownership and dividend policies are based on the presumption of managers being rational (Eckbo & Verma, 1994; Fenn & Liang, 2001; Carney & Gedajlovic, 2002; Short et al., 2002; Chen et al., 2005). However, previous studies suggest that biased behavior due to managerial overconfidence affects the investment decisions of firms (Malmendier & Tate, 2005, 2008; Ben-David et al., 2013). Hence, it is important to explore how the combined effects of managerial overconfidence and management ownership structures influence dividend policies. This paper believes such an approach fills in the gap of existing literature on dividend policies. Meanwhile, scholars usually use management holdings to evaluate the influence of managers over firm decisions. For instance, Morck et al. (1988) refer to management ownership; Himmelberg et al. (1999) look

into insider ownership; Kim & Lu (2011) examine CEO ownership; and Chen et al. (2014) use controlling shareholder states as a proxy for management ownership. Claessens et al. (2000) argue that the prevalence of pyramid structures or cross-holdings in East Asia (including Taiwan) lead to the phenomena of controlling families or controlling groups. Chen et al. (2014) believe that senior managers in Taiwan could be the controlling shareholders or controlling families. Therefore, CEO ownership or management ownership may understate the influence of managers over firms. This paper contests that management ownership is not a perfect indicator of the influence of managers as agents in Taiwan. Therefore, the control of the shareholders' cash flow right is used as a proxy variable of managerial power in the study of dividend policies. Based on the above motives, this paper investigates whether managerial overconfidence affects the relationship between agency problems and dividend payouts as a result of management ownership.

In addition, this paper measures managerial overconfidence using three indicators. The first reference is Malmendier & Tate (2005), who define overconfident managers according to the net purchase of company shares during a year. Managers are restricted in the transfer of firm shares and cannot hedge risks by shorting. Hence, they only purchase additional shares when they are confident about the prospect or future profitability of a firm. Campbell et al. (2011) suggest that investment decisions imply the presence of managerial overconfidence. This paper refers to Ahmed & Duellman (2013) by measuring the level of managerial overconfidence by capital expenditures, and refers to Schrand & Zechman (2012) by examining the investing and financing activities to come up with an integrated indicator of managerial overconfidence. Also, past studies indicate that dividend policies are a function of growth opportunities, cash flows, firm size and debt ratios. The larger a firm or the higher the cash flow, the more likely high dividend payouts will be. If there are growth opportunities and leverage is high, companies tend to retain earnings and have lower dividend payouts (Smith & Watts, 1992; Fama & French, 2001, 2002; Fenn & Liang, 2001). However, Lin & Shen (2012) find the positive correlation between dividend and investment opportunity in firms with weak corporate governance. This paper incorporates these variables as control

variables in the empirical model in order to control the influence of firm characteristics on dividend policies.

This study finds a non-monotonic linear relationship between management ownership and dividend policies. If management ownership is lower than 10%, there is a positive correlation between ownership and payout ratios. This shows managers want to win the support of external shareholders, protect their own interests and secure their positions in the company by issuing dividends. If management ownership is 10%~20%, the higher percentage indicates lower payments. This indicates the misappropriation of shareholders' wealth due to entrenchment effects. However, the correlation between management ownership and payout levels becomes positive again once management stakes exceed 20%. Managers opt for large payouts because it diversifies their investment risk and avoids asset concentration. It is worth noting that overconfident managers overestimate future cash flow and prospects. As a result, the dividend payout reduction is significantly lower in the case of overconfident managers than in the case of non-overconfident managers. In other words, overconfidence mitigates the adverse effects of management entrenchment on shareholders' wealth. Moreover, overconfident managers overestimate their own ability and investment project values and even underestimate investment risks, and they continue to retain earnings to fund future needs. In other words, overconfident managers with high ownership are not willing to pay dividends. Therefore, dividend payout increase is lower in the case of overconfident managers than in the case of non-overconfident managers.

The remainder of this paper is organized as follows: Section 2 presents literature review. Section 3 describes the research design and data definitions. Section 4 presents the empirical results. Robustness tests are in Section 5. Finally, Section 6 concludes the paper.

2. LITERATURE REVIEW

This paper examines dividend policies in the context of the interaction between management ownership and managerial overconfidence. Jensen (1986) suggests that managers tend to retain earnings, rather than dividend payouts to shareholders, in order to support firm growth and pursue their own interests. Therefore, cash dividends are considered the solution to agency problems. In other words, the lower the management ownership, the better the payouts can mitigate agency problems (Jensen & Meckling, 1976; Rozeff, 1982; Jensen, 1986). Eckbo & Verma (1994) find that with higher management ownership, the payouts will be lower. Also, once managers have the absolute majority of voting rights, they stop paying out any cash dividends. Fenn & Liang (2001) suggest a negative relationship between management ownership and dividend payouts. Other studies also support that the higher the management ownership is, the lower the dividend payouts will be (Short et al., 2002; Chen et al., 2005). Faccio et al. (2001) indicate that if there are controlling shareholders and the interests of the major and minority shareholders are not aligned, cash dividends can mitigate the agency problem between the two and alleviate the concerns that minority shareholders have about misappropriation of their wealth. In contrast, Carney & Gedajlovic (2002) argue that there is a positive relationship between insider ownership and dividends. Huang et al. (2012) notice a non-monotonic linear relationship between the right to cash flow and the level of payouts among family enterprises in Taiwan.

This paper argues that there are no consistent conclusions in existing literature regarding the relationship between management ownership and dividend payouts. This is particularly true concerning the non-monotonic linear relationship between management ownership and agency costs. Morck et al. (1988) suggest a non-monotonic linear relationship between management ownership and firm values. McConnell & Servaes (1990) find a curvy relationship between insider ownership and Tobin's Q. Chen et al. (2014) indicate that the relationship between controlling shareholder stakes and firm performance is in an inverted U shape.

According to Claessens et al. (2000), principal-principal agency problems are commonplace in the majority of countries in East Asia (including Taiwan) due to

controlling families or controlling groups via pyramid structures or crossholdings. As a result, controlling shareholders do not pursue value-maximizing strategies. For example, they opt for retained earnings (rather than dividends) at the expense of the interests of minority shareholders (DeAngelo et al., 2008; Young et al., 2008). Studies show that if management ownership falls below a certain threshold, the managers will not be entrenched in the firm and will be exposed to the threat of losing control (Morck et al., 1988). Therefore, this paper infers that managers prefer dividend payouts as a means of sustaining their personal wealth or status in the firm if the level of management ownership is low. Put differently, there is a positive correlation between management ownership and dividend payouts at a low level of management ownership. On the contrary, if management ownership is high enough to effectively control firm decisions or establish entrenchment, managers may seek to increase their own personal interests (Morck et al., 1988; Shleifer & Vishny, 1997). Once management ownership reaches an optimal level, managers may choose to retain earnings according to their own discretion, rather than distribute earnings to shareholders. Hence, the relationship between management ownership and dividend payouts is negative. Meanwhile, once managers own substantial stakes, the wealth of the managers is closely related to the resources of the firm and the retained earnings concentrate firm-specific risk (Fama & Jensen, 1983; Demsetz & Lehn, 1985). This paper argues that, in such instances, managers will seek to mitigate the risks of concentrated portfolios with diversifications and large cash dividends to facilitate asset reallocation. Therefore, the relationship between management ownership and dividend payouts is positive. Managers will show a preference for dividends to retained earnings. However, if managers believe their positions are secure, they will attempt to monopolize firm resources at the expense of the shareholders' benefits.

This paper believes that once management ownership is sufficient to sustain control, the higher the management ownership is, the lower the dividend payouts will be. If ownership management exceeds a certain level, managers will be willing to pay out large dividends to reduce the risk to their own capital. Consistent with previous studies, this paper argues that the relationship between management ownership and dividend policies should be non-linear.

Previous literature indicates that firm decisions over investments are significantly influenced by managerial overconfidence (Malmendier & Tate, 2005, 2008; Campbell et al., 2011; Ben-David et al., 2013). Scholars believe that overconfident people tend to think they are more outstanding than others and brag about their capabilities. They contribute to their own abilities for success but put the blame on luck or other factors for any failure (Miller & Ross, 1975; Alicke, 1985). According to the hubris hypothesis by Roll (1986), overconfident managers overestimate their ability to create value, so they become involved in mergers and acquisitions. Heaton (2002) mentions that overconfident managers believe the capital market underestimates firm values and will decline investments that require external funding. On the other hand, they may also overestimate the value of investment targets and invest in projects with negative net present values. In fact, overconfident managers exhibit financing preferences that are consistent with the pecking order theory. Malmendier & Tate (2005) also suggest that overconfident managers overestimate the returns to project investments. If there is ample internal funding, they will go for bigger investments. If not, they will be unwilling to issue new shares to raise funds because they think the company shares are undervalued by the market. Ben-David et al. (2007) find that overconfident managers overestimate cash flow from investment projects and underestimate investment risks, leading to excess investments. Malmendier & Tate (2008) indicate that overconfident managers overestimate their capability to create value and overpay for acquisitions or engage in value-destructive acquisitions. Hackbarth (2008) argues that overconfident managers have optimistic evaluations of the return on investment and exhibit financing preferences in line with the pecking order theory. Scholars also point out that neither investment or financing decisions alone can explain dividend policies. They think that overconfident managers may need to make large investments in the future and reduce dividend payouts dramatically (Ben-David et al., 2007; Deshmukh et al., 2013). If overconfident managers overestimate the value of a new investment and believe the external funding cost is higher than the internal funding cost going forward, they will opt for low dividend payouts and retain earnings to fund future needs.

Moreover, Hilary & Hsu (2011) notice that overconfident managers cannot

accurate predict future earnings. Hribar & Yang (2013) indicate that overconfident managers exhibit over-optimism for daily operations and as a result, they continuously overestimate future cash flow or set up aggressive profitability targets. In words, their earnings forecasts are often a miss and they have to attain earnings goals through earnings management. Schrand & Zechman (2012) suggest that overconfident managers overestimate success rates and release upbeat earnings forecasts. To achieve their own forecasts, they resort to financial reporting fraud or earnings management. DeAngelo et al. (1996) indicate that overconfident managers exhibit behavior bias due to over-optimism. They overestimate future earnings and pay high dividends even in the case of dim prospects. DeAngelo et al. (2008) argue that the behavior bias of managers and preferences of controlling shareholders are the key factors of dividend policies. Wu & Liu (2011) propose that overconfident managers pay out high dividends because of their expectations of high cash flow from current investments. Balachandran et al. (2013) suggest that pride and egotism are the two characteristics of overconfident managers. Also, the relationship between managerial overconfidence and dividend policies determine how the two factors interact with each other. Pure pride leads to low payouts, whilst pure egotism leads to high payouts. This paper argues that overconfident managers also overestimate the probability of future profits and underestimate the probability of future losses and as a result, they issue high dividends.

In sum, this paper examines whether the relationship between management ownership and dividend payouts is subject to the influence of managerial overconfidence. It also infers that even at a certain moderate level of management ownership, secured positions, and decision rights, managerial overconfidence overrides the motivation to retain earnings, reduce payouts, and ignore the interest of minority shareholders. Rather, overconfident managers overestimate future earnings and underestimate investment risks. As a result, the reduction of payouts is lower in the case of overconfident managers than in the case of non-overconfident managers. Meanwhile, asset overconcentration in a specific firm will prompt managers to increase payouts so that they can diversify risks and reallocate assets. However, overconfident managers may overestimate their ability to create value, as well as probability for future investments. Therefore, the increase in

dividend payouts may be lower in the case of overconfident managers than in the case of non-overconfident managers.

3. RESEARCH DESIGN

3.1 Data Sources

This paper comprises all the listed firms in Taiwan during the 1997-2013. The financial and insurance industries are excluded due to the unique nature of their accounting information. This paper sources information from the Taiwan Economic Journal regarding dividends, cash flow rights, market values, management ownership, capital expenditures, total assets, long-term debts, revenues, mergers and acquisitions, convertible bonds, preferred shares, book values of shareholders' equity, and earnings before interests, taxes, depreciation and amortization (EBITDA). Finally, this paper eliminates samples with incomplete variable data to obtain 15,088 firm-year observations.

3.2 Variable Definitions

The research variables in this paper are dividend payout ratios, management ownership, managerial overconfidence and other control variables.

1. Dividend payout ratio (*DIV*)

This paper refers to Fenn & Liang (2001) and Deshmukh et al. (2013) by defining the dividend payout ratio as cash dividends divided by firm market values.

2. Management ownership (*CFR*)

Claessens et al. (2000) argue that the prevalence of pyramid structures or cross-holdings in East Asia (including Taiwan) lead to the controlling families or controlling groups. Chen et al. (2014) show that managers in Taiwan could be the controlling shareholders or controlling families. Therefore, CEO ownership

or managerial ownership may understate the management influence of Taiwanese firms. Therefore, this paper uses the cash flow rights of controlling shareholders as the proxy for management ownership.

3. Managerial overconfidence

The three proxy variables for managerial overconfidence are defined as follows:

(1) Net purchase (*PURCHASE*): Malmendier & Tate (2005) define managerial overconfidence using the net purchase of firm shares by managers during the current year. Managers only buy additional shares when they are confident about company prospects or profitability because they are restricted from selling shares and cannot hedge risks by shorting. This paper refers to Campbell et al. (2011) and Ahmed & Duellman (2013) by defining net purchases of company shares by managers during the current year as the top 20% of the sample. Overconfident managers are defined as those whose stakes grow by over 10% during the year, and the denotation is *PURCHASE* = 1 (otherwise *PURCHASE* = 0).

(2) Capital expenditure (*CAPEX*): This paper suggests that the investment decisions of a firm are related to managerial overconfidence. Overconfident managers go for large capital expenditures (Malmendier & Tate, 2005, 2008; Ben-David et al., 2013). Campbell et al. (2011) suggest that the abovementioned investment decisions imply significant information regarding the level of managerial overconfidence. This paper refers to Ahmed & Duellman (2013) by defining managerial overconfidence with the ratio of the annual capital expenditures of the current year divided by the total assets of the previous year higher than the median of the industry. The denotation of managerial overconfidence is *CAPEX* = 1 (otherwise *CAPEX* = 0).

(3) Integrated index of overconfidence (*TOC*): This paper refers to Schrand & Zechman (2012) by using four indicators in investing and financing activities associated with managerial overconfidence. These four indicators are integrated into an integrated index for managerial overconfidence. It is assumed managerial overconfidence affects firm decisions; therefore, firm decisions can be used to gauge the level of managerial overconfidence. At

least two out of four indicators are indicative of managerial overconfidence, and the denotation is *TOC* = 1 (otherwise *TOC* = 0). The four indicators are explained as follows:

a. Industry-adjusted excess investments (*EXIN*): This paper conducts a regression analysis on the asset growth (vs. revenue) of the companies in the same industry during the year. If the residual of a company is higher than the mean residual in the industry during the year, the managers are considered overconfident and the denotation is *EXIN* = 1 (otherwise *EXIN* = 0).

b. Industry-adjusted M&A activities (*ACQUIRE*): Malmendier & Tate (2008) believe that overconfident managers are likely to overestimate M&A activities or engage in M&A deals that are detrimental to firm values. This paper defines the presence of managerial overconfidence when the M&A value of a company is higher than the industry median, and the denotation is *ACQUIRE* = 1 (otherwise *ACQUIRE* = 0).

c. Industry-adjusted debt ratio (*DER*): Malmendier et al. (2011) indicate that managers exhibit overconfidence if a firm's leverage is higher than the industry median. This paper defines debt ratio as long-term debts divided by firm market value. If a company's debt ratio during the year is higher than the industry median, its managers are considered overconfident. This is denoted as *DER* = 1 (otherwise *DER* = 0).

d. Risk (*RISKY*): Ben-David et al. (2007) suggest that overconfident managers opt for the issue of risky and long-maturity debts. This paper refers to Schrand & Zechman (2012) by defining managerial overconfidence with the issue of convertible bonds or preferred shares during the year, denoted as *RISKY* = 1 (otherwise *RISKY* = 0).

4. Growth opportunities (*GROWTH*)

This paper refers to Deshmukh et al. (2013) by defining growth opportunities as the market value of firm assets divided by the book value of firm assets. Market values are the market value of equity plus the net difference between the book value of total assets and the book value of equity. It is expected to show a negative correlation with dividends.

5. Firm size (*LnSALE*)

The natural logarithm of net revenue is the proxy variable of firm size. It is expected to report a positive correlation with dividend payouts.

6. Cash flow (*CASH*)

This paper refers to Fenn & Liang (2001) by defining cash flow as EBITDA divided by the book value of the total assets. It is expected to exhibit a positive correlation with dividends.

7. Debt ratio (*LEVERAGE*)

This paper defines debt ratio as long-term debts divided by total assets. It is expected to be negatively correlated with dividends (Fenn & Liang, 2001; Fama & French, 2002).

3.3 Descriptive Statistics

Table 1 summarizes the descriptive statistics of the research variables during the 1997-2013. The mean of the dividend payout ratio (*DIV*) of the sample is 2.7%, and the median is 1.8%, indicating right skewness. The mean of management ownership is 24.3%, and the median is 20.8%. The net purchases of company stocks (*PURCHASE*) are an indication of managerial overconfidence. This paper finds 15% of the sampled companies have overconfident managers; meanwhile, 47% of the sampled companies show managerial overconfidence as far as capital expenditures (*CAPEX*) is concerned. The integrated index for managerial overconfidence (*TOC*) suggests that 31.3% of the sample has overconfident managers. The proxy for growth opportunity (*GROWTH*) reports a mean of 1.42 and a median of 1.16. As far as firm sale (*SALE*) is concerned, the mean revenue of the sample is NT$11.1 billion and the median is NT$2.2 billion, indicating a right skewness. The cash flow (*CASH*), defined as EBITDA divided by the total assets, indicates a mean of 7.5% and a median of 8%. Finally, the mean of the debt ratio (*LEVERAGE*) is 37.8% and the median is 37%.

Table1: Summary Statistics

Variable	Mean	Median	Min	Max	StDev
DIV	0.027	0.018	0	0.475	0.030
CFR	0.243	0.208	0	0.977	0.171
PURCHASE	0.150	0	0	1	0.357
CAPEX	0.470	0	0	1	0.499
TOC	0.313	0	0	1	0.464
GROWTH	1.415	1.157	0.279	28.836	0.917
SALE($millions)	11,065	2,196	0.252	3,263,000	67,477
CASH	0.075	0.080	-8.802	1.143	0.139
LEVERAGE	0.378	0.370	0.005	0.991	0.171

Note: This table presents summary statistics for variables used in this study. *DIV* is the ratio of total dividends to market value of equity. *CFR* is controlling shareholder's cash flow right. *PURCHASE* is equal to one if the CEO's net purchases are in the top 20% of the distribution of net purchases by all CEO each year and those purchases increase their ownership in the firm by 10%, zero otherwise. *CAPEX* is equal to one if the capital expenditures deflated by lagged total assets is greater than the median of capital expenditures for the firm's Fama-French industry, zero otherwise. *TOC* is equal to one if the firm meets the requirements of at least 2 of 4 criteria, zero otherwise, where the criteria includes that 1)the firm's excess investment is greater than the median of excess investment of the firm's Fama-French industry, 2)the firm's industry-adjusted net dollars of acquisitions made by the firm are greater than 0, 3)the firm's industry-adjusted debt to equity ratio is greater than zero, 4)if the firm uses either convertible debt or preferred stock during the year. *GROWTH* equals the ratio of the market value of assets to the book value of assets, where the market values are the market value of equity plus the net difference between the book value of total assets and the book value of equity. *SALE* equals to the net sales of the firm. *LnSALE* equals to the natural logarithm of net sales. *CASH* equals the ratio of EBITDA to book value of assets. *LEVERAGE* equals the ratio of long-term debt to book value of total assets.
Data source: this research

Table 2 shows two sub-samples, one with overconfident managers and the other without overconfident managers. Panel A of Table 2 suggests that the dividend payout ratio (*DIV*), growth opportunities (*GROWTH*), firm size (*SALE*) and cash flow (*CASH*) of the companies with overconfident managers are all significantly higher than those of the companies without overconfident managers.

Secondly, the average management ownership (*CFR*) for the companies with overconfident managers is 22.3%, which is lower than 24.7% for the companies without overconfident managers. In the companies whose managers are overconfident, the means of the capital expenditures (*CAPEX*) and the integrated index for managerial overconfident (*TOC*) are 51.8% and 39.6%, respectively, which are both significantly higher than 46.1% and 29.8%, respectively, among the companies whose managers are not overconfident. The preliminary results indicate a level of consistency in the three variables of managerial overconfidence. In the meantime, Panel B shows that, for the subgroup of overconfident managers and for the variable capital expenditures (*CAPEX*), dividend payout ratios (*DIV*), growth opportunities (*GROWTH*), firm size (*SALE*) and cash flow (*CASH*) are all significantly higher than the subgroup of non-overconfident managers. Also, in the companies with overconfident managers, the means of the net purchase of shares (*PURCHASE*) and the integrated index for managerial overconfidence (*TOC*) are 16.5% and 38.3%, respectively, which are significantly higher than 13.6% and 25% for the firms without overconfident managers. The findings suggest that, in the subgroup of overconfident managers, for capital expenditures (*CAPEX*), both the net purchase of shares (*PURCHASE*) and the integrated index for managerial overconfidence (*TOC*) are significantly higher. In other words, there is consistency across the three variables. Finally, Panel C highlights that, in the subgroup of overconfident managers as measured by the integrated index for managerial overconfidence (*TOC*), firm size (*SALE*), cash flow (*CASH*) and debt ratios (*LEVERAGE*) are all significantly higher than the subgroup of non-overconfident managers. In the sampled companies with overconfident managers, debt ratios are higher. However, the mean of management ownership (*CFR*) at 22.3% and the mean of growth opportunities (*GROWTH*) at 1.34 are both significantly lower than those companies without overconfident managers. Finally, in the subgroup of overconfident managers measured by the integrated index (*TOC*), the net purchase of shares (*PURCHASE*) and capital expenditures (*CAPEX*) are 18.9% and 57.6%, respectively, which are significantly higher than 13.2% and 42.2% for those companies without overconfident managers. The preliminary findings suggest consistency for all three indicators of managerial overconfidence.

Table 2: Mean and Median Differences in Managerial Overconfidence Measures

Panel A: By *PURCHASE*						
Variable	*PURCHASE* = 1 N = 2,257		*PURCHASE* = 0 N = 12,831			
	Mean	Median	Mean	Median	t-value	z-value
DIV	0.030	0.025	0.026	0.017	6.70	8.19
CFR	0.223	0.186	0.247	0.212	-6.30	-6.45
CAPEX	0.518	1.000	0.461	0.000	5.01	5.01
TOC	0.396	0.000	0.298	0.000	8.84	9.23
GROWTH	1.470	1.234	1.405	1.145	3.27	6.79
SALE($millions)	16,310	3,364	10,142	2,050	4.13	15.08
CASH	0.088	0.089	0.073	0.078	5.54	7.06
LEVERAGE	0.377	0.376	0.378	0.368	-0.12	1.06
Panel B: By *CAPEX*						
Variable	*CAPEX* = 1 N = 7,089		*CAPEX* = 0 N = 7,999			
	Mean	Median	Mean	Median	t-value	z-value
DIV	0.028	0.021	0.026	0.014	4.29	7.87
CFR	0.242	0.208	0.245	0.206	-0.88	0.48
PURCHASE	0.165	0	0.136	0	4.99	5.01
TOC	0.383	0	0.250	0	17.66	17.60
GROWTH	1.497	1.223	1.341	1.111	10.41	13.75
SALE($millions)	12,464	2,413	9,825	2,014	2.42	10.94
CASH	0.099	0.096	0.055	0.065	20.00	25.50
LEVERAGE	0.380	0.377	0.376	0.362	1.37	3.21
Panel C: By *TOC*						
Variable	*TOC* = 1 N = 4,716		*TOC* = 0 N = 10,372			
	Mean	Median	Mean	Median	t-value	z-value
DIV	0.027	0.020	0.026	0.017	0.83	3.02
CFR	0.230	0.197	0.250	0.213	-6.75	-6.05
PURCHASE	0.189	0	0.132	0	8.76	9.23
CAPEX	0.576	1	0.422	0	17.79	17.60
GROWTH	1.359	1.163	1.440	1.154	-5.57	0.85
SALE($millions)	18,882	2,931	7,511	1,938	6.96	18.61
CASH	0.083	0.081	0.072	0.078	5.37	2.90
LEVERAGE	0.434	0.429	0.352	0.334	30.10	30.58

Note: This table presents descriptive statistics by overconfidence. All variables are defined in table1.
Date source: this research

4. EMPIRICAL RESULTS

This paper uses ordinary least square (OLS) and the Tobit censored regression model to explore the non-monotonic linear relationship between management ownership (*CFR*) and dividend payouts (*DIV*). Meanwhile, the interactive terms between managerial overconfidence (*MOC*) and management ownership (*CFR*) of equation (1) examine whether managerial overconfidence moderates the relationship between management ownership and dividend payouts.

$$\begin{aligned} DIV_{it} &= \alpha_0 + \alpha_1 CFR_{it} + \alpha_2 D_1\left(CFR_{it} - 0.1\right) + \alpha_3 D_2\left(CFR_{it} - 0.2\right) + \alpha_4 MOC_{it} \\ &\quad + \alpha_5 MOC_{it} \times D_1\left(CFR_{it} - 0.1\right) + \alpha_6 MOC_{it} \times D_2\left(CFR_{it} - 0.2\right) \\ &\quad + \alpha_7 GROWTH_{it} + \alpha_8 LnSALE_{it} + \alpha_9 CASH_{it} + \alpha_{10} LEVERAGE_{it} + \varepsilon_{it} \end{aligned} \tag{1}$$

where, *DIV* represents the dividend payout ratio; *CFR* represents the management ownership percentage; D_1 and D_2 are the dummy variables for management ownership. The Taiwan Stock Exchange defines major shareholders as those who own 10% or more. This paper infers that when management ownership exceeds 10%, managers are able to effectively control company decisions. The literature suggests that holdings over 20% can assure complete control over a company (La Porta et al., 1999; Faccio et al., 2001). This paper refers to Huang et al. (2012) by defining 10% and 20% as the non-linear cutoff points for management ownership. If management ownership falls below 10%, $D_1$is 0 (otherwise D_1 = 1). If management ownership exceeds 20%, D_2 is 1 (otherwise D_2= 0). The denotations α_1, (α_1 + α_2) and (α_1 + α_2 + α_3) represent the regression slopes of management ownership at 0~l0%, 10%~20% and above 20%, respectively. If the regression coefficients α_2 and α_3 are statistically significant, it means there is a non-monotonic linear relationship between management ownership and dividend payouts. If the regression coefficients α_5 and α_6 are statistically significant, it means managerial overconfidence can moderate the non-monotonic linear relationship between management ownership and dividend payouts. Moreover, growth opportunities (*GROWTH*), firm size (*LnSALE*), cash flow (*CASH*) and debt ratios (*LEVERAGE*) are control variables to control the influence of firm characteristics on dividend policies (Smith & Watts, 1992; Fama & French, 2001, 2002; Fenn & Liang, 2001;

Deshmukh et al., 2013). To take care of the pooling dataset in this paper, inferring to Petersen (2009), the t-values in the panel data regressions are adjusted by the clustered standard errors.

Table 3 indicates the net purchase (*PURCHASE*) as the proxy variable for managerial overconfidence. The analytical result in the first column in Table 3 shows the coefficients for *CFR*, $D_1(CFR - 0.1)$ and $D_2(CFR - 0.2)$, i.e. α_1, α_2 and α_3, are 0.062, -0.080 and 0.032, respectively. The t-values are 1.91, -1.92 and 1.89, respectively suggesting a non-monotonic linear relationship between dividend payout and management ownership. At low level of ownership, managers tend to pay out high dividends to mitigate the threat of being replaced and to win the support of external shareholders. When managers hold significant control rights and their positions are entrenched, they are motivated to seek their own interests and expropriate the wealth of the shareholders by lowering dividends. At high level of ownership, managers bear the idiosyncratic risks of a single company. In order to diversify investment risk, managers opt for high payouts so as to reallocate their own capital. It is worth noting that the coefficients of the interactive terms [$PURCHASE \times D_1(CFR - 0.1)$] and [$PURCHASE \times D_2(CFR - 0.2)$] of managerial overconfidence with net purchase (*PURCHASE*) and management ownership (*CFR*) are 0.035 and -0.040, respectively, and the t-values are 2.44 and -2.44. In other words, managerial overconfidence affects the relationship between management ownership and dividend payouts. The coefficient of growth opportunities (*GROWTH*) is -0.004, and the t-value is -2.53, indicating that high growth opportunities lead to more retained earnings and fewer dividend payouts. These findings are consistent with the existing literature (Fama & French, 2001; Fenn & Liang, 2001). Meanwhile, the coefficients of firm size (*LnSALE*) and cash flow (*CASH*) are 0.004 and 0.064, with the t-values of 4.56 and 2.87, respectively. This indicates the larger the firm size or the higher the cash flow, the stronger the tendency for high payouts. It is also consistent with past studies (Smith & Watts, 1992; Fama & French, 2001, 2002; Fenn & Liang, 2001). Finally, the coefficient of debt ratio (*LEVERAGE*) is -0.03, with a t-value of -6.25, indicating a negative correlation between debt ratios and dividend payouts and a consistency with existing literature (Fenn & Liang, 2001; Fama & French, 2002).

If the ownership by non-overconfident managers is 0~10%, the piecewise regression slope is 0.062 ($\alpha_1 = 0.062$). Once the ownership is higher than 0%, each 1% increase leads to an average increase in the dividend payout ratio by 0.062%. The piecewise regression slope for management ownership of 10%~20% is -0.018 [$\alpha_1 + \alpha_2 = 0.062 + (-0.08) = -0.018$], suggesting that an increase of 1% owned by non-overconfident managers results in a reduction of dividend payouts by 0.018%. The piecewise regression slope for overconfident managers with 10%~20% ownership is 0.017 [$\alpha_1 + \alpha_2 + \alpha_5 = 0.062 + (-0.08) + 0.035 = 0.017$], suggesting that 1% increase in overconfident managerial ownership leads to an increase of dividend payout by 0.017% instead of a reduction of 0.018%.

For non-overconfident managers who own over 20%, the piecewise regression slope is 0.014 [$\alpha_1 + \alpha_2 + \alpha_3 = 0.062 + (-0.08) + 0.032 = 0.014$], indicating a 0.014% rising dividend payout ratio with 1 % rising managerial ownership. In comparison, the piecewise regression slope for overconfident managers with more than 20% ownership is 0.009 [$\alpha_1 + \alpha_2 + \alpha_3 + \alpha_5 + \alpha_6 = 0.062 + (-0.08) + 0.032 + 0.035 + (-0.04) = 0.009$], indicating a 0.009% rising dividend payout ratio with 1% rising management ownership.

Table 3: Interaction between the Managerial Overconfidence (*PURCHASE*) and Management Ownership on Dividend Payout

	OLS Model Coefficient (t-value)	Tobit Model Coefficient (t-value)
Intercept	-0.047***	-0.102***
	(-2.71)	(-18.78)
CFR	0.062*	0.136***
	(1.91)	(7.36)
D_1 (*CFR - 0.1*)	-0.080*	-0.166***
	(-1.92)	(-6.16)
D_2 (*CFR - 0.2*)	0.032*	0.044***
	(1.89)	(3.21)
PURCHASE	0.001	0.000
	(0.64)	(0.17)
PURCHASE × D_1 (*CFR - 0.1*)	0.035**	0.057**
	(2.44)	(2.40)
PURCHASE × D_2 (*CFR - 0.2*)	-0.040**	-0.065**
	(-2.44)	(-2.20)
GROWTH	-0.004**	-0.017***
	(-2.53)	(-38.49)
LnSALE	0.004***	0.005***
	(4.56)	(21.43)
CASH	0.064***	0.344***
	(2.87)	(67.18)
LEVERAGE	-0.030***	-0.037***
	(-6.25)	(-16.67)
R^2(*Pseudo* R^2)	17.67%	30.02%
N	15,088	15,088

Note: This table reports the results for the piecewise OLS and Tobit regressions of dividend payout on management ownership and managerial overconfidence (*PURCHASE*), respectively. D_1 equals to one if *CFR* is greater than 0.1, zero otherwise. (*CFR - 0.1*) equals the *CFR* minus 0.1. D_2 equals to one if *CFR* is not less than 0.2, zero otherwise. (*CFR - 0.2*) equals the *CFR* minus 0.2. Other variables are defined in table 1. All t-values are based on two-tailed tests using clustered robust standard errors suggested by Petersen (2009). ***, ** and * represent the significance levels at 1%, 5% and 10%, respectively.
Data source: this research

The above results can be interpreted as follows. When non-overconfident managers own a 10%~20% ownership, their positions are entrenched. To pursue self-interests, managers may reduce dividend payouts and sacrifice shareholder benefits. In contrast, overconfident managers overestimate future cash flow and prospects, so the speed with which they reduce payouts is slower. In other words, overconfidence diminishes the adverse effects of managerial entrenchment on shareholders' benefits. At high level of management ownership, managers may prefer large dividend payouts to reallocate assets and diversify the risks of wealth concentration. However, overconfident managers choose to retain earnings to fund future investments because they overestimate their own ability and company prospects or even underestimate investment risks. Therefore, the dividend payout increase is slower for overconfident managers than for non-overconfident managers, even with high management ownership.

The second column in Table 3 shows the results of the Tobit regression analysis. The coefficients of *CFR*, $D_1(CFR - 0.1)$ and $D_2(CFR - 0.2)$ are 0.136, -0.166 and 0.044, respectively, with t-values of 7.36, -6.16 and 3.21. This proves the non-monotonic linear relationship between the dividend payout ratio and management ownership. Meanwhile, the coefficients of [$PURCHASE \times D_1(CFR - 0.1)$] and [$PURCHASE \times D_2(CFR - 0.2)$] are 0.057 and -0.065 and the t-values are 2.4 and -2.2, respectively. This indicates managerial overconfidence affects the relationship between management ownership and dividend payouts. The results of other control variables are consistent with the analysis shown in the first column.

Table 4 summarizes the analysis on capital expenditures (*CAPEX*) as the proxy variable for managerial overconfidence. The first column in Table 4 shows that the coefficients of *CFR*, $D_1(CFR - 0.1)$ and $D_2(CFR - 0.2)$ are 0.061, -0.088 and 0.043 and the t-values are 1.83, -2.2 and 2.78, respectively, indicating a non-monotonic linear relationship between management ownership and dividend payouts. The coefficient of managerial overconfidence (*CAPEX*) is -0.003, with a t-value of -1.77, suggesting a negative correlation between managerial overconfidence and dividend payouts. This is consistent with the results of past studies (Deshmukh et al., 2013). More importantly, the coefficients of the interactive terms [$CAPEX \times D_1(CFR - 0.1)$] and [$CAPEX \times D_2(CFR - 0.2)$]

between managerial overconfidence (*CAPEX*) and management ownership (*CFR*) are 0.033 and -0.038 and the t-values are 2.61 and-2.38, respectively. This indicates that managerial overconfidence affects the relationship between management ownership and dividend payouts.

The cutoff points in the piecewise regression for management ownership are set at 10% and 20%. The piecewise regression slope for 0~10% management ownership is 0.061 (α_1 = 0.061), indicating an average of a 0.061% increase in dividend payout ratio for each 1% increase in ownership. This means the dividend payout ratio for non-overconfident managers with less than 10% ownership will increase by 0.061% as managerial ownership increases by 1%. The piecewise regression slope is -0.027 [$\alpha_1 + \alpha_2$ = 0.061 + (-0.088) = -0.027] at 10~20% management ownership, suggesting a reduction of dividend payouts by 0.027% for firms without managerial overconfidence as managerial ownership increases by 1%. In comparison, the piecewise regression slope for firms with overconfident managers with a 10%~20% ownership is 0.006 [$\alpha_1 + \alpha_2 + \alpha_5$ = 0.061 + (-0.088) + 0.033 = 0.006], indicating dividend payout ratio increases by 0.006% instead decreases by 0.027% for 1% increase in managerial ownership. Once management ownership exceeds 10%, the reduction of the payout ratio for overconfident managers is 0.033% [-0.055% - (-0.088%) = 0.033%] lower than that for non-overconfident managers for each 1% increase in ownership. At 20% management ownership, managerial overconfidence can reduce the payout reductions by 0.33% (0.67% - 0.34% = 0.33%). The results are in line with the first column of Table 3.The piecewise regression slope is 0.014 [$\alpha_1 + \alpha_2 + \alpha_3$ = 0.061 + (-0.088) + 0.043 = 0.014] for firms without managerial overconfidence with higher than 20% ownership, indicating that payout ratios increase by 0.014% along with 1% increase in ownership. In contrast, the piecewise regression slope is 0.011 [$\alpha_1 + \alpha_2 + \alpha_3 + \alpha_5 + \alpha_6$ = 0.061 + (-0.088) + 0.043 + 0.033 + (-0.038) = 0.011] for overconfident managers with over 20% ownership, indicating that payout ratios increase by 0.011% along with 1% increase in ownership.

In the second column of Table 4, the Tobit regression analysis shows the coefficients of *CFR*, D_1(*CFR - 0.1*) and D_2(*CFR - 0.2*) are 0.131, -0.182 and 0.067, and that the t-values are 7.11, -6.55 and 4.09, respectively. This further proves the

non-monotonic linear relationship between dividend payouts and managerial ownership. Meanwhile, the coefficients of [$CAPEX \times D_1(CFR - 0.1)$] and [$CAPEX \times D_2(CFR - 0.2)$] are 0.068 and -0.077 and the t-values are 3.85 and -3.58, suggesting the moderation of managerial overconfidence on the relationship between management ownership and dividend payouts.

Table 5 refers to the integrated index for managerial overconfidence (*TOC*) as the proxy variable for managerial overconfidence. According to the first column of Table 5, the coefficients of *CFR*, $D_1(CFR - 0.1)$ and $D_2(CFR - 0.2)$ are 0.062, -0.082 and 0.035 and the t-values are 1.89, -2 and 2.13, respectively, indicating a non-monotonic linear relationship between management ownership and dividend payouts. More importantly, the coefficients of the interactive terms of [$TOC \times D_1(CFR - 0.1)$] and [$TOC \times D_2(CFR - 0.2)$] between managerial overconfidence (*TOC*) and management ownership (*CFR*) are 0.025 and -0.032, and the t-values are 1.70 and -2.46, respectively. This suggests the effect of managerial overconfidence on the non-monotonic linear relationship between management ownership and dividend payouts.

Table 4: Interaction between the Managerial Overconfidence (*CAPEX*) and Management Ownership on Dividend Payout

	OLS Model Coefficient (t-value)	Tobit Model Coefficient (t-value)
Intercept	-0.047*** (-2.70)	-0.102*** (-18.78)
CFR	0.061** (1.83)	0.131*** (7.11)
D_1 (*CFR - 0.1*)	-0.088** (-2.20)	-0.182*** (-6.55)
D_2 (*CFR - 0.2*)	0.043*** (2.78)	0.067*** (4.09)
CAPEX	-0.003* (-1.77)	-0.009*** (-7.60)
CAPEX × D_1 (*CFR - 0.1*)	0.033*** (2.61)	0.068*** (3.85)
CAPEX × D_2 (*CFR - 0.2*)	-0.038** (-2.38)	-0.077*** (-3.58)
GROWTH	-0.003** (-2.47)	-0.017*** (-38.60)
LnSALE	0.004*** (4.72)	0.005*** (22.21)
CASH	0.065*** (2.83)	0.351*** (67.67)
LEVERAGE	-0.030*** (-6.13)	-0.035*** (-16.00)
R^2(*Pseudo* R^2)	17.64%	30.48%
N	15,088	15,088

Note: This table reports the results for the piecewise OLS and Tobit regressions of dividend payout on management ownership and managerial overconfidence (*CAPEX*), respectively. D_1 equals to one if *CFR* is greater than 0.1, zero otherwise. (*CFR - 0.1*) equals the *CFR* minus 0.1. D_2 equals to one if *CFR* is not less than 0.2, zero otherwise. (*CFR - 0.2*) equals the *CFR* minus 0.2. Other variables are defined in table 1. All t-values are based on two-tailed tests using clustered robust standard errors suggested by Petersen (2009). ***, ** and * represent the significance levels at 1%, 5% and 10%, respectively.

Data sourse: this research

A further interpretation of the results shown in the first column of Table 5 is as follows. If ownership is less than 10%, the piecewise regression slope is 0.062 (α_1 = 0.062). The payout for non-overconfident managers with less than 10% ownership increases by 0.062% as ownership increases by 1%. At 10~20% non-overconfident management ownership, the piecewise regression slope is -0.02 [$\alpha_1 + \alpha_2$ = 0.062 + (-0.082) = -0.02]. Once non-overconfident managers own more than 10% and less than 20%, 1% increase in ownership leads to a reduction of payout ratios by 0.02%. In contrast, the piecewise regression slope is 0.005 [$\alpha_1 + \alpha_2 + \alpha_5$ = 0.062 + (-0.082) + 0.025 = 0.005] for overconfident managers with a 10%~20% ownership, indicating that 1% increase in ownership leads to an increase of payout ratios by 0.005%. The piecewise regression slope is 0.015 [$\alpha_1 + \alpha_2 + \alpha_3$ = 0.062 + (-0.082) + 0.035 = 0.015] for non-overconfident managers with more than 20% ownership. This indicates that dividend payouts increase by 0.015% each 1% increase in ownership. On the contrary, the piecewise regression slope is 0.008 [$\alpha_1 + \alpha_2 + \alpha_3 + \alpha_5 + \alpha_6$ = 0.062 + (-0.082) + 0.035 + 0.025 + (-0.032) = 0.008] for overconfident managers with over 20% ownership, indicating that dividend payout increases by 0.008% for each 1% increase in ownership for overconfident management ownership higher than 20%.

According to the Tobit regression analysis in the second column of Table 5, the coefficients of *CFR*, D_1(*CFR - 0.1*) and D_2(*CFR - 0.2*) are 0.131, -0.168 and 0.050, and the t-values are 7.20, -6.29 and 3.42, respectively. This further confirms the non-monotonic linear relationship between dividend payouts and management ownership. In addition, the coefficients of [$TOC \times D_1$(*CFR - 0.1*)] and [$TOC \times D_2$(*CFR - 0.2*)] are 0.039 and -0.042, and the t-values are 2.10 and -1.88, respectively, indicating the moderating effect of managerial overconfidence on the relationship between management ownership and dividend payouts.

This paper shows that when non-overconfident managers hold more than 10% ownership, they can effectively control company decisions. Managerial entrenchment leads to the motivation to embezzle the interests of shareholders by reducing dividend payouts. However, the speed of payout reductions for overconfident managers is lower than that for non-overconfident managers due to the behavior bias of overconfident managers who overestimate future cash flow

and investment project values. In other words, managerial overconfidence lessens the adverse effect of managerial entrenchment on the plundering of shareholders' wealth. At over 20% management ownership, non-overconfident managers become concerned with overconcentration of their personal wealth. As a result, they tend to seek high payouts to diversify their own investment risk. However, overconfident managers continue to retain earnings to fund future investments because they overestimate their own capability and investment project values or even underestimate investment risks. Even at a high level of management ownership, overconfident managers are less willing to opt for high payouts compared to non-overconfident managers. This paper refers to three different indicators as proxy for managerial overconfidence and applies OLS and the Tobit censored regression model for data analysis. The final conclusion is consistent and the empirical findings are valid, as there is no variance in empirical results due to differences in variables or model designs.

Table 5: Interaction between the Managerial Overconfidence (*TOC*) and Management Ownership on Dividend Payout

	OLS Model Coefficient (t-value)	Tobit Model Coefficient (t-value)
Intercept	-0.047***	-0.085***
	(-2.75)	(-15.84)
CFR	0.062*	0.131***
	(1.89)	(7.20)
D_1 (*CFR - 0.1*)	-0.082**	-0.168***
	(-2.00)	(-6.29)
D_2 (*CFR - 0.2*)	0.035**	0.050***
	(2.13)	(3.42)
TOC	-0.001	-0.002
	(-0.36)	(-1.47)
TOC × D_1 (*CFR - 0.1*)	0.025*	0.039**
	(1.70)	(2.10)
TOC × D_2 (*CFR - 0.2*)	-0.032**	-0.042*
	(-2.46)	(-1.88)
GROWTH	-0.004**	-0.020***
	(-2.50)	(-41.46)
LnSALE	0.004***	0.005***
	(4.66)	(19.90)
CASH	0.064***	0.335***
	(2.86)	(63.18)
LEVERAGE	-0.030***	-0.031***
	(-6.13)	(-13.60)
R^2(*Pseudo* R^2)	17.59%	25.67%
N	15,088	15,088

Note: This table reports the results for the piecewise OLS and Tobit regressions of dividend payout on management ownership and managerial overconfidence (*TOC*), respectively. D_1 equals to one if *CFR* is greater than 0.1, zero otherwise. (*CFR - 0.1*) equals the *CFR* minus 0.1. D_2 equals to one if *CFR* is not less than 0.2, zero otherwise. (*CFR - 0.2*) equals the *CFR* minus 0.2. Other variables are defined in table 1. All t-values are based on two-tailed tests using clustered robust standard errors suggested by Petersen (2009). ***, ** and * represent the significance levels at 1%, 5% and 10%, respectively.

Data source: this research

5. ROBUSTNESS TESTS

To further validate whether managerial overconfidence can moderate the non-monotonic linear relationship between management ownership and dividend payouts, this paper divides the sample into subgroups, depending on the presence of managerial overconfidence, in the construction of regression equation (2) with the same definitions as regression equation (1).

$$\begin{aligned} DIV_{it} = {} & \beta_0 + \beta_1 CFR_{it} + \beta_2 D_1(CFR_{it} - 0.1) + \beta_3 D_2(CFR_{it} - 0.2) + \beta_7 GROWTH_{it} \\ & + \beta_8 LnSALE_{it} + \beta_9 CASH_{it} + \beta_{10} LEVERAGE_{it} + \varepsilon_{it} \end{aligned} \tag{2}$$

Table 6 summarizes the analysis of the net purchase of shares (*PURCHASE*) as a proxy variable for managerial overconfidence in the examination of the effects of managerial overconfidence on the relationship between dividend payouts and managerial ownership. According to the first column of Table 6 concerning the sample of overconfident managers, the coefficient of *CFR is* 0.068, at the t-value is 1.67, and the coefficients of D_1 (*CFR - 0.1*) and D_2 (*CFR - 0.2*) are -0.063 and 0.002, respectively, which do not reach statistical significance. This suggests a positive correlation between management ownership and dividend payouts in the presence of managerial overconfidence. As the second column of Table 6 shows, the coefficients of *CFR*, D_1 (*CFR - 0.1*) and D_2 (*CFR - 0.2*) are 0.059, -0.075 and 0.029, and the t-values are 1.82, -1.79 and 1.76, respectively. These findings suggest a non-monotonic linear relationship between management ownership and dividend payouts in the absence of managerial overconfidence. At an ownership of less than 10%, non-overconfident managers tend to issue dividends so as to attract support from external shareholders. At an ownership of 10%~20%, managers have significant control and their positions are secured. As a result, they seek to reduce dividend payouts and sacrifice shareholder benefits. At an ownership higher than 20%, non-overconfident managers prefer large payouts in order to diversify their investment risks and reallocate their own capital. The analysis suggests a linear positive correlation between management ownership and dividend payouts in the presence of managerial overconfidence. However, the relationship is a non-monotonic linear one for non-overconfident managers. The Chow test with an F-

value of 10.62 indicates that there is significant variance in R^2, and thus confirms the effect of managerial overconfidence on the relationship between managerial ownership and dividend payouts.

Table 6: Relationship between Dividend Payout and Management Ownership by Managerial Overconfidence (*PURCHASE*)

	Model 1 *PURCHASE* = 1 Coefficient (t-value)	Model 2 *PURCHASE* = 0 Coefficient (t-value)
Intercept	-0.024 (-1.25)	-0.049*** (-2.93)
CFR	0.068* (1.67)	0.059* (1.82)
D_1 (*CFR - 0.1*)	-0.063 (-1.05)	-0.075* (-1.79)
D_2 (*CFR - 0.2*)	0.002 (0.06)	0.029* (1.76)
GROWTH	-0.007*** (-3.68)	-0.003** (-2.26)
LnSALE	0.003*** (3.30)	0.004*** (4.69)
CASH	0.105*** (3.97)	0.060*** (2.61)
LEVERAGE	-0.020*** (-3.13)	-0.031*** (-6.36)
R^2	20.82%	17.24%
N	2,257	12,831

Note: This table reports the results for the piecewise OLS regressions of dividend payout on management ownership by managerial overconfidence (*REPURCHASE*), respectively. D_1 equals to one if *CFR* is greater than 0.1, zero otherwise. (*CFR - 0.1*) equals the *CFR* minus 0.1. D_2 equals to one if *CFR* is not less than 0.2, zero otherwise. (*CFR - 0.2*) equals the *CFR* minus 0.2. Other variables are defined in table 1. All t-values are based on two-tailed tests using clustered robust standard errors suggested by Petersen (2009). ***, ** and * represent the significance levels at 1%, 5% and 10%, respectively.
Data source: this research

Table 7 refers to capital expenditures (*CAPEX*) as the variable for managerial overconfidence. The first column of Table 7 shows the coefficients of *CFR* and D_1 (*CFR - 0.1*) are 0.095 and -0.109, and that the t-values are 2.69 and -2.12, respectively. The coefficient of D_2 (*CFR - 0.2*) is 0.201, which does not reach statistical significance. According to the second column of Table 7 concerning the subgroup of non-overconfident managers, the coefficients of the variables *CFR*, D_1 (*CFR - 0.1*) and D_2 (*CFR - 0.2*) are 0.036, -0.049 and 0.029 and the t-values are 1.81, -1.93 and 2.51, respectively. In the presence of managerial overconfidence, there is a positive correlation between management ownership and dividend payouts when management ownership is below 10%. At a management ownership of 10%~20%, the relationship between management ownership and dividend payouts turns negative. It is worth noting that when management ownership exceeds 20%, overconfident managers opt for retained earnings to support future investments because they overestimate their own capabilities, company cash flow and investment valuations. Also, overconfident managers do not feel the urgency of issuing large dividend payouts to diversify their own investment risks. On the contrary, there is a non-monotonic linear relationship between management ownership and dividend payouts for non-overconfident managers, as they adjust dividend policies in accordance with their own stakes. In summary, overconfident managers do not adjust dividend policies in a timely manner due to behavior bias; whereas non-overconfident managers adjust dividend policies in accordance with their own holdings. The result of the Chow test indicates an F-value of 68.44 and rejects the null hypothesis, thus managerial overconfidence moderate the relationship between managerial ownership and dividend payouts.

Table 8 shows the analysis of the integrated index for managerial overconfidence (*TOC*). According to the first column in Table 8, the coefficient of *CFR* is 0.059, at the t-value is 1.73. The coefficients of D_1 (*CFR - 0.1*) and D_2 (*CFR - 0.2*) are -0.062 and 0.009, respectively, which do not reach statistical significance. This indicates a positive and linear correlation between the management ownership of overconfident managers and dividend payouts. This finding is consistent with the first column of Table 6. According to the second column of Table 8 concerning the subgroup of non-overconfident managers, the coefficients of *CFR*, D_1 (*CFR -*

0.1) and D_2 (*CFR - 0.2*) are 0.066, -0.086 and 0.035, and the t-values are 1.96, -2.04 and 2.09, respectively. This shows a non-monotonic linear relationship between dividend payouts and the ownership of non-overconfident managers. Overconfident managers do not adjust dividend policies due to personal behavior bias in the overestimation of their own capabilities, company cash flow and investment projects, or the underestimation of investment risks. In contrast, non-overconfident managers with ownership less than 10% tend to issue dividends so as to invite support from external shareholders. At 10~20% ownership, managers have a certain grip over company control. At this juncture, they opt for lower payouts for their own personal gain and at the expense of the shareholders' interest. If non-overconfident managers have holdings over 20%, they choose to pay high dividends in order to reallocate their own capital and diversify their investment risks. In conclusion, there is a linear relationship between dividend payouts and the holdings of overconfident managers and a non-monotonic linear relationship between dividend payouts and the holdings of non-overconfident managers. Finally, the Chow test on the two sub-groups indicates that F-value is 10.62 and rejects the null hypothesis, thus managerial overconfidence moderate the relationship between managerial ownership and dividend payouts.

Table 7: Relationship between Dividend Payout and Management Ownership by Managerial Overconfidence (*CAPEX*)

	Model 1 *CAPEX* = 1 Coefficient (t-value)	Model 2 *CAPEX* = 0 Coefficient (t-value)
Intercept	-0.022* (-1.72)	-0.062*** (-4.92)
CFR	0.095*** (2.69)	0.036* (1.81)
D_1 (*CFR - 0.1*)	-0.109** (-2.12)	-0.049* (-1.93)
D_2 (*CFR - 0.2*)	0.021 (0.97)	0.029** (2.51)
GROWTH	-0.008*** (-6.12)	-0.002* (-1.65)
LnSALE	0.002*** (3.93)	0.004*** (7.41)
CASH	0.141*** (7.00)	0.045** (2.30)
LEVERAGE	-0.022*** (-7.86)	-0.030 (-7.52)
R^2	26.76%	15.53%
N	7,089	7,999

Note: This table reports the results for the piecewise OLS regressions of dividend payout on management ownership by managerial overconfidence (*CAPEX*). D_1 equals to one if *CFR* is greater than 0.1, zero otherwise. (*CFR - 0.1*) equals the *CFR* minus 0.1. D_2 equals to one if *CFR* is not less than 0.2, zero otherwise. (*CFR - 0.2*) equals the *CFR* minus 0.2. Other variables are defined in table 1. All t-values are based on two-tailed tests using clustered robust standard errors suggested by Petersen (2009). ***, ** and * represent the significance levels at 1%, 5% and 10%, respectively.
Data source: this research

Table 8: Relationship between Dividend Payout and Management Ownership by Managerial Overconfidence (*TOC*)

	Model 1 *TOC* = 1 Coefficient (t-value)	Model 2 *TOC* = 0 Coefficient (t-value)
Intercept	-0.016 (-1.22)	-0.059*** (-3.38)
CFR	0.059* (1.73)	0.066** (1.96)
D_1 (*CFR - 0.1*)	-0.062 (-1.48)	-0.086** (-2.04)
D_2 (*CFR - 0.2*)	0.009 (0.57)	0.035** (2.09)
GROWTH	-0.008*** (-5.37)	-0.003** (-2.42)
LnSALE	0.002*** (3.48)	0.004*** (5.23)
CASH	0.155*** (10.81)	0.053*** (52.55)
LEVERAGE	-0.019*** (-3.51)	-0.032*** (-6.03)
R^2	23.28%	17.75%
N	4,716	10,372

Note: This table reports the results for the piecewise OLS regressions of dividend payout on management ownership by managerial overconfidence (*TOC*). D_1 equals to one if *CFR* is greater than 0.1, zero otherwise. (*CFR - 0.1*) equals the *CFR* minus 0.1. D_2 equals to one if *CFR* is not less than 0.2, zero otherwise. (*CFR - 0.2*) equals the *CFR* minus 0.2. Other variables are defined in table 1. All t-values are based on two-tailed tests using clustered robust standard errors suggested by Petersen (2009). ***, ** and * represent the significance levels at 1%, 5% and 10%, respectively.
Data source: this research

6. CONCLUSIONS

This paper examines whether the relationship between management ownership and dividend policies is affected by managerial overconfidence. The empirical results suggest a non-monotonic linear relationship between management ownership and dividend payouts among the listed firms in Taiwan. If management ownership is low, the managers do not have sufficient control and their positions are threatened. To win the support of external shareholders and to pursue maximization of their personal wealth, managers prefer dividend payouts to retained earnings. If management ownership exceeds 10%, managers become motivated to expropriate the interests of external shareholders, as they feel secure in their positions and their control over company decisions. Therefore, managers prefer retained earnings in order to pursue personal gains, rather than dividend payouts, and there is a negative correlation between management ownership and dividend payouts. Finally, if managers have high stakes, their investments will be highly concentrated in a single company. To reallocate their own assets and diversify investment risks, managers tend to pay out large dividends. At this juncture, the correlation between management ownership and dividend payouts turns positive again.

More importantly, this paper finds the relationship between management ownership and dividend policies depends on the presence of managerial overconfidence. In other words, managerial overconfidence affects the non-monotonic linear relationship between these two. Overconfident managers overestimate future cash flow and prospects, so their motivation to plunder the interests of shareholders is mitigated, despite their ownership being sufficient to ensure effective control. Managerial overconfidence slows down the rate of dividend reductions. Put differently, managerial overconfidence lessens the adverse effects of entrenchment on shareholder wealth. Although managers with large stakes may seek high payouts to diversify their own investment risks, overconfident managers continue to retain earnings to fund future investments, due to their overestimation in their own value-creation capabilities and the value of investment projects and underestimation of investment risks. Therefore,

overconfident managers exhibit a slower pace in dividend payout increases compared to non-overconfident managers, despite high ownership. Finally, this paper proves that managerial overconfidence affects the non-linear relationship between management ownership and dividend payouts and mitigates the adverse impacts on managerial entrenchment on shareholders' wealth.

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