

Thesis for MSc in Finance

Research on How Managerial Overconfidence Impacts

Cash Dividends Policy

Case of the U.S. market



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Abstract

The main purpose of this thesis is to statistically analyze the impact of managerial overconfidence on cash dividends policy via fifty U.S. selected case firms during year 2008 to 2017. Intuition behind this is to take a closer look at and potentially detail the neoclassical MM dividends irrelevance policy, also to additionally take organizational behavior into consideration.

In spite the fact that most dividend payout could be explained by classical theories of dividend distribution policy, quite a number of decisions on dividend payout, such as dividends paid are sometimes even lower than bank interests, are way too complicated to account for. This has much to do with the reality against the “rational economic man” assumption, as behaviour pattern of overconfident managers reveals the tendency for them to overestimate the value of investments’ cash flows and underestimate the risk they may bring in meanwhile, thus financially support too many investment projects with net present value below zero.

To do such research on how managerial overconfidence impacts dividends policy helps make up for long existing problems of unexplained phenomenon on cash dividend payout and furthermore abnormally fluctuating stocks markets. In addition, the research contributes to setting relevant policies on distribution of resources more rationally for individual firms.

Keywords: *overconfidence, cash dividends, Tobit model, Logistics model, options*

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1 Introduction

1.1 Background

Traditional financial theory focuses on effective market, containing two main premise assumptions, rational economic man and effective arbitrage assumption. Rational economic man refers to assumptions that all participants in capital market are rational, capable to make rational decisions maximizing their individual benefits without getting disturbed by irrational elements such as self emotions. While effective arbitrage assumption claims that arbitrage in the market does not carry any cost or risk and is able to eliminate existing differences in capital market, keeping capital price and its internal value at the same level, which makes up effective market theory, starting point of dividend policy in the early stage.

Research on the subject deepened, traditional dividend theories failed to convincingly account for some certain abnormality on dividend in capital market. For instance, in 1990s financial researchers found out about the phenomenon called “disappearing dividends” where proportion of listing companies giving out cash dividend tends to decrease in western countries including Sweden (Fama & French, 2001), conflicting with traditional dividend theories where corporations are supposed to pay dividends in cash as much as possible since it helps lower agency cost and convey the positive expectations from managers maintaining decent functioning.

Roll (1986) put forward hubris hypothesis that hubris gives rise to unnecessary acquisition not in favor of benefits of shareholders. Over optimism, overconfidence or of such behavioral traits of CEOs could drift investment policy from optimal option (Malendier & Tate, 2005a), which casts light on agency cost (Jensen & Meckling, 1976) as separation of property ownership from franchise, one of the most outstanding features of contemporary corporations. Principal-agent theory is based on the relation of principal and agent side thriving from information asymmetry. Principal-agent relation mostly takes place between shareholders and managers or creditors, where principal side guarantees agent side rather influencing power on decision making while principals find it hard to keep track of agents, which is exactly making principal-agent relation different from any other employer-employee relation.

Rozeff (1982), La Porta et al. (2000) and DeAngelo et al. (2004) are a few researchers claiming that dividend policy is quite useful when it comes to reducing agency conflicts and therefore agency costs. Caelers (2010) testified a significant correlation between dividend payout and agency cost even though outcomes are sensitive to different independent variables. It still remains unclear what kind of impact managerial overconfidence has over dividend policy.

From what is introduced above, it appears necessary to cultivate new theories to sufficiently explain abnormal realistic financial decisions in addition to traditional MM neoclassical theories. Exemplified by Hill(2012)

as well as Koenigs and Tranel(2007), plenty of psychological research revealed the absence of rational economic man assumption. Idiographic characteristics including but not limited to emotions and preferences would have impact on human recognition, causing various recognition difference and irrational behavior. Similarly, participants of the market would react differently in the process of making decisions under either direct or indirect influence of irrational elements, boosting introduction of psychological elements to study in the financial field. The behavioral finance, to some extent, explained the reasons behind the phenomenon of bubbles and panics (Dufwenberg *et al.*, 2005). Equity premium puzzle, that investors can be unwilling to hold the assets with high average return, is also a case behavioral finance is trying to solve (Barberis *et al.*, 2003).

De Bondt and Thaler (1996) carried out research on overconfident behavior applying relevant psychological principles, drawing conclusions that overconfidence might be the most common irrational behavior during decision making session. Alas Geol and Thakor (2008) pointed out it is rather common for corporation managers to behave overconfidently, influencing greatly on financial decision making.

Although researchers have been doing research on impact of managerial overconfidence on investment or merging and acquisition decisions (Malmendier & Tate, 2005a, 2005b; Gervais, 2003), there are always few papers discussing relationship between overconfidence and dividend, let

alone those discussing relationship between overconfidence and specifically cash dividend.

Relation between cash dividend and top manager being overconfident can be testified based on multiple theories. From the view of agency cost, Caelers (2010) disclosed that dividend policy is indeed affected by managerial overconfidence but the way it works still remains unclear. While Ben-David, Graham and Harve (2007) claimed internal funding would be the priority choice of firms because of existence of information asymmetry and trading costs. So overconfident managers would prefer to hold cash in the firm and pay as little cash dividend as possible when they have to. Meanwhile, Deshmukh, Goel, Howe (2008), and Codeiro (2009) went further down the research on this subject and revealed that managerial overconfidence would lead to the firm cutting down on paying off cash dividend.

Under traditional finance theory, Miller and Modigliani (1961) suggested that the dividend policy is irrelevant in an ideal economic environment where the investors pay little attention to the amount of dividends payment. However, in the realistic market with imperfection, the existence of issues such as flotation cost and information asymmetry have provoked demand of close attention paid by investors towards dividends policy, which can also be regarded as the theoretical basis of this paper.

1.2 Purpose and Expectation

1.2.1 Purpose of the Research

Inspired by the necessity of taking psychology into consideration in the research field of behavioral finance, the purpose of carrying out the research is to figure out whether firm managers being overconfident has any impact on cash dividend payout and if so, in which dimension and how much it does.

1.2.2 Previewed Results

The expected goal to reach is to quantify this certain psychological element of overconfidence in financial decision making so as to more efficiently run the company. Previewed results are the coefficients of overconfidence variable, whose positivity or negativity determine in which way overconfidence is going to affect cash dividend payout, if significant.

1.3 Contributions and Drawbacks of the Thesis

1.3.1 Contributions of the Research

From the perspective of practical use, sample of objective data, that of fifty listing American firms over the time period 2008-2017 is used to empirically testify whether overconfidence of managers in listing companies have positive, negative or neglectable impact on dividend policy, which would be

considerably beneficial in the field of financial operation. Besides, relevant findings could greatly help improve operating efficiency and corporation performance.

From the perspective of methodology, a quantified method is applied to measure overconfidence. Previous literatures utilized overconfidence as a dummy variable with a binary conclusion of a CEO being either overconfident or not, where the threshold may be vague. In this thesis, instead of arbitrarily applying the method used by Malmendier and Tate (2005a), we decide to quantify the level of overconfidence as concrete numbers so as to hopefully narrow down, even completely eliminate this noise. Ordinary least square and Logistic binary models are applied for seeking the relation between overconfidence and willingness to pay, while Tobit model is also introduced for testifying the relation between overconfidence and the amount managers tend to pay if they do.

1.3.2 Drawbacks of the Research

Speaking of drawbacks of the thesis, it only targets at what sort of impact managerial overconfidence, an irrational psychological behavior would have on dividend policy without taking potential different influence caused by current political and economic situation. During recession, overconfident irrational managers would tend to keep holding firm options; In the case of a listing company, signaling theory (Spence, 1973) points out that dividend is used as a signal to investors that the firm is functioning normally and

performing quite well in order to attract more inflows when financing, thus cash dividend would also be affected by investors.

The simplification of previous method is one of the most creative point of this thesis but also could be seen as a drawback that it is derived from one of existing measurements. Logical may it sound, the idea has never been in practice before thus is need of some practical application as support.

1.4 Outline of the Thesis

The first chapter introduces background of the thesis and previous research on the topic and came up with the research question, the uncertain relation between managerial overconfidence and cash dividend. Contribution and drawbacks of the thesis are mentioned.

The second chapter is theoretical frameworks, defining overconfidence and its measurement, and explaining potential impact of it on firms, briefly summarizing review of dividend theories. Two hypotheses are thus made based on previous literature.

In the third chapter, the thesis attempts to mathematically testify the relation between overconfidence and cash dividend payout. Two formulas are correspondingly built based on willingness to pay and amount to pay

afterwards. Empirical results are attained and analyzed through correlation analysis and regressions.

The fourth chapter ends with conclusions and probable improvements.

2 Theoretical frameworks

2.1 Dividend Theories

In the 1960s and 1970s, scholars mostly paid attention to whether dividend policies would affect stock price. The most representative ones among dividend theories are one bird at hand, MM dividend irrelevance and tax difference theory, consisting of traditional dividend theory.

Dividend irrelevance theory insists that price of firm stocks has nothing to do with how dividend is allocated but merely depends on profitability and risk level of firm investment (Miller & Modigliani, 1961). Strict as dividend irrelevance theory is, scholars made adjustments to assumptions significantly unmatching reality, developing derivative theories including different corporate and personal tax treatments (Farrar & Selwyn, 1967), clientele effect theory (Miller & Modigliani, 1961), signaling theory (Spence, 1973), agency costs theory (Jensen & Meckling, 1976), etc. These dividend theories managed to give out relatively reasonable explanation on perspectives on motivations, weaknesses and strengths of firms giving out cash dividends.

Signaling theory drifts apart from MM dividend theory by depriving the assumption that investors and managers share the same information and claiming existence of information asymmetry. As dividend is a means of conveying the information from insiders to shareholders, it is also

implication of the firm profitability in the future, thus to some extent has consequent effect on firm's stock price. Stock price is supposed to move in the same direction with the amount of the firm's cash dividend payout.

Behavioral theory has thrived since the 1990s, when Baker and Wurgler pointed out investors tend to have high demand on stocks from who pay out dividends, giving rise to the so-called dividend premium. This cannot be well explained by traditional dividend theories since only the demand side is considered and the supply side is totally overlooked. They testified such theory by examining listing company data from 1962 to 2000 and concluded that managers in listing companies have a tendency to pay out dividend when dividend premium is positive, vice versa (Baker & Wurgler, 2004a). For the relation between fluctuation of willingness of listing companies to pay out dividends and dividend premium is examined with data from 1962 to 1999, when Baker and Wurgler (2004b) found out that listing companies are more willing to pay out dividends for positive dividend premium and similarly, less willing to pay out dividends for negative dividend premium.

2.2 Definition of Overconfidence

As to defining overconfidence, there are multiple different definitions depending on corresponding perspectives. In view of psychology, overconfidence is deemed as sort of cognitive bias. Presson and Benassi (1996) defined overconfidence as overestimation of an individual for its mastered knowledge, capability to take charge, odds to succeed and such.

From view of management, Landier, Thesmar (2003) and Campbell (2007) defined the concept of managerial overconfidence as managers' psychological bias to overestimate profits and underestimate risk, while Gervais, Heaton and Odean (2003) defined it as managers overestimate the odds for success and payoff of investment projects.

Generally, previous studies defined overconfidence as overestimation for future profits and underestimation for potential risk due to overestimation for individual judgement and ability to keep control (Cooper et al., 1988; Goel & Thakor, 2008; Landier & Thesmar, 2009). Thus the thesis would define overconfidence as overestimation for unrealized coming profits arising from overestimation for self-capability for decision making and being in charge.

2.3 Occurrence of Overconfidence

When it comes to why overconfidence occurs, it might be over optimism, self-attribution bias or better than average effect. Over optimism refers to it when people tend to put more money on positive rather than negative outcome predicting how things evolve. Kunda (1987) found out that chance people expecting positive incidents on themselves is bigger than that of people expecting the same on others, and that people even bear explicitly unrealistic optimism on stochastic events, which could help people handle all kinds of obstacles in real life much easier. But too much illusion would lead to cognitive bias and make people blindly confident towards what lies

ahead in the future thus fail to make the right choice and accurate judgements.

Self-attribution bias refers to it when individuals tend to commit success to their certain internal characteristic and failure to stochastic or external elements (Wolosin et al., 1973). For managers in firms particularly, executive officers with self-attribution bias issues would attribute normal functioning and excellent performance of the firm to themselves but poorly maintained condition to bad fortune or economy recession. Meanwhile, Fiske and Taylor (1978) found that people stress more on self-enhancing attribution after success and forget about self-attribution after failures with certain preference, strengthening their overconfidence one step further.

In terms of better than average effect, Taylor and Brown (1988) pointed out that people own better sense over their own positive characters than over those of their partners. It can also be interpreted as individuals in possession of more integrated assessment over self-capabilities and performance while they are more likely to generate those of others based on conjecture, boosting overconfidence from lower positioning towards others. In scenario of university teaching, Cross (1977) came up with questionnaire distributed at University of Nebraska, where 94% of teaching staff appeared to rate their teaching abilities over average level and 68% even considered themselves among top quarter. Similarly, Malmendier and Tate (2005b) claimed this effect takes place among core CEOs or high positioned executives more frequently since CEOs are convinced of their

better judgements on investment or acquisition and merging making than ordinary managers. What intensifies the effect is that CEOs lack individuals as control group (Moore & Kim, 2003).

2.4 Overconfidence Measures

Efficient measurements of whether managers are overconfident has always been one of barriers on this subject. Over the past few decades, following major measurements on overconfidence have been put forward with different variables.

First off, content of overconfidence can be estimated through stock options and stock holding, originated by Malmendier and Tate (2005a). In this dimension they came up with three methods of measuring overconfidence of CEOs. First work on the proportion of insiders holding in-the-money options within five years, then compare that to the standard proportion, which is 67%. If the proportion calculated exceeds the standard and insiders did not lower this proportion by exercising options at least twice then such insider is considered as overconfident. If CEOs held their options till one year before expiration date without exercising then considered overconfident. Alternatively, if a CEO ever net bought firm stocks within first five years in the sample period then he is claimed to be overconfident. Among methods mentioned, the second one has been worldwide used in relevant studies (Malmendier, U. & Tate, G., 2005b; Cordeiro, 2009; Deshmukh *et al.*,2013). One of the advantages of their measurement is that data is more accessible and more widely recognized and applied, while a

certain percentage has to be set ahead as threshold to distinguish whether overconfidence exists.

Earning forecast deviation method was earliest introduced by Lin, Hu and Chen (2005), suggesting extent of self confidence of managers could be measured by the deviation of earning forecast and actual earnings of the firm. Comparing what managers forecast based on firm performance in the first three seasons and actual annual revenue, if forecast earnings overruns actual amount, then such managers are defined as overconfident ones. This method is more comprehensive, making corresponding conclusions more direct. However, it is limited by the availability of forecast earnings.

Another substitute measurement is based on perception of outsiders, mainly press such as The New York Times, Business Week, Financial Times, The Economist and The Wall Street Journal (Malmendier & Tate, 2005b). Key words indicating CEO personalities or characteristic features are counted as sign of overconfidence, including but not limited to confident, optimistic, reliable, cautious, conservative, practical, frugal and steady. This method is yet not applicable since it is almost impossible to cover all the press, besides it remains debatable about key words to be searched since it is rather likely that real situation is revealed rather than mere exaggeration towards managerial competence.

Comparing pros and cons of methods above, we decided to simplify the first method where Malmendier and Tate (2005a) focused on testing if

CEOs long hold firm options with high expectations for performance in coming periods. We simplified the methodology by dividing unexercised options at the end of year by options held altogether in the same period. This very proportion would work as an indicator of willingness of a manager to exercise options he possesses. Turning overconfidence into a random variable fluctuating between 0 and 1 makes it easier to measure overconfidence quantitatively.

From previous literature, there are basically three main perspectives towards the relation between overconfidence and cash dividend policy. Scholars overall approved that the willingness of dividend payout decreases as the level of overconfidence decreases. Deshmukh, Goel, Howe (2008), and Codeiro (2009) claimed that the amount of cash dividend payout is affected in the same direction with level of overconfidence, while Wrońska-Bukalska (2018) held the opposite view. Other researchers believed the relation remains vague since the direction of impact changes by different variables, as can be exemplified by Caeler (2010).

2.5 Assumptions and Hypothesis

Previous literature pointed out relations between overconfidence and cash dividend policy, among which majority concluded that overconfidence would lead to firms being less willing to pay out cash dividend and cutting down cost of cash dividend even if they do.

For clarification, overconfidence is defined as overestimation of a firm's ability to identify profitable investments, and such firm would prefer to keep cash within the firm so as to support internal funding.

Based on assumptions above, we set two hypotheses as follows:

Hypothesis 1: Compared to firms free of managerial overconfidence, firms with managerial overconfidence are less willing to pay out cash dividend.

Hypothesis 2: Compared to firms free of managerial overconfidence, firms with managerial overconfidence tend to pay out cash dividend of less amount if they do.

3 Empirical Test and Analysis

3.1 Sample and Data Collection

In seek of a relatively stable market in recent years with practically accessible data, top 50 listing US companies with most revenue are selected as research sample, with a decade period between year 2008 and 2017. Logic behind the period selection is that we intend to account for firms not only at their developing stage but also the prosper stage to avoid potential errors arising from different stages those sample corporations are currently at.

The sample needs to be filtered and excluded based on the specific need in this case. First off, it is obvious that firms with insufficient data during the decade are left out since lack of data accuracy would cause continuous errors in the tests. Moreover, firms in financial industry are also excluded as their accounting principles, capital structure, financial characteristics significantly differ from those of other industries, fourteen firms are thus excluded from top fifty listing companies.

Data in the sample mainly stems from database of MacroTrends and ExecuComp, among which values representing managerial overconfidence is intuitively the proportion of sum of unexercised options by the end of last year to the amount of total granted options, attained by manual calculation.

Excel and Eviews are in use for data process, descriptive statistics, correlation analysis and regression model.

3.2 Empirical Model and Variables

3.2.1 Empirical model

The paper carries out research on the impact of managerial overconfidence on dividend policy from the dimensions of firms' tendency to pay the dividends and the level of payout if they do. Targeting at hypothesis 1, Logistic model is applied as follows since there are only two possible outcomes of whether firms are willing to pay cash dividends or not, making their willingness a binary variable.

$$Div_{it} = \alpha_0 + \alpha_1 oconf_{it} + \alpha_2 roe_{it} + \alpha_3 fcps_{it} + \alpha_4 lev_{it} + \alpha_5 size_{it} + \alpha_6 growth_{it} + \beta_t year_t + \gamma_j ind_j + \mu_{it}$$

Targeting at hypothesis 2, Tobit model as well as an OLS regression is applied since the amount of cash dividend paid by firms cannot be less than zero, making it a truncated dependent variable. The applied regression is as follows.

$$DpS_{it} = \alpha_0 + \alpha_1 oconf_{it} + \alpha_2 roe_{it} + \alpha_3 fcps_{it} + \alpha_4 lev_{it} + \alpha_5 size_{it} + \alpha_6 growth_{it} + \beta_t year_t + \gamma_j ind_j + \mu_{it}$$

3.2.2 Explanation on Variables

For control variables, since dividend payout would be affected by firm performance, capital structure and such, the paper set following variables after taking previous papers into consideration:

- ROE, short for return on equity as substitute variable for firm's ability to gain profit and shareholder value, is equal to net profit divided by equity.
- FCPS equals free cash flow to firms divided by number of shares.
- LEV is firm leverage, equal to total debt divided by total assets at the end of the year.
- Firm size is measured as natural logarithm of current operating revenues of the current year.
- Growth rate is attained as annual growth rate of total assets.
- Eleven dummy variables of industries can be extracted from data on industries excluding banking or other financial services on north American market.
- Year has nine dummy variables since the paper focuses on data between year 2008 to 2017.

For dependent variables to be explained, in Logistic model, Div works as a dummy variable indicating the tendency for a firm to pay out cash dividend. When a firm pays out cash dividend, it obviously has tendency to pay dividend in cash, thus we take 1, otherwise 0. DpS is a non-negative

variable in the Tobit regression representing the ability of a firm to pay out cash dividend, or cash dividend paid per share.

For independent explaining variables, oconf is expressed as the proportion of unexercised options at the end of current year in the total options held by executives. If an individual chooses not to exercise any option in the current year, it is considered overconfidence and value of oconf is 1. If an individual chooses to exercise part of its options granted, oconf would turn out a number between 0 and 1. The bigger oconf is, the more overconfident the individual is. Quantification of overconfidence helps wipe out potential error setting a threshold ahead to detect any sign of overconfidence. Problem data of oconf is any value bigger than 1, supposed to be removed.

We have winsorized variables ROE, FCPS, LEV and GROWTH RATE all at 5% percentiles, and excluded negative leverage and firm size out of reasonable consideration.

3.3 Descriptive Statistics and Correlation Analysis

3.3.1 Descriptive Statistics

In gesture to thoroughly know about the distribution of variables and their relative characteristics, descriptive statistics are shown in table 1.

Panel A. Firm Characteristics

Characteristics	No. of Obs.	Mean	Median	Maximum	Minimum	Std. Dev.
DpS	499	1.418038	1.100000	111.4000	0	1.355542
overconfidence	378	0.728122	0.79	0.99	0.03	0.213667
return on equity	545	22.63041	16.7612	574.9789	-12.35823	23.96270
free cash flow per share	548	4.551369	3.67845	13.40492	0.260220	3.471663
leverage	538	0.436055	0.375936	0.985916	0.101866	0.239100
size	550	11.20573	11.18605	13.12305	8.121039	0.747104
growth rate	545	0.065636	0.046411	0.331018	-0.079632	0.101953

Panel B. Industry Distribution regarding overconfidence

Industry	No. of Obs.	Minimum	Maximum	Average
All	378	0.03	0.99	0.7281
Aerospace	16	0.2	0.96	0.725
Auto/Tires/Trucks	11	0.25	0.99	0.7173
Computer and Technology	68	0.13	0.98	0.6766
Construction	6	0.42	0.99	0.7917
Consumer Discretionary	19	0.49	0.95	0.7832
Consumer Staples	34	0.37	0.98	0.7326
Industrial Products	9	0.61	0.95	0.8333
Medical	90	0.05	0.99	0.7284
Multi-Sector Conglomerates	18	0.34	0.98	0.7539
Oils/Energy	25	0.04	0.98	0.78
Retail/Wholesale	65	0.03	0.99	0.7017

Transportation	17	0.35	0.96	0.7912
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Table 1 Data Characteristics and Distribution

In table 1, panel A briefly presents characteristics of sample firms. It can be seen that average value of managerial overconfidence is 0.728122, median is 0.79, which means oconf value at relatively low level should be excluded from samples of overconfidence. Average value of ROE is 22.63041, and most growth rate are positive, indicating profitability of objects we intend to do research on, proving our research worthy.

Panel B reveals distribution of overconfidence in different industries. Data collected points out the industry industrial product has the highest level of average overconfidence as 0.8333. Those of the construction and transportation industries are also relatively high, slightly exceeding medium. Considering the three industries do not have large samples, overconfident managers are mostly distributed in these three industries. While computer and technology industry has the lowest overconfident level as 0.6766.

3.3.2 Correlation Analysis

Before applying data to regression analysis, the paper carried out correlation analysis to sample variables so as to detect potential existence of multicollinearity. Since if two or over variables share the same changing trend, estimated deviation of regression parameters might increase, decreasing t-value of some certain variables and lowering their significance

level, thus would lead to entirely inaccurate conclusions. Therefore, the paper examines whether multicollinearity exists among variables with aid of correlation coefficient matrix of those variables, and results are shown as below.

	DpS	DIV	OCONF	ROE	FCPS	LEV	SIZE	GROWTH
DpS	1.000000							
DIV	0.378972	1.000000						
OCONF	-0.058895	-0.072427	1.000000					
ROE	0.505228	0.154149	-0.066990	1.000000				
FCPS	0.425124	-0.037344	-0.081438	0.326834	1.000000			
LEV	0.272158	-0.058960	0.054813	0.392437	0.189360	1.000000		
SIZE	0.232114	0.433069	-0.073789	0.087877	0.139749	0.071603	1.000000	
GROWTH	-0.122854	-0.191827	-0.011149	-0.000375	0.071374	-0.137993	-0.092951	1.000000

Table 2 Correlation Coefficients

Table 2 reveals Pearson correlation coefficient matrix of all variables. As can be seen, Pearson coefficient between managerial overconfidence and willingness to pay out dividend is -0.058895, which means they are negative correlated, and that overconfident managers tend not to pay out cash dividend. The correlation between the amount to pay and overconfident is also negative with the value of -0.072427, which lives up to our expectation. Besides all correlation coefficients between variables are all below 0.7, ruling out the possibility of multicollinearity.

In controlling variables, roe, fcps, lev and size are all positively correlated to dps, while coefficients of fcps and willingness to pay, lev and willingness to pay are both negative, -0.03734 and -0.05896, conflicting with the research

expectation. Besides, growth rate and dividend paid out are negatively correlated. It is consistent with logic that firms pay less dividend to hold cash within firms to supply sufficient funding for investments and potential further growth. As to the detailed relationship between dependent variable and independent variables, further regression test is required.

3.4 Empirical Results

3.4.1 Analysis on managerial overconfidence and willingness to pay

Last section carried out descriptive statistics and correlation analysis on variables, then we will move on to regression test in seek of potential impact of managerial overconfidence on willingness to pay out cash dividend and perhaps limit to payment. In hypothesis 1, since dependent variable Div, willingness to pay out cash dividend, controlling variables ind and year are all dummy variables, values set as either 0 or 1, binary Logistic model is applied for regression test to test hypothesis 1. Results of the Logistic model regression are shown as table 3 below.

Variable	Coefficient	Std. Error	z-Statistic	Prob.
FCPS	-0.180898	0.088077	-2.053870	0.0400**
GROWTH	-5.292628	2.668677	-1.983241	0.0473**
LEV	-3.521453	1.249608	-2.818047	0.0048***
OCONF	-7.936025	4.557974	-1.741130	0.0817*
2008	-2.617519	1.802594	-1.452085	0.1465
2009	-1.949781	1.717224	-1.135426	0.2562
2010	-2.576993	1.686437	-1.528069	0.1265
2011	-2.482025	1.806147	-1.374210	0.1694
2012	-0.819072	1.896385	-0.431912	0.6658
2013	-1.768463	1.748076	-1.011663	0.3117

2014	-1.392765	1.981705	-0.702811	0.4822
2015	-0.458810	1.798932	-0.255046	0.7987
2016	-0.420956	1.883583	-0.223487	0.8232
ROE	0.024223	0.013140	1.843432	0.0653*
SIZE	2.156950	0.471219	4.577384	0.0000***
Intercept	-10.07679	6.060192	-1.662784	0.0964*
McFadden R-squared	0.439782	Mean dependent var		0.889868
S.D. dependent var	0.313746	S.E. of regression		0.237945
N	227			

Significant at * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3 Logistic regression

Table 3 is in correspond with Logistic model. According to the average value of oconf in results from regression, when overconfidence is defined as $oconf > 0.7$ it fits the regression best. In fact it is logical since holding small proportion of company options merely as a reflection of good corporation performance cannot be considered as overconfidence. The coefficient of managerial overconfidence is significantly negative at the level of 10%, implying that the more overconfident managers are, the less willing they are to pay out cash dividend, which is consistent with theoretical analysis before. It should also be noticed that the average of the dependent variable is as high as 0.89, which represents that most firms are tending to pay cash dividends to shareholders. the Hypothesis 1 is testified by Logistic model. To be noted, industry is not taken as dummy variable because of quasi-complete separation arising from relatively small sample firms and that industries determine the value of dividend variable beforehand.

However, due to the reason that Logistic model is not able to take fixed effect into consideration, which is rather concerning since unobserved heterogeneity should be considered in firm level data, an OLS regression model is also applied to make up, where industry level is controlled as dummy variable. The thesis uses both period fixed effect and cross-section fixed effect to quantify firm-specific characteristics and impact of year on data, shown as table 4.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OCONF	-0.484664	0.166942	-2.903186	0.0042***
FCPS	-0.003835	0.006595	-0.581414	0.5617
GROWTH	0.069997	0.143700	0.487102	0.6268
LEV	-0.068388	0.167371	-0.408602	0.6834
ROE	-0.001857	0.000849	-2.185860	0.0302**
SIZE	0.006913	0.078407	0.088164	0.9299
Intercept	1.314662	0.871138	1.509131	0.1332
R-squared	0.798506	Mean dependent var		0.889868
Adjusted R-squared	0.725676	S.D. dependent var		0.313746
N			227	

Significant at * p < 0.10, ** p < 0.05, *** p < 0.01

Table 4 OLS regression for Hypothesis 1

Similarly, table 4 reveals the negative correlation between overconfidence and willingness to pay, but the relation is even significant on the level of 1%. Through two models, the correlations between overconfidence and willingness to pay both turn out to be significant on the level of at least 10%. Therefore, hypothesis 1, firms with managerial overconfidence are less willing to pay out cash dividend, is testified in two different ways.

	Value	df	Probability
Likelihood ratio	7614.343	46	0.0000***

Significant at * p < 0.10, ** p < 0.05, *** p < 0.01

Table 5 Panel Cross-section Heteroskedasticity LR Test

Due to omission of variables and the presence of outliers, heteroskedasticity test has to be carried out, outcome shown as table 5. Heteroskedasticity on cross section perspective is strongly detected with probability being zero, which means standard error before was inaccurate, in need of correction with robust standard error reported as table 6.

Variable	Coefficient	Robust S.E.	t-Statistic	Prob.
FCPS	-0.003835	0.004779	-0.802446	0.4234
GROWTH	0.069997	0.130414	0.536728	0.5922
LEV	-0.068388	0.169957	-0.402384	0.6879
OCONF	-0.484664	0.171006	-2.834189	0.0052***
ROE	-0.001857	0.001289	-1.440761	0.1515
SIZE	0.006913	0.058024	0.119134	0.9053
Intercept	1.314662	0.729576	1.801952	0.0734*
R-squared	0.798506	Mean dependent var		0.889868
Adjusted R-squared	0.725676	S.D. dependent var		0.313746
N		227		

Significant at * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6 OLS robust standard error

As can be seen from above, overconfidence variable has robust standard error of 0.171006 with probability of 0.0052, significant at the level of 1%. The overall outcome turns out much better than that of the previous OLS regression, suggesting better fitness of the model.

3.4.2 Analysis on managerial overconfidence and level of cash dividend payout

As to model regarding to hypothesis 2, we only consider it when dependent variables are larger than or equal to 0, making cash dividend payout rate discontinuous as observations of the dependent variable. Under such circumstances Tobit model fits the criteria better, able to adjust to possible weird distribution with the existence of dummy variable. Using panel data on firm level as research data, it is very likely that fixed effect emerges, where Tobit model is not so suitable here, making application of OLS regression necessary for analysis. Results of OLS regression are in table 7 as below.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FCPS	0.055692	0.014428	3.860016	0.0002***
GROWTH	0.198365	0.314360	0.631012	0.5289
LEV	0.264155	0.366142	0.721454	0.4716
OCONF	-0.041661	0.365204	-0.114076	0.9093
ROE	0.002639	0.001858	1.420009	0.1575
SIZE	-0.651362	0.171523	-3.797516	0.0002***
Intercept	8.170888	1.905709	4.287585	0.0000***
R-squared	0.928827	Mean dependent var		1.296716
Adjusted R-squared	0.903101	S.D. dependent var		1.154837
N			227	

Significant at * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7 OLS regression for Hypothesis 2

Table 7 summarizes the results derived from OLS model, taking cross-section fixed effect and period fixed effect into consideration. While p-value of overconfidence being 0.9093, there is no enough evidence to testify

hypothesis 2. As there are floors for the dependent variable, div, to be larger than or equal to zero, Tobit regression is used instead.

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Retail/Wholesale	-0.924766	0.275181	-3.360570	0.0008***
Multi-Sector Conglomerates	-0.407446	0.331632	-1.228609	0.2192
Industrial Products	0.614698	0.378777	1.622849	0.1046
Construction	-1.120206	0.625715	-1.790282	0.0734*
Oil/Energy	-0.120856	0.349514	-0.345783	0.7295
Computer and Technology	-0.709307	0.279633	-2.536564	0.0112**
Medical	-1.054801	0.277359	-3.803023	0.0001***
Auto/Tires/Trucks	-2.037639	0.446617	-4.562385	0.0000***
Aerospace	1.361802	0.362442	3.757294	0.0002***
Consumer Discretionary	-1.006602	0.312431	-3.221838	0.0013***
Consumer Staples	-0.120344	0.287255	-0.418944	0.6753
FCPS	0.044019	0.019499	2.257518	0.0240**
GROWTH	-1.089588	0.571781	-1.905604	0.0567*
LEV	-0.816474	0.341457	-2.391148	0.0168**
OCNF	-0.535370	0.706671	-0.757594	0.4487
2008	-1.517220	0.276033	-5.496519	0.0000***
2009	-1.331397	0.269489	-4.940455	0.0000***
2010	-1.452576	0.272127	-5.337856	0.0000***
2011	-1.284719	0.274070	-4.687556	0.0000***
2012	-0.993668	0.267771	-3.710894	0.0002***
2013	-0.981945	0.275838	-3.559863	0.0004***
2014	-0.723581	0.274104	-2.639802	0.0083***
2015	-0.495845	0.282655	-1.754241	0.0794*
2016	-0.162265	0.286250	-0.566863	0.5708
ROE	0.012159	0.003129	3.885707	0.0001***
SIZE	0.468407	0.113374	4.131520	0.0000***
Intercept	-1.932628	1.403138	-1.377362	0.1684
Mean dependent var	1.296716	S.D. dependent var		1.154837
S.E. of regression	0.739259	Akaike info criterion		2.407497
N			227	

Significant at * p < 0.10, ** p < 0.05, *** p < 0.01

Table 8 Tobit regression

Table 8 presents the results of regression in Tobit model. Seen from the regression results, managerial overconfidence is negatively correlated with cash dividend payout level, yet not significant. That the more overconfident managers are, the lower cash dividend payout level is, might be a stochastic incident. This conclusion does not support the second hypothesis the thesis put forward, and also conflicts with previous literature, such as Deshmukh, Goel, Howe (2008) and Codeiro (2009).

As to the reason that might caused the difference, sample we selected started from 2008 while the US was the main country to be affected by the financial crisis back then, and most listing companies lost their source of funding then consequently went bankrupt. Cash dividend happens to be one of methods to make up to investors, and meanwhile firm managers were likely to give out higher level of cash dividend in gesture to attracting more investments and funding.

3.5 Discussion

The chapter made brief introduction and explanation towards selection of sample and data source of the US listing companies' samples from year 2008 to 2017. Based on research assumptions, this chapter used OLS, Logistic and Tobit models to respectively tested the impact of managerial overconfidence on the willingness and level of listing companies paying out cash dividend. After going through descriptive statistics of main variables of sample companies, we dealt with correlation analysis and empirical regression tests, and drew following conclusions.

Compared to listing companies without overconfident managers, those with overconfident managers are less willing to pay out cash dividend.

Successfully testifying the negative correlation between managerial overconfidence and willingness of paying out cash dividends, results from the Logistics model may differ from those of Wrońska-Bukalska (2018).

Growth and size are positively correlated to willingness to pay out dividends, both significant at level of 10%, suggesting bigger firms with a faster pace of development tend to pay out cash dividends. Lev and roe have negative relation with the dependent variable, indicating the higher leverage is, the less willing those firms are to pay out dividends. Fcps is negatively correlated to willingness of paying out cash dividends, significant at the level of 5%, colliding with the research of Wrońska-Bukalska (2018) who made judgements by designing questionnaire for managers to quantify their beliefs, attitude and perception on their certainty of success. We share the similarity with Cordeiro (2009) that we both referred to methods used by Malmendier and Tate (2005a), but different conclusions were drawn probably due to different controlling variables selected. Consequently, it is impractical to do comparisons between our research.

From the perspective of level of dividend payout, empirical research part has revealed the results of significant correlation between level of dividend payout and managerial overconfidence, which means hypothesis 2 is yet not supported by our sample.

The samples used in this paper exhibit no significant relation with the amount of cash dividend payment. In terms of research conclusions, this thesis drew a conclusion that the correlation between overconfidence level and amount of dividend to pay out is negative, but only on few random occasions, leaving most scenarios uncertain. Among controlling variables, fcps has positive coefficient and growth rate has negative coefficient, both significant at level of 5% and 10% respectively. Such finding agrees with that of Deshmukh, Goel, Howe (2008) using method of measuring frequency of existing key words hinting managers' attitude on media and press.

4 Conclusion and Improvement

4.1 Conclusions

Traditional corporation finance theory has basic assumptions of rational economic man and effective arbitrage, doing research about corporation financial behavior in the frame of effective market assumption. Such strict assumptions greatly drifting from reality would be rather likely to lead to huge difference between research conclusions and realistic conditions, giving ground to the popular research field of dropping the rational economic man assumption and introducing irrationality characteristic of market participants into study about behavior and decision making on firm level. In the 1980s, behavioral finance theory arose, when scholars started to realize irrational behavior might have effect on corporation making financial decisions and financial assets pricing, thus successfully explained abnormalities in financial market through such theory. Therefore this thesis similarly excluded traditional rational economic man assumption and with the assistance of behavioral financial theories, added psychological preference of company managers to the decision making process in listing companies, then did research on how managers of listing companies being overconfident may impact companies setting dividend payout policy.

After attempting to figure out the relation between overconfidence and cash dividend payout with existing agency costs theory and self attribution bias, the thesis summarized previous relative literature on psychological preference of investors and firm financial policies. Comparing pros and

cons of various measurements of overconfidence upon summarizing, categorizing and analyzing works of available research, this paper simplified and quantified methodology of quantifying overconfidence on the basis of the measurement originally put forward by Malmendier and Tate (2005a), regarding level of overconfidence as the proportion of insiders holding the firm options and coming up with two research hypothesis correspondingly. Selecting data of the US listing companies from 2008 to 2017 as sample, setting elements potentially affecting company dividend payout such as return on equity, free cash flow per share as controlling variables, OLS, Tobit and Logistic models are applied to empirically test the sample data and carry out tests on hypothesis. Main conclusions are as follows.

In regard to the first hypothesis, compared to listing companies with managers free of overconfidence issues, those with overconfident managers have less willingness to pay out cash dividend. First off, the thesis applied binary Logistic model for regression to test the relation between overconfident managers and whether dividend is paid out. It is found out that managers being overconfident has significant impact on how the firms pay out dividends, in the way that the willingness of American listing companies paying out dividend decreases while the level of managerial overconfidence increases. Afterwards, OLS model is also applied to control the possible impact of different industries and time may have on the conclusion, where the conclusion turns out to be consistent with that from the binary Logistic model. It is thus strongly confirmed that the conclusion made when we set the proportion of unexercised options

over 0.7 as being overconfident supports such point of view. This result allies with the conclusions of Malmendier and Tate (2008), Sanjay Seshmukh (2009).

As for the second hypothesis, given that managers are overconfident, if listing companies have the willingness to pay the investors dividend, it remains uncertain whether the amount of dividend paid is more or less than that by companies without overconfident managers. In empirical test, Tobit regression showed a slightly below zero, neglectable coefficient between level of overconfidence and amount of dividend payout, which is far from being significant enough to take into account. Nevertheless, this conclusion does correspond with the result from OLS regression model which applied cross-section fixed effect, that there is no significant correlation between overconfidence and amount to pay out dividend detected. Taking previous literature into consideration, we claim that how much American listing companies with overconfident managers tend to pay out cash dividend is still questionable.

4.2 Drawbacks and Potential Improvement of the Thesis

The thesis theoretically analyzed the relation between managerial overconfident organizational behavior and cash dividend payout policy and empirically tested it with sample of the US listing companies, offering new practical proof of irrational corporation financial behavior from the perspective of overconfident managers. However, there remains a few drawbacks to be improved hopefully in the near future.

Taking realistic conditions of American listing companies into consideration, the thesis decided to innovate with inspiration of theory from Malmendier and Tate (2005a). Built on the theory published, the simplified model has not yet been sufficiently testified with empirical research, whose practical use is in need of further discuss.

The thesis theoretically analyzed the impact of managerial overconfidence on the level of cash dividend paid out, yet the analysis has not been fully proved in the empirical research. Different regression models presented the same conclusion in response to the effect of overconfidence on the amount of cash dividend paid that no significant relation between the two is detected. Considering such deviation from previous research, we believe that it is quite necessary to figure out whether this phenomenon pops up because of the real features of the sample or different measurements of overconfidence by various scholars.

Despite the core concept of the research being impact of managerial overconfidence on dividends policy, dividend policy of listing companies consists of cash dividend but also share repurchase. Part of companies may not pay out cash dividend out of their tendency for share repurchase. However we did not actually consider the impact of managerial overconfidence on willingness of listing companies to run share repurchase and such amount. Then there should be much space to carry out research

on the impact of managerial overconfidence on general dividend policy, including other various ways to pay out dividends.

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