The University of Hull

AN INVESTIGATION OF CASH HOLDINGS, DEBT MATURITY, AND CORPORATE PERFORMANCE CONSIDERING MANAGERIAL OVERCONFIDENCE: EVIDENCE FROM LISTED VIETNAMESE FIRMS

A thesis submitted to the University of Hull in conformity with the requirements for the degree of

Doctor of Philosophy in Finance

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May, 2019

ABSTRACT

One of the most important objectives of any firm is maximizing firm value. In order to achieve that goal, many different aspects come into play. One of those aspects is financial decisions. Financial decisions are mostly determined by managers, therefore, it can be stated that managers are people who play the main role in determining the success of firms. Stemming from this statement, this study attempts to investigate the impact of managerial overconfidence on some financial management aspects, including cash holdings, debt maturity and firm performance. Furthermore, the thesis also expands the research to examine the impact of managerial overconfidence on the deviation between the actual level of cash holdings and the optimal level of cash holdings, and the deviation between the actual level of debt maturity and the optimal level of debt maturity. By mainly focusing on data from 123 face-to-face interviews with top-line managers of Vietnamese non-financial listed firms, the thesis uses data on voice pitch to measure managerial overconfidence and test the effect of managerial overconfidence on the research topics. Besides using voice pitch, to strengthen the empirical results, the study also uses some other measurements of managerial overconfidence, including psychometric testing, bias in earnings forecast, manager's gender, the visibility of CEOs' photographs in firms' annual reports and, a comprehensive index from multiple measurements of the research. The findings indicate that, firstly, firms with overconfident managers tend to hold less cash but the actual level of cash holdings is not far from the optimal level of cash holdings. Secondly, overconfident managers prefer using long-term debt over short-term debt, and they tend to make a higher deviation between the actual level of debt maturity and the target level of debt maturity. Finally, managerial overconfidence is found to be associated with a better result of firm performance.

ACKNOWLEDGEMENTS

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LIST OF ABBREVIATIONS

AR: Order autocorrelation

CAO: The chief accounting officer

CCC: Cash conversion cycle

CEO: The chief executive officer

CFO: The chief financial officer

CIEM: The Central Institute for Economic Management

EBIT: Earning before interest and tax

FCF: Free cash flow

FE: Fixed effect

FED: The Federal Reserve System

GDP: Gross domestic product

GLS: The generalized least square

GMM: the generalized method of moments

GSO: The General Statistics Office of Vietnam

HNX: Hanoi stock exchange

HOSE: Ho Chi Minh City stock exchange

IPO: Initial public offering

LOE: Law of enterprise

NWC: Net working capital

OECD: The Organisation for Economic Co-operation and Development

OLS: The ordinary least squares

RE: Random effect

ROA: Return on asset

ROE: Return on equity

SBV: the State Bank of Vietnam

SMEs: Small and medium-sized enterprises

SSC: The State Securities Commission

UK: The United Kingdom

UpCom: The Unlisted Public Company Market

USD: The United States dollar

VCBS: Vietcombank Securities Limited Company

VND: Vietnam Dong

CHAPTER 1: INTRODUCTION

1.1. Introduction and background

Managerial overconfidence might cause unexpected outcomes in corporate management due to subjective, and aggressive decisions. According to Ackert and Deaves (2010), overconfident people might misjudge their abilities and knowledge, and then might lead to overestimate the precision of their predictions. Similarly, Adam et al. (2015) and Heaton (2002) show there is an increase in the risks of the corporation or a decrease in the positive NPV of projects, increase in the cost of external financing and raise their investment sensitivity to free cash flow, which is relevant to managerial overconfidence. Moreover, it is indicated that managerial overconfidence might prefer using internal finance to source debt and debt to equity, which might lead to them holding less cash and put firms under liquidity risks (Huang-Meier et al., 2016). Therefore, there is a suggestion that managerial overconfidence might have a significant impact on aspects of corporate management such as cash holdings, debt maturity and firm value, in which cash might be hold less, short-term debt might be used more and there can be worse results in firm value in firms with overconfident managers. By using the unique measurements for managerial overconfidence, this study is believed to provide confident empirical results in examining the relationship between managerial overconfidence and cash holdings, debt maturity and firm value. Those measurements include the unique one namely voice pitch analysis, besides it some other popular measures from previous studies are also used such as psychometric test, bias in earning forecast, the visibility of CEO's photos in annual reports, and managers' gender, and the other very important measure is come from the combination of all used proxies called a comprehensive proxy. The newly proxies of managerial overconfidence can be considered as very strong measurements and is believed to bring the best regression estimation in empirical study.

The most important objective of a firm is maximizing the firm value and then maximizing the shareholder wealth. Simply understood, shareholder wealth can be maximized through the dramatic increase in the firm's share value. Many traditional economic theories imply that the company might maximize shareholder wealth by running projects with a positive net present value. However, in order to achieve this goal, firms depend mostly on the decisions of managers. Managers who make all decisions in corporate management can be said to play a vital role in the success or failure of firms. Therefore, investigating the traits

of managers and their effect on corporate management can help to manage firms more effectively, minimize risks and gain more successful outcomes. In fact, many recent studies find that managerial overconfidence is one of the very important manager attributes, which should be examined carefully when studying corporate management. For example, there have been a number of papers showing that managerial overconfidence has a significant relationship with corporate behaviors and their outcomes (Bertrand and Schoar, 2003, Malmendier and Tate, 2005, 2008, Malmendier et al., 2011, Huang et al.,2011, Kaplan et al., 2012, Dullman, 2012, Hirshleifer et al., 2012, Shu et al., 2013, Deshmukh et al., 2013, Adam et al., 2015, Huang et al., 2016, Hribar and Yang, 2016). Furthermore, following most recent studies, Adam et al. (2015) and Hribar and Yang (2016) state that overconfident managers might misjudge their abilities, knowledge, and predictions and hence cause failed management decisions. Stemming from those statements, this study attempts to investigate the impact of managerial overconfidence on some aspects of corporate management including cash holdings, debt maturity and firm performance. Accordingly, we believe that overconfident managers might make more aggressive decisions than their non-overconfident counterparts, and hence might lead to unexpected results in corporate management. Those aggressive decisions can be holding too little cash as cash is used for investing purposes and using more short-term debt to lower the cost of using debt, and thus leading to a bad result in firm performance. It can be stated that cash holdings, debt maturity and firm performance are three of the most important aspects of corporate management. While the holding of cash in firms keep them safe to meet the daily expenses and unexpected events, it also helps firms earn money from speculations. Debt maturity helps firms effectively manage borrowing sources to maximize profit, but also minimize the cost of debt. Finally, all of the corporate decisions are aimed at achieving the best firm performance.

Cash is also a form of the most liquid asset in firms. It is in this study considered as cash and equivalents plus short-term investment. Cash is normally used for everyday transactions, sudden investment opportunities, due date payables or precautionary motives. For example, looking back to one of the first studies of cash holdings, Keynes (1936) states that there are two main advantages of holding cash, namely lower transaction cost from using internal capital sources and avoiding risks from unexpected contingencies. For the transactional motive for cash reserves, Miller and Orr (1966) also confirm that brokerage

costs might persuade firms to hold more cash, and additionally, the cost of using external financing is more costly than using internal financing from the storage of cash (Myers and Majluf, 1984). In terms of precautionary motives, Opler et al. (1999) also stress that a motive is if the volatility of cash flows is high and that firms with financial constraints should hold more liquid assets. Therefore, holding cash is definitely necessary for firms, however, the optimal level of cash holdings is still a difficult question for managers. Because holding less cash might be risky for firms when firms do not have enough cash for everyday transactions, they lose speculation opportunities or they even put the firm at risks due to unexpected events. However, if holding too much cash, firms might be using it less effectively. In fact, we cannot earn more money or profit from the cash we are holding in the vault or even in bank accounts. Therefore, it is necessary to know what determines the cash holdings and its effect on the optimal level of cash holdings. According to Miller and Orr (1966) and Kim et al. (1998), a higher level of cash holdings is predicted to be more in higher profitable firms as an easing of the financial situation. Additionally, Almeida et al. (2004) also indicate that the level of cash reserves depends on the accessibility of capital sources of firms. That means that firms which find it difficult to access external financing tend to reserve more cash. Other findings show a lower propensity for holding cash is recognized from diversified firms (Tong, 2009), firms with higher information asymmetry (Drobetz et al., 2010), and firms with poor corporate governance (Dittmar and Mahrt-Smith, 2007, Harford et al., 2008). Actually, it can be said that a firm is a portfolio of assets, in which cash is one of those firm's assets. Normally, a firm's assets are composed of the firm's equity and liabilities, therefore if the default risk rises, firms tend to reserve more cash in response (Acharya et al., 2012). There are several theories explaining the pattern of cash holdings such as trade off theory, pecking order theory and free cash flow theory. Trade off theory describes some benefits of holding cash, such as minimizing the risks from financial distress, more opportunities for investment, and reducing the cost of using external sources (Ferreira and Vilela, 2004). Regarding pecking order theory, the most prior financing source is retained earnings, and the order after that is debt and, finally, equity to avoid more asymmetric information costs and other transaction costs (Myers, 1984). Finally, free cash flow theory suggests that cash reserves help firms remain under the manager's control and gain more benefits from speculations (Jensen, 1986).

Debt is one of the very important capital sources of firms. It helps to build up the firm's

assets besides shareholder's equity. One of the decisions relating to employing debt in the capital structure is determining the maturity of the debt. Different from using capital from retained earnings or internal sources, the cost of using debt might be higher for transaction costs and information asymmetry costs. However, the difference in cost of debt also varies depending on the maturity of the debt. It is believed that short-term debt is more effective than long-term debt as short-term debt can help to reduce agency costs (Myers, 1977, Barnea et al., 1980). However, there are some arguments stating that long-term debt can help to boost the firm's value as it helps to reduce tax expenses due to the advantage of financial leverage (Brick and Ravid, 1985). Moreover, due to the problem of asymmetric information, long-term debt can be a better choice for firms in the long term (Goswami et al., 1995). Additionally, Guedes and Opler (1996) believe that short-term debt is riskier than long-term debt when the maturity is short and firms might fall into the hard situation of having to renew debts. By contrast, Guedes and Opler (1996) also argue that the use of long-term debt can reduce the profits of firms, as the cash flow returns might be sooner than the due date of the debts. Therefore, it is necessary to investigate the determinants of debt maturity. From the empirical point of view, there have been a number of studies finding out the factors affecting debt maturity. For example, an early study suggests that smaller firms have a higher propensity to use short-term debt (Titman and Wessels, 1988). In contrast, larger firms and firms with more investment opportunities tend to use more long-term debt (Barclay and Smith, 1995). In a different approach, debt maturity is suggested to be negatively impacted by earnings surprises, corporate tax rate and firm's risk (Stohs and Mauer, 1996). Ozkan (2000) illustrates that firm size and asset maturity are positive factors affecting debt maturity, and growth opportunities negatively impact the choice of debt maturity. In fact, decisions on whether short-term debt or long-term debt is better to represent an important decision in debt management. From a number of previous studies, we find that there are three main strands of debt maturity theories. Firstly, the choice of debt maturity is based on the tax minimization target of firms. Following the study of Brick and Ravid (1985), long-term debt is a better choice if the term-structure of interest rates is upward sloping as it can help to get benefits from the tax shield. Secondly, the decision of debt maturity is based on asymmetric information problems (Fama, 1990, and Flannery, 1986). As Flannery (1986) explains, high-quality firms tend to use short-term debt to signal their quality. Finally, the last strand is the issue of contracting costs.

According to Myers (1977), short-term debt helps to minimize the underinvestment problem. Furthermore, Barnea et al. (1980) believe that the value of short-term debt is less sensitive, therefore, it might help to reduce the asset substitution problem. Moreover, from the strands of asymmetric information problems and contracting cost problem, it is believed that firms tend to choose a debt maturity that matches with the maturity of their assets (Hart and Moore, 1994).

Investigating the issue of firm value can be seen as the most important study on the corporate management research agenda because the most important objective of firms is maximizing firm value. Good firm value can be represented through a good firm performance or profitability, which is very essential for sustainable firm growth. Therefore, doing research on the aspect of firm value and to find what determinants of firm value are obviously necessary. The term firm value in this study is sometimes called firm performance, and these two terms are considered as having a similar meaning. In fact, the investigation of the determinants of firm performance can provide a deep look at what drives firm value or firm performance, which helps researchers, managers and policymakers gain more knowledge and a basis in corporate management. In the corporate management literature, there are two main streams of research on the determinants of firm value. The first is based on traditional economic theory with external market factors, while the other one is based on the firm level. Some earlier studies determined the relationship between firm value and industry factors. For instance, Schmalensee (1985) indicates that the impact of industry factors on firm value accounts for approximately 20% of the variation in business-unit profits. This research also stresses that industry factors are the major subjects affecting a firm's profitability. In contrast, Mauri and Michaels (1998), McGahan and Porter (2002), Ruefli and Wiggins (2003), and Mcnamara et al. (2005) state that firm-level factors are more important and have a greater effect on firm value than the industry level. In terms of firm-level factors, there are several factors affecting firm value found from previous studies, such as inside manager and managerial ownership (Mace, 1971, and Vancil, 1987), board of directors (Yermack, 1996), compensation of CEOs (Core et al., 1999, Mehran, 1995, Zang and Gao, 2015, and Wang and Chen, 2016), CEO turnover (Huson et al., 2003), CEO duality (Yang and Zhao, 2014, and Berardino, 2016), family ownership (Dyer, 2006, and Anderson and Reeb, 2003), board size (Najjar, 2014), gender of managers (Liu et al., 2013), manager's age (Mohamed et al., 2015), and payout ratio

(Giriati, 2016). Generally, it can be seen that there are a number of factors believed to be significantly impacting firm value. Therefore, to examine more carefully in terms of the determinants of firm value, the research into this aspect is going to be investigated in more detail in the next two chapters.

In general, cash holdings, debt maturity and firm value are seen as important aspects in corporate management. Investigating the determinants of those aspects is vital for researchers, managers and policymakers. In fact, there have been a number of studies mentioning a variety of those aspects' determinants, but not many of them or just a very few studies mentioned the managerial overconfidence effects. Overconfident managers are believed to make different decisions compared to non-overconfident managers. For example, overconfident managers have a preference to use internal financing over external financing for investing in projects, and also are more likely to raise funds from debt rather than equity (Heaton, 2002, Malmendier and Tate, 2005). Furthermore, compared to non-overconfident counterparts, overconfident managers have a higher propensity to pay less dividend (Cordeiro, 2009, Deshmukh et al., 2010). In the studies of Liu and Taffler (2008) and Malmendier and Tate (2008), firms with overconfident managers tend to have more M&As than firms with non-overconfident peers. Overconfident managers are also believed to make more aggressive decisions as they are always overconfident about all situations. For instance, Cordeiro (2009), Deshmukh et al. (2010), Malmendier and Tate (2005), and Puri and Robinson (2007) illustrate that overconfident managers tend to over-predict the future performance of the firm and overestimate the investment projects, hence they might cause unexpected outcomes. From those conclusions, it is believed that overconfident managers might also make more aggressive and risky decisions related to cash holdings and debt maturity, and finally might lead to bad results in firm performance. In terms of cash holdings, there have been several studies mentioning indirectly the use of cash in firms by overconfident managers. In particular, Malmendier and Tate (2008) and Ferris et al. (2013) indicate that overconfident managers are more likely to use cash and debt for acquisition purposes, Additionally, Malmendier et al. (2011) also stress that cash is the prior preference for overconfident managers compared to non-overconfident managers when raising funds. Regarding debt maturity, Yu et al. (2006), Landier and Thesmar (2009) and Thesmar (2009) suggest that non-overconfident managers believe that short-term debt is more risky, while overconfident managers have different thoughts, and they stress that overconfident

managers are more likely to use short-term debts over long-term debts. These two scholars also explain that overconfident managers tend to overestimate their securities and also underestimate the default risks and therefore prefer to use short-term debt to maximize the allocation of cash flows. In addition, in the study of Flannery (1986) explains that, based on the theory of information asymmetry, overconfident managers normally have more private information and tend to issue short-term debts to signal the market. From those two impacts of overconfident managers on cash holdings and debt maturity, we also have a basis to believe that aggressive decisions due to managerial overconfidence might have negative impacts on firm performance. Actually, there is very little evidence discussing the effect of managerial overconfidence on firm value or firm performance. Throughout the literature, we find a conclusion from the study of Jiang et al. (2011), in which overconfident managers are demonstrated to tend to reduce the firm value due to overinvesting. On the other hand, the relationship between managerial overconfidence and firm value is stated as being ambiguous in the research of Fairchild (2007). From the analysis above, we decide to conduct the research by examining the relationship between managerial overconfidence and cash holdings, managerial overconfidence and debt maturity, and managerial overconfidence and firm performance, and we predict that managerial overconfidence might tend to hold less cash, issue more short-term debt and also may cause a decrease in firm value. In addition, besides investigating the impact of managerial overconfidence on cash holdings, debt maturity and firm value, the study also extends to researching the effect of managerial overconfidence on the deviation of the actual cash holdings level compared to the optimal cash holdings level, and the deviation between the actual debt maturity level and the optimal debt maturity level. We also predict that managerial overconfidence might cause a higher deviation in both actual cash holdings and debt maturity compared to the optimal levels.

By concentrating on the Vietnamese market, this study conducts the research by examining the data on Vietnamese listed firms on the Vietnamese stock exchange market from 2005 to 2016. Most importantly, to measure the term of managerial overconfidence, the study attempts to use several measurements to avoid a bias in regression estimations, in which the most important and unique measure comes from the analysis of the manager's voice pitch through face-to-face interviews with top-line managers of non-financial listed firms, whereby the interviews were conducted into two periods in early 2017 with 79 interviews

and late 2017 to early 2018 with 44 interviews. For the other firm data, the research year database is 2016 for cross-sectional data and from 2005 to 2016 for the panel, however, for all interviewed managers, their tenure is at least 0.5 years if they are interviewed in early 2017 and at least 1.5 years if the managers are interviewed in late 2017 to early 2018. Therefore, the years for all data are consistent. Vietnam is a developing market and might have more different and novel characteristics compared to other markets, especially developed markets. For example, in terms of political, very different with multi-party system like in the United Kingdom or in the United State, Vietnam is a one-party state ruled by the Communist Party of Vietnam, which provides strategic direction and decides all major policy issues (gov.uk, 2019). Additionally, Vietnam is one of the more politically stable countries in South East Asia (gov.uk, 2019). Regarding recent economic situation, GDP per capita has increased by 350% since 1991 (2nd only to China) and become a very attractive FDI destination with the FDI inflows is about 8% of annual GDP, which is the highest among major emerging markets in ASEAN and proportionately larger than China (gov.uk, 2019). In terms of corporate governance, the quality of Vietnam's corporate governance is considered still below international standards and is at a medium level quality (Tran and Holloway, 2014). Furthermore, there have not been many studies focusing on Vietnam. Therefore, we expect to find a number of significant results from this study. The following part is going to describe briefly the economy of Vietnam, securities market and corporate governance.

1.2. Vietnam's economy, securities market and corporate governance

1.2.1. Vietnam's economy

In order to do research in Vietnam's market, this section provides a brief overview of Vietnam's economy, and after that, a summary of the Vietnamese securities market and corporate governance is presented in the next two sections.

Firstly, describing the role of the government, Vietnam's government still plays a very important role and can deeply interfere into social-economic activities such as allocating land and capital, and banking controlling (The central bank is not independent). Actually, Vietnam is now attempting to reduce this role and encourage the development of the private sector, even though the state-owned enterprises are still the "flagships" of the economy (Witt and Redding, 2014). As per the statement of Masina (2010) and Le (2011), Vietnam can be seen as a neo-liberalist or neo-capitalist state rather than an original free-market

economy. Unlike most other nations, Vietnam is a one-party state nation that is controlled by the sole leadership of the Communist Party of Vietnam. This control leads to privileges and monopolies for enterprises under the management of the state, such as state-owned Enterprises. Generally, in Vietnam, the state leadership has the most absolute power for considering and deciding strategic issues at the country and business levels.

According to the World Bank (2016), Vietnam is a development success story or the other Asian tiger (The Economist, 2016). Especially after launching political and economic reforms in 1986, Vietnam has been changing significantly from one of the poorest nations to an emerging nation over the last 30 years, with the average income of just about $100 per capita in 1986 to $683.6 in 2005 and to about $2,170.65 in 2016. However, the growth rate of the GDP shows a slight decrease in the percentage over the last 11 years from 7.5% in 2005 to 6.2% in 2016 (World Bank).
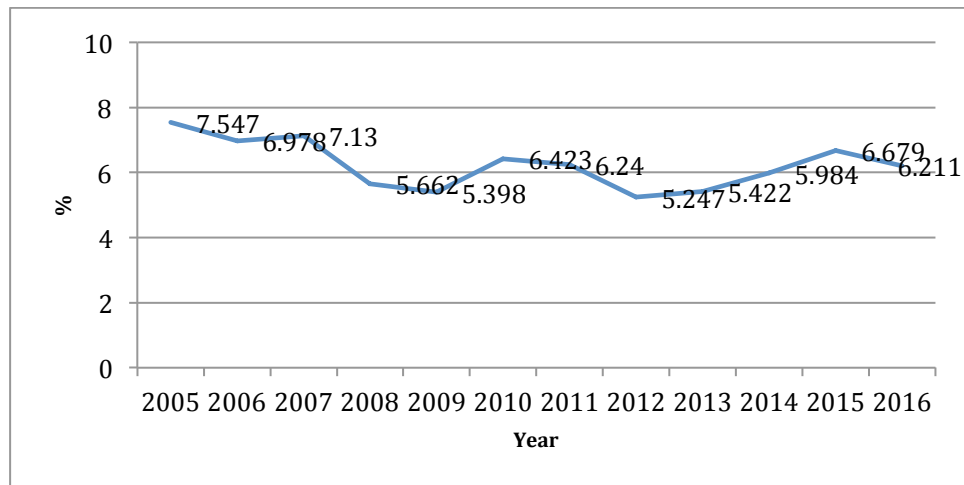
Figure 1.1: GDP growth of Vietnam from 2005 to 2006 (annual %)
(Source: World Bank)

It can be seen that the increase in GDP per capita is remarkable as it shows an increase of nearly 20 times with an average of $886.96 during over 30 years (World Bank). And the highest dollar value is recorded at $2,170.648 in 2016, which is equivalent to 14% of the world's average (World Bank). The growth rate of GDP per capita is also recorded with an average of 5.5% per year since the reforming to the present (World Bank), which demonstrates that Vietnam is one of the fastest countries in the world regarding this index.

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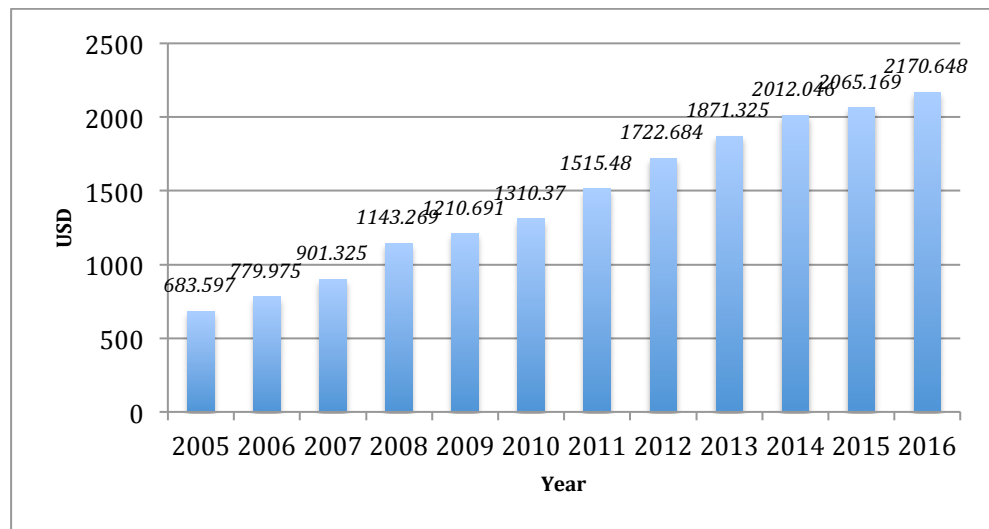
Figure 1.2: GDP per capita of Vietnam from 2005 to 2016
(Source: World Bank)

In terms of inflation, there is a fluctuation but also a significant decrease during the last 11 years from 8.3% in 2005 to 3.2% in 2016. There are two peaks in the inflation rate; firstly, in the recession year of 2008 and secondly in 2011 with 23.1% and 18.7%, respectively. The lowest point of the inflation rate is recorded as happening in 2015 with only 0.88%. It seems that the best time for controlling the inflation rate of Vietnam is the period between 2012 and 2015 when it decreased from 9.09% to only 0.88% (World Bank).
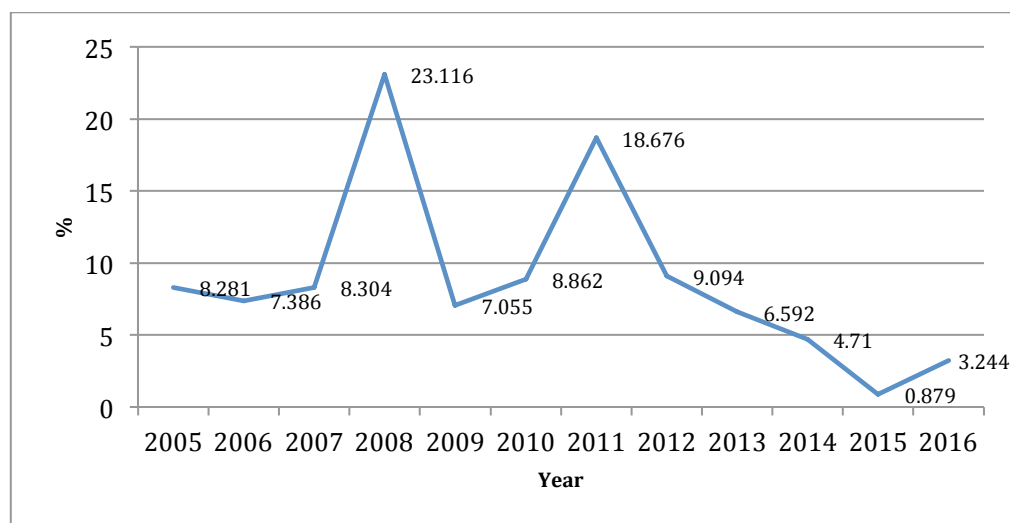
Figure 1.3: Inflation rate of Vietnam (consumer prices, annual %)
(Source: World Bank)

Recently, Vietnam has had much more trade openness to the global economy, especially

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after participating in the World Trade Organization (WTO) in 2007, for example, simplifying the trade rules from the 1990s (The Economists, 2016) and having international economic integration with more free trade agreements with organizations such as Economic Union, the European Union, South Korea, Trans-Pacific Partnership or latest, ASEAN Economic Community from the end of 2015 (World Bank, 2016). All of these activities have brought more opportunities to Vietnam in general and other economic agents in Vietnam in particular. The trade in Vietnam in 2016 is now contributing to 150% of GDP, greater than any other similar income level nations (The Economists, 2016).

The trade openness of Vietnam is also represented through amazing figures of exports and imports over the last 11 years. Specifically, there is a dramatic increase in both exports and imports of Vietnam from 2005 to 2016, reaching the highest point of $170.77 billion for imports and $65.83 billion for exports in 2016. Both exports and imports decreased slightly in 2009 but increased immediately after that. Over the last 6 years, Vietnam's exports have doubled from $72.2 billion in 2010 to $165.83 billion in 2016 as the competitive advantages of minimum wage and low costs of utilities attracted more foreign direct investment into Vietnam, especially in the manufacturing area. For imports, after having a small decrease in 2009, they also experienced a double increase from $84.84 billion in 2010 to $170.77 billion in 2016.
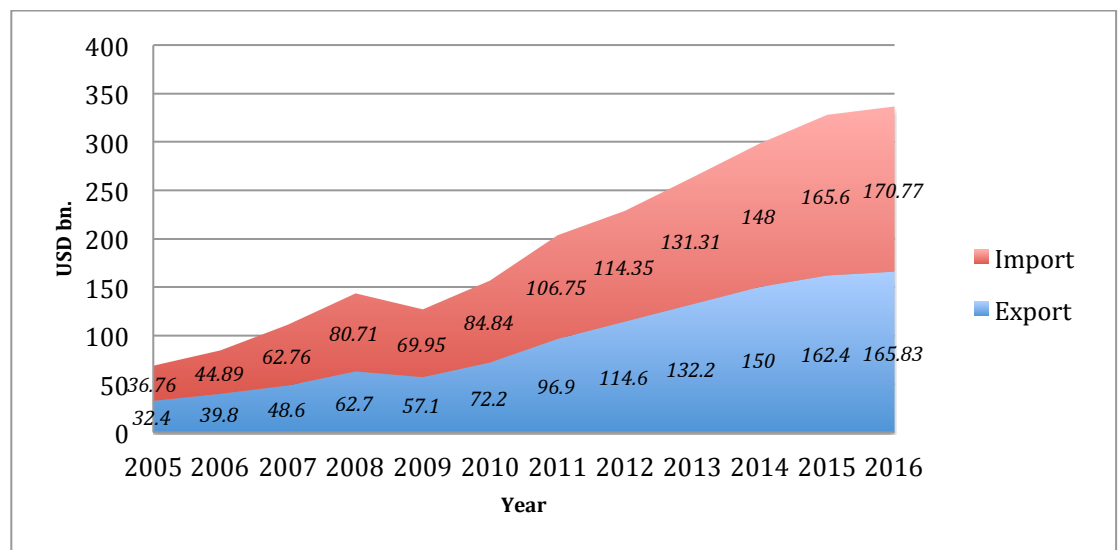
Figure 1.4: Export and import of Vietnam from 2005 to 2016 (USD bn.)
(Source: World Bank)

Along with trade openness, Vietnam's government is quite flexible when enhancing the

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competition among 63 provinces and it also classifies Vietnam's territory following the advantages of each region. For example, Ho Chi Minh City (Saigon) or the south of Vietnam has focused on developing industrial areas, Danang or the middle of Vietnam has been developing high-tech, and the capital or the north of Vietnam has been enhancing manufacturing industries. The diversification in the economy leads to a healthier economy that can help Vietnam withstand economic recession, such as the property crisis in 2011 (The Economist, 2016).

The financial systems in Vietnam are typically centralized and mainly rely on state-owned banks (Witt and Redding, 2014). The banking system has some characteristics, for example, the separation between the central bank and commercial banks and the participation of private banks are allowed. However, the state-owned commercial banks account for 70% of bank loans and banking sector assets in the market (Witt and Redding, 2014). The central bank is not independent like the FED or other developed banking systems in the world, and it is still under the strict control of the government.

Regarding ownership of enterprises, the state-owned enterprises are recognized to contribute about 40% of total GDP, while the other 42% is from household and private-owned enterprises, meanwhile, the remainder comes from foreign-owned enterprises (These figures are gathered from GSO (2010) and Vietnam News (2011) in 2009). State-owned enterprises also have more privileges than others as to they have easier to access to credit and use of land and market. However, state-owned enterprises seem to be an inefficient business when they are the sort of enterprises that lose a lot of money with heavy debts and poor governance due to nepotism and bureaucracy with too many unnecessary layers or staff or even repeated functions. In contrast, private-owned enterprises can be seen as the nutrition for the growth of the economy, even though they have some disadvantages from unfavourable tax and regulations (Witt and Redding, 2014).

1.2.2. Securities market and the banking system in Vietnam

In terms of the stock exchange market, it is still nascent and started in 2000 in Ho Chi Minh City (HOSE) and 2005 in Hanoi (HNX). But it has virtually developed since late 2006. There were only 2 listed companies in 2000 and this increased to 193 listed companies in 2006 and most of them are state-owned enterprises (Witt and Redding, 2014). By 2016, the total number of listed companies on both two stock exchange markets was 691 companies (hnx.vn, hsx.vn - update 26/09/2016), in which there were 648 non-financial firms. At the

end of 2015, the total capitalization of the stock market was equal to 34.5% of GDP. Besides the development of the stock market, the bond market of Vietnam is also developing significantly with a total outstanding volume of about 24.13% of GDP, thus making up to 59% of GDP total of capitalization from both the stock and bond markets (Ministry of Finance, 2015).

With a longer duration of operation, the Ho Chi Minh City stock exchange (HOSE) seems to be an animated market compared to the Hanoi stock exchange (HNX) as it is recorded as accounting for 88% of the total listing capitalization in Vietnam's stock market at the end of 2015. Furthermore, the total number of listed firms on HOSE was 307 firms, with 1.4 quadrillion VND (equal about 60 billion USD, which is equivalent to 27.3% of GDP in 2015 (HOSE, 2015). For the HNX, the total number of listed firms was recorded as being higher than HOSE with 372 firms, however, the total capitalization was only 151 trillion VND (equal about 6 billion USD) by the end of 2015. Besides the two official stock markets of HOSE and HNX, there is also another market called UpCoM, which is the market for unlisted public firms. This market is seen as quite similar to HOSE and HNX but with fewer regulations. By June 2016, the total number of firms trading on UpCoM was over 300 firms with about 100 trillion VND (equal about 4.2 billion USD) in total capitalization (HNX, 2015). The following figure shows a significant growth of the stock market in Vietnam during the last 16 years. It is seen that from the beginning to 2016, the development of the stock market is remarkable.
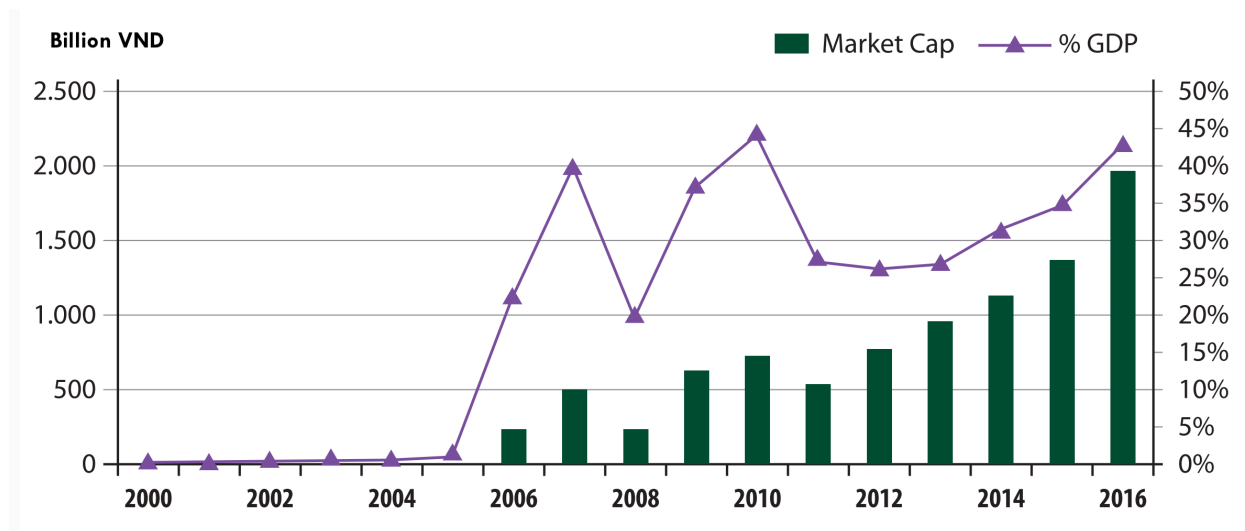
Figure 1.5: Market capitalization of the stock market of Vietnam
(Source: SSC Annual report, 2016)

In terms of the bond market of Vietnam, even though it equalled 24.13% of GDP in 2015, it

is mainly constituted by government bonds. Government bonds account for nearly 90% of the market share in the bond market. The bond market of Vietnam has shown modest growth since the early 2000s. In 2009, it became more official when trading on the HNX with about 30 trading members from the largest commercial banks of Vietnam and securities companies. The maturity structure of the bond market is mainly short-term bonds with a term of fewer than 5 years, accounting for over 70% of total bonds. Regarding corporate bonds, by the end of 2015, they merely accounted for 13-15% in the bond market, and the majority of issuers came from large commercial banks, financial state-ownership companies, real estate firms and few other private firms. The total outstanding volume of corporate bonds was about 142.65 trillion VND (1.8 billion USD), equivalent to 3.4% of GDP 2015. The maturity structures are mostly short-term bonds with maturity dates of less than 5 years and these account for 60% in total. The interest rate is based on the 1-year deposit rate plus a spread of 2-5%. It can be seen that the corporate bond in the bond market of Vietnam is still very modest and the reasons for the less dynamic situation come from the lack of a completed organization which could connect the demand and supply for this market. Also, unlike most of the developed financial markets, Vietnam has no professional credit rating agencies that can help investors evaluate the ranking credit of different corporate bonds. In general, the bond market of Vietnam is still small and undiversified with the drawback that the maturity bonds are mostly short-term bonds. Furthermore, the market for derivatives has not been developed and was planned to be put into operation by 2017. With those shortcomings of Vietnam's bond market, this might create more difficulties for investors and also issuers who want to access this market (Ministry of Finance, 2015).

In terms of the banking system of Vietnam, the banking industry of Vietnam has just started since 1990 with a mono-banking system but has been growing tremendously with a larger number of banks and financial institutions that constitute a different variety of players from small privately held banks to large state-owned commercial banks. In fact, before 1990, the State Bank of Vietnam had the role of both the central bank and a commercial bank, but after that, the central bank was separate. Generally, until 2016, over the last 26 years, the banking system of Vietnam has been changing and improving its efficiency. By the end of 2016, the banking system of Vietnam including 4 state commercial banks, 3 commercial banks acquired by the state bank, 28 joint stock

commercial banks, 3 other type of commercial banks, 27 financial institutions, 4 micro financial institutions, 1,166 credit funds, 8 banks with 100% of foreign capital, and 2 joint venture banks (SBV, 2016).

Currently, the role of the central bank of Vietnam is being responsible for monetary policies, managing foreign exchange reserves, and controlling and supervising credit institutions, financial institutions and commercial banks. Meanwhile, commercial banks are responsible for managing and allocating funds. With the entry in the international market, Vietnam nowadays allows the entry of foreign investors into the banking industry, in which the maximum ownership percentage of a single investor is 15% to 20%, which means the total ownership for all foreign investors can come up to 30%. The commercial banks of Vietnam still play a very important role in the financial market, especially in transferring funds from savers to borrowers, especially investors. The major revenue of banks comprises interest income and non-interest income, in which the income from interest accounts for 70-80%. By the end of 2012, nearly half of the total loans were for non-state-owned enterprises and 16% for state-owned enterprises. Until 2015, 2016, and 2017, the credit growth increased significantly to 12.12%, 10, 46% and 11.02%, respectively. The long-term loan accounts for 52.7% of the total outstanding loans (VCBS, 2019).

1.2.3. Vietnam's corporate governance

Following the latest updated figures in 2018, there are over 561,000 active private sector businesses in Vietnam, whereby 98.8% are micro, small, and medium-sized enterprises (SMEs). SMEs in Vietnam are enterprises with no more than 200 employees, the total capital is no more than 100 billion VND (about 4.4 million USD), and the total revenue is not over 300 billion VND (about 13.2 million USD). Additionally, foreign-invested enterprises are recorded as being about 14,600 enterprises and 2,701 enterprises are the number for state-owned enterprises. Even though there are several remarkable points, as has been mentioned, Vietnam is still far behind some countries such as Indonesia, Malaysia and high-income nations in OECD regarding the quality of regulations on corporate governance (OECD, 2019).

In Vietnam, the State Securities Commission (SSC) plays a leading role in enforcement for non-bank public companies. Meanwhile, the Central Institute for Economic Management (CIEM) has responsibilities for constructing the laws that govern the incorporation of all businesses in Vietnam, including providing the foundations and key principles for

corporate governance of Vietnamese firms. For banks, financial and insurance companies, besides receiving the governance of CIEM, they also comply with the additional corporate governance regulations of the State Bank of Vietnam (SBV) and the Ministry of Finance (OECD, 2019).

The legal framework for corporate governance of all types of enterprises started in 2004 in the Enterprise Law of Vietnam (LOE2005, revised in 2014). This is seen as the first and foremost foundation for the corporate governance system in Vietnam (Le and Walker (2008), focusing on the composition of the board of directors, liabilities of directors, information disclosure, protection of the rights and obligations of shareholders, etc. Moreover, corporate governance focusing on listed firms and public firms developed further in 2006 under the name of the Securities Law. In the following parts, we attempt to provide some key information in terms of corporate governance, and just focus on listed companies.

Firstly, in terms of the rights and obligations of shareholders and owners, the Enterprise Law of Vietnam regulates that a joint-stock company must establish and maintain a register of shareholders from the date of issuance of the enterprise registration certificate. All common shareholders are stipulated as having equal rights, obligations and interests. Also, shareholders have the right to inspect, consult, participate and vote for firms' decisions and activities. They also have the right to transfer their ownership to others. A large shareholder or a group of shareholders who are holding about 10% of the common shares for a consecutive period of over 6 months, has the right to assign people to the Board of Management and the Inspection Committee (OECD, 2019).

Next, in terms of disclosure and transparency, for joint-stock companies, the financial information such as audited annual financial statements and audited semi-annual financial statements need to be disclosed by the end of July each year. Moreover, all the annual financial reports must be approved by the General Meeting of Shareholders to competent state agencies in accordance with the law on accounting and relevant laws. Besides the disclosure of financial information, some related party transactions and non-financial information are also required to be disclosed, such as the transactions between companies, subsidiaries and companies with over 50% or more of charter capital, basic information related to companies' status, organisational structure, ownership, missions, general and specific objectives, targets and plans. At the end of the fiscal year, the board of

management is required to provide annual reports, which consist of all required financial statements and other necessary non-financial information. Generally, the regulations of information disclosure for firms, especially listed firms in Vietnam, are quite comprehensive and make the gap in terms of this aspect between Vietnam and the international standards become narrower when compared to the sub-index of Information Disclosure and Transparency in the World Bank Doing Business 2018 (OECD, 2019).

Finally, regarding the roles and responsibilities of the board of management, the board size is required to constitute 3 to 11 members, in which the term for the independent members does not exceed 5 years and at least one-third of the members are independent members. Furthermore, the composition of the board of managers must be balanced regarding knowledge, experience in law, finance, and business operation, and also gender. The board of directors are stipulated as carrying out certain tasks such as making decisions, setting up targets, plans and business strategies, and managing risk management, capital expenditures and corporate performance. The board of managers also have the right to elect or discharge the chairperson, directors or other managers of the board of management (OECD, 2019).

1.3. Research questions and methodology

1.3.1. Research questions

Based on the objectives of the research, which attempts to investigate the impact of managerial overconfidence on cash holdings, debt maturity and firm value, extended studies are also conducted aimed at examining the effect of managerial overconfidence on the deviation between the actual level of cash holdings and the target level of cash holdings, and on the deviation between the actual level of debt maturity and the optimal level of debt maturity. The research questions are set up as follows.

• *Chapter 1*:

1. What is the impact of managerial overconfidence on cash holding levels?
2. Do overconfident managers lead to higher deviations in the target cash holding level?

• *Chapter 2:*

1. What is the effect of managerial overconfidence on debt maturity?
2. Do overconfident managers lead to higher deviations in the target debt maturity?

• *Chapter 3:*

1. What is the influence of managerial overconfidence on firm value?

2. What is the relationship between cash holdings and firm value?

3. What is the relationship between cash debt maturity and firm value?

For chapter 3, the firm value is expected to be always maximized, therefore, the main question focuses on managerial overconfidence and its impact on firm value. Moreover, the two research questions related to cash holdings and debt maturity are investigated, in which the relationship between cash holdings and firm value, and between debt maturity and firm value is examined. The purpose of those two questions is to find out the indirect relationship between managerial overconfidence and firm value through its influence on cash holdings and debt maturity.

1.3.2. Data collection

The thesis is based on the data of 648 non-financial listed firms on the Vietnamese stock market to conduct the research. In fact, there are three types of data in this study.

Firstly, based on the main purpose of this study, which investigates the effect of managerial overconfidence on cash holdings, debt maturity and firm value, the data collected from the measurement of managerial overconfidence are the number of observations for the sample sizes. Specifically, to make the study become unique and novel, the first measurement of managerial overconfidence is based on the analysis of managers' voice pitch. The managers' voice pitch is collected through face-to-face interviews with top-line managers. The process of collecting interviews from top-line managers is the most difficult part of this study because it is not easy to access managers of the largest companies in Vietnam. A number of methods have been applied such as sending emails, contacting via telephone, asking directly from public meetings or public conferences to ask for the approval for interviews. Consequently, 123 top-line managers of non-financial listed firms accepted the interviews. That means there is a sub-sample size that includes 123 firms. The interviews were conducted over two periods; one was from February to May 2017 with 79 interviews were conducted and the other was from October 2017 to February 2018 with the rest of 44 interviews were conducted. To mitigate the bias in research estimations from empirical results, the study also attempts to find several alternative measurements for managerial overconfidence besides the use of voice pitch. Other methods include psychometric tests for participants in the interviews, the visibility of the CEO's photo in annual reports, the bias in the earnings forecast of the board of management, and the gender of managers in the

interviews. More interestingly, a comprehensive index of managerial overconfidence is constructed by multiple managerial overconfidence measurements used in the research. If any of those measurements are appropriate in the regression models, they will be used to test the research hypotheses. Thus, for sub-sample size, there might have several different models with different proxies of managerial overconfidence. The research year of the sub-sample size is 2016. Although the interviews for managers were conducted in 2017 and 2018, all participants are recognized to have had at least 0.5 years working in the firm. Therefore, the data in 2016 is suitable.

Secondly, besides the sub-sample size, there is also an extended sample size, in which the data are expanded to the whole population with available measurements of managerial overconfidence. In particular, the data of other proxies for managerial overconfidence, except for voice pitch and psychometric test, including the visibility of CEO's photos, the bias in earnings forecast, and the gender of CEOs are available for all listed firms on the Vietnamese stock market. These types of data can be found from firms' annual reports. Therefore, the data for those measurements are collected from all 648 Vietnamese non-financial listed firms. The data was also collected in 2016. The purpose of using this data type is to recheck the empirical results from the sub-sample size regressions. The results from the regressions of this data type are expected to support the estimated results from sub-sample size.

One of the other special things in this study is the diversification among the research objects. In terms of voice pitch and psychometric test, the data is collected from top-line managers of firms including CEOs, CFOs, CAOs, and vice executives. For the visibility of the managers' photos and gender, the research subjects are CEOs. Regarding the bias in earnings forecast, all forecasted indexes are determined by the board of management, thus, the research object is the whole board of managers. The diversification of the research objects helps to minimize the bias in the empirical regression results and also makes the findings become stronger and more reliable.

Third, the final data type is the unbalanced panel data of 648 firms from 2005 to 2016. This data type is used to test the determinants of cash holdings, determinants of debt maturity and the determinants of firm value based on all control variables used in the main regression models from sub-sample size and the extended sample size. That means the data of managerial overconfidence is not used in these models. The results of these regressions

are expected to support the findings of the main models and also help to confirm that all control variables constructed in the main models are appropriate.

1.3.3. Interview design

The purpose of interviewing is to collect the manager's voice pitch and also collect the answers to the psychometric test. Therefore, two groups of questions are designed to ask the top-line managers during the interviews.

The first group of questions is aiming at collecting the voice pitch of managers. Hence, they are open-ended questions that stimulate the managers can answer all questions for as long as possible, which makes it easier to analyse the voice pitch. Furthermore, the questions are designed to be close to the study field such as cash holdings, debt maturity and firm value. The content of the answers is expected to support the findings of the research. The second group of interview questions is a collection of closed-ended questions, aimed at measuring the level of overconfidence through psychometric questions.

All interviews are recorded with the consent of participants. The interview files after that are filtered to separate the voice of the interviewer from that of the interviewees. Then, using the PRAAT software, the voice pitches of managers are analysed.

1.3.4. Methodology

The sub-sample size and extended sample size are a type of cross-sectional data. Therefore, the methods are used to test the research hypotheses are OLS with robust, GLS and instrumental variables GMM (The generalized method of moments) regression for addressing endogeneity problem. As the regression results of OLS are sometimes not strong enough, the results from the GLS regression can help to produce a better estimation. However, both of them are still used to run the regression to support each other. In fact, GLS is considered as a better estimation than OLS for some reasons. Firstly, in order to use OLS, it is necessary to satisfy several properties including each variable can be observed; the error term has constant variance or called homoscedasticity; the sum of error term need to be zero and they are not correlated with each other or saying no multicollinearity in the model; the residual term is uncorrelated with independent variables and the residual term is also uncorrelated with dependent variable (Gujarati, 2009). Therefore, if any of those properties is violated, the estimation becomes bias. While the research models in this thesis is considered not perfected when some explanatory variables might be correlated with error term or other independent variables that is explained in more detail in each empirical

chapter. Secondly, for cross-sectional model there might me a problem that makes the OLS estimation becomes bias is the problem of heterogeneity (Gujarati, 2009). Thus, to address this problem, the method of Generalized Least Square (GLS) and instrumental variables GMM method can be used as better alternative estimations (Gujarati, 2009).

For the panel data type, the panel GLS, fixed or random effects are both used to support each other. Furthermore, the best method that can help to address all problems from other methods, named GMM, is also employed to increase the robustness of the results. In addition to the whole panel data from all 648 firms, there are two sub-sample sizes from panel data that are also identified in the second empirical chapter. In particular, in chapter 3, when examining the determinants of debt maturity in the general case with control variables, the two groups of financially constrained firms and financially unconstrained firms are split. The purpose of the split is to investigate whether or not a difference exists between two groups of financially constrained firms and financially unconstrained firms.

1.4. Contributions

This thesis is expected to generate seven contributions as follows,

- The thesis investigates the effect of managerial overconfidence on cash holdings, debt maturity and firm value. It is believed that based on the previous literature, there is very little evidence or only indirect analyses discussing the relationships between managerial overconfidence and cash holdings, managerial overconfidence and debt maturity, and managerial overconfidence and firm performance. Therefore, this thesis is seen as a unique study as it deeply explores these aspects.

- The thesis is also aimed at examining the impact of managerial overconfidence on the deviation between the actual level of cash holdings and the optimal level of cash holdings, and on the deviation between the actual level of debt maturity and the optimal level of debt maturity. Findings from these investigations are believed to form the other important contribution of this thesis because no study has conducted research in terms of those areas so far.

- Next, the thesis attempts to determine the indirect relationship between managerial overconfidence and firm value through the impact of managerial overconfidence on two aspects of cash holdings and debt maturity.

- The voice pitch used to measure managerial overconfidence is novel, and this makes the thesis becomes unique research using voice pitch to measure managerial

overconfidence. This measurement is shown to be a very strong measurement because it produces similar results in the empirical models with other measurements of managerial overconfidence.

- One of other important contributions of this thesis is the construction of a comprehensive index from multiple managerial overconfidence measurements. The multiple managerial overconfidence measurements are overconfidence measurements used in each research chapter.

- The use of different research objects (including top-line managers, CEOs, and the whole board of managers) to avoid the bias in empirical regression results is also another important contribution of this study.

- Besides the use of different research objects to minimize the bias in the regression results, the using of both a sub-sample size and extended sample size in examining the same issues is also a further contribution.

- There have been very few previous such studies within the context of Vietnam. Therefore, the choosing of Vietnam – a developing country – to do the research can also be a significant contribution. Moreover, the securities market, corporate governance and financial system are still nascent in Vietnam, which thus might bring more interesting aspects to the research.

1.5. Research's structure

The thesis consists of three main empirical chapters. Therefore, the next chapter is the first empirical chapter aimed at examining the relationship between managerial overconfidence and cash holdings. The second empirical chapter is the investigation of the impact of managerial overconfidence on debt maturity. The third chapter focuses on investigating the effect of managerial overconfidence on firm performance. And the last main part is the conclusion.

The whole thesis is organized as follows.

Chapter 1: Introduction

In chapter 1, there is an introduction to the rationale of the study in terms of the three main research aspects, namely cash holdings, debt maturity and firm performance. In this chapter, the overview of Vietnam's economy, the information of Vietnam's government, securities market, financial market, and corporate governance are also provided. After that, this chapter briefly explains the research questions, interview designs, data and

methodologies for each chapter. Finally, the contributions of the whole study are explained clearly in the last part.

Chapter 2: Managerial Overconfidence and Cash Holdings: Evidence from Vietnam

Chapter 2 is the first empirical chapter that focuses on investigating the impact of managerial overconfidence and cash holdings. In this chapter, the rationale of the topic is explained in more detail again and then a brief review of the relevant literature is provided to give an overall picture of the relevant issues related to the definitions and proxies of managerial overconfidence, and the theories and determinants of cash holdings. After that, the most suitable proxies for managerial overconfidence and that fit empirical model are found for the study. In this chapter, the methodology is explained to provide all information about sample selection, data sources, data collection, and interview designs. One of the important sections of this chapter is the detail of the regression models, and the findings and discussion are produced after the section of methodology. And finally comes the conclusion of the chapter.

Chapter 3: **Managerial Overconfidence and Debt Maturity: Evidence from Vietnam**

The structure of chapter 3 is quite similar to chapter 1, but this chapter aims to examine the effect of managerial overconfidence on debt maturity. Therefore, there is just a small difference in terms of the contents. Specifically, the first part is also the rationale of the topic related to what the topic is, why it was chosen and how that was done. The next part is the literature review about the definitions and measurements of managerial overconfidence and the theories and determinants of debt maturity. The third part is the description of the security market in Vietnam, and the purpose of this part is briefly describing what can affect the decision of debt maturity besides the empirical factors from the literature review. Following this section is the methodology part and the part of empirical regression models, results and discussions. The final section is the conclusion for chapter 3.

Chapter 4: Managerial Overconfidence and Firm performance: Evidence from Vietnam

The structure of chapter 4 is also similar to chapter 2 and chapter 3 but focuses on investigating the relationship between managerial overconfidence and firm performance. Accordingly, the first section is an explanation of what is the study, the purpose of the research and how to conduct the research. The following section is a literature review

providing a brief picture of managerial overconfidence and the determinants of firm performance. The next parts are methodology, empirical regression models, findings and discussion. Lastly, the conclusion of chapter 4 is provided.

Chapter 5: Conclusion

The final chapter of the thesis is the chapter of the conclusion. This chapter presents an overview of the rationale of the whole thesis in terms of the impacts of managerial overconfidence on cash holdings, debt maturity and firm performance. Some of the remarkable characteristics of Vietnamese markets are also listed again in this chapter. After that, each empirical chapter is reviewed briefly in separate short paragraphs. A conclusion in terms of the relevant relationship among three chapters is also discussed. The final part is the contributions and recommendations.

CHAPTER 2: MANAGERIAL OVERCONFIDENCE AND CASH HOLDINGS: EVIDENCE FROM VIETNAM

ABSTRACT

The literature argues that overconfident managers tend to hold less cash, leading to a high deviation from the target cash holding levels compared to the optimal cash levels. We analyse the impact of managerial traits, especially focusing on managerial overconfidence, on the corporate cash holdings of listed Vietnamese firms. In order to measure the overconfidence of managers, the most important measure is the voice pitch analysis is used, which are collected through 123 interviews with top-line managers. Furthermore, some other measures of managerial overconfidence are also used to support the regression results namely psychometric test, the visibility of CEO's photo from annual reports, manager's gender, the bias in earning forecast, and a comprehensive index constructed from five prior measurements. Our empirical evidence indicates that higher levels of overconfidence amongst managers are associated with lower cash holdings. More interestingly, the findings show that overconfident managers tend to be associated with a low level of deviation from desired cash holding levels, a finding that seems to differ from the results suggested in the literature.

2.1. Introduction

One of the most important goals of firms is maximizing shareholder wealth by maximizing the share value and hence the value of the firm (Brigham and Houston, 2012). All corporate decisions have influences on the investors' perceptions and lead to a change in share price, significantly affecting shareholder wealth. Therefore, each corporate decision must be examined carefully by the board of management and investigated using empirical studies. In fact, there has been a large number of studies investigating corporate activities and providing findings and guidelines for both business and research purposes. However, the economy moves continuously, and different countries with different financial institutions and different policy management system lead to different outcomes in firm performance with respect to corporate decisions. Corporate decisions of interest include capital structure, debt maturity, payout ratio, investment, working capital, cash holdings, etc.

Among all aspects of corporate management, the decisions related to the holding of cash are selected as the research field of this study. It is seen that cash is an important asset on firms' balance sheets and attracts the concern of managers, investors, and researchers. Furthermore, the trend of holding cash seems to be increasing over time in some countries. For example, Bates et al. (2009) show that the cash holding level of US firms increased from 10.5% in 1980 to 23.2% in 2006. The cash holding level among US firms is also revealed in the research of Dittmar et al. (2007), who show that the level of cash to total assets was 13% in 2003, an increase of nearly 3% compared to 1980. In 2011, the level of holding cash decreased slightly but was still high, with 20.45% among US firms (Gao et al., 2013). In other countries, such as in the Economic and Monetary Union (EMU), the average percentage of cash over total assets is about 15% (Ferreira and Vilela, 2004), and in UK market, the percentage was 9% in 2011 (Al-Najjar and Belghitar, 2011). In Vietnam, it is found that the average total level of cash to total assets was 13.5% in 2016 (see table 2.2). Therefore, we can recognize the importance of cash for the firm's assets and in corporate management, and hence it is necessary to investigate the role of cash holdings, the advantages and disadvantage of holding cash, and the determinants of cash holdings.

According to the academic literature on cash holdings, Keynes (1936) was one of the pioneering researchers doing research on cash holdings. In his study, Keynes (1936) indicated that there are two main benefits for reserving cash, namely the advantage of lower transaction costs and for precautionary motives. In more detail, Keynes (1936) explained

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that when firms are facing payments or need to raise funds, reserving cash might help to decrease the transaction costs from liquidating assets or getting external funds. Moreover, holding cash also helps to avoid risks from unexpected contingencies. These conclusions were also mentioned in the studies of Baumol, (1952), Miller and Orr (1966), and Myers and Majluf (1984). Accordingly, Miller and Orr (1966) indicated that the holding of cash helps firms reduce brokerage costs. Additionally, Myers and Majluf (1984) believe that due to the problem of asymmetric information, to meet the need of investment opportunities, firms should hold more cash because the cost of raising external funds is higher than using of available cash in the firm. In reality, the decision concerning cash holdings is influenced by the condition of market imperfection, whereby there exist asymmetric information problem, agency conflicts and financial difficulty. The problem of asymmetric information and agency conflicts causes a higher cost of raising funds and also makes investors have more difficulties in accessing funds. Therefore, holding cash helps firms to become more independent in controlling internal funds, mitigating the cost of external financing, and also mitigating the risk of financial distress (Jensen, 1986). Regarding the precautionary motive, the volatility of free cash flows or financial constraints can be a reason to hold cash because it helps to reduce firm risks (Opler et al., 1999, Mikkelson and Partch, 2003). However, in fact, the holding of cash has two faces; a number of studies with empirical results demonstrate that the reserving of high cash levels create more growth opportunities, but is lower in profitability and has a higher volatility of free cash flows (Kim et al., 1998, Opler et al., 1999).

In terms of the determinants of cash holdings, there has been a debate in corporate literature, but most authors follow the trade-off between the marginal costs and benefits of reserving cash in corporate management (Miller and Orr, 1966, Opler et al., 1999, Dittmar et al., 2003, Kalcheva and Lins, 2005, Pinkowitz et al., 2006, Haushalter et al., 2007, Foley et al., 2007, Acharya et al., 2007, Mello et al., 2008, Harford et al., 2008, and Denis and Sibilkov, 2010). Some elements have been determined as influencing cash holdings, including corporate growth perspectives, working capital, leverage, industry volatility, and firm size (Opler et al., 1999), corporate governance (Dittmar et al., 2003, Pinkowitz et al., 2006, and Harford et al., 2008), firm value (Martinez-Sola et al., 2010), taxation (Foley et al., 2007), ownership concentration (Guney et al., 2003), ownership structure (Ozkan and Ozkan (2004), and financial constraint (Denis and Sinilkov, 2010). These factors are

examined carefully and appropriate variables are employed in the empirical models for this chapter.

There are three main theories that used to describe the motivations of holding cash; those are trade-off theory, pecking order theory and free cash flow theory. In terms of trade-off theory, Afza and Adnan (2007) suggest that to achieve the optimal level of cash holdings, firms should examine the trade-off between the marginal costs and marginal benefits of cash reserving. The prior study of Opler et al. (1999) explains that managers tend to hold more cash to mitigate the risks and enhance their cautions, thus maximizing the shareholders' wealth. In addition, the advantages of holding cash are illustrated including minimizing the probability of financial distress, increasing the opportunities of investing projects even when there is a problem of financial constraints, and mitigating the costs of financing from external sources or liquidating assets (Ferreira and Vilela, 2004). For the second theory, according to Myers and Majluf (1984), pecking order theory suggests that the different types of funds should have a different priority order. For example, the retained earnings described should be the prior funds for investments, after that comes issuing debt and finally equity. This order aims at reducing the costs from asymmetric information, and it is believed to be consistent with the purpose of shareholder wealth maximization (Myers and Majluf, 1984). Following that, cash should be held to meet the purpose of using retained earnings for investments. Regarding free cash flow theory, Jensen (1986) states that reserving cash helps to enhance the number of assets under managers' control and creates more opportunities for making investment decisions than does the storage of funds.

The study investigates cash holding decision-making to determine the impact of managerial overconfidence on cash holdings and the impact on the deviation between the actual cash holding level and the optimal cash holding level. The term of cash in this study means cash, equivalents and short-term investment. The findings of this research are investigated in an empirical study of Vietnamese. In fact, while cash holdings studies are neither new nor unique, no one can confirm whether all the necessary factors have been examined in sufficient detail. One of the important factors to have been recently studied is the influence of managerial attributes on corporate decisions. Most of the findings from previous studies have concluded that managerial traits have a significant impact on corporate decisions. This chapter, therefore, focuses on managerial attributes, whereby the key point is examining the effect of overconfident managers on corporate cash holding levels.

Overconfidence might be used to indicate people who normally misjudge themselves in terms of abilities, knowledge and predictions (Ackert and Deaves, 2010). Overconfident people tend to overstate their acumen relative to the average (Larwood and Whittaker, 1977, Svenson, 1981, and Alicke, 1985). Therefore, firms with overconfident managers might have a higher propensity to make aggressive decisions, take more risks and hence lead to unexpected outcomes compared to firms with non-overconfident counterparts.

Managerial overconfidence seems to be an indefinite concept that needs to be measured carefully. In fact, a number of ways have been used to measure this concept in previous studies, such as upwardly-biased forecasts (Lin et al., 2005, Huang et al., 2011), options holding (Lambert et al., 1991, Meulbroek, 2001, Hall and Murphy, 2000, Malmendier and Tate, 2015), executive's relative salary (Malmendier and Tate, 2015), and media coverage (Brown and Sarma, 2007) as well as some other methods. This study employs a very different method, which makes it unique, namely using voice pitch to measure overconfidence. Voice pitch is analysed through recordings collected through direct interviews with 123 top-line managers of Vietnam's non-finance listed firms, which account for 11.94% of the total of 648 non-financial listed firms in Vietnam. Besides voice pitch, the study also uses other methods to measure overconfidence to prevent biased results, namely a psychometric test, which is also conducted through interviews, the size of the CEOs' photos shown in the firms' 2016 annual reports, the average bias in the earnings forecast in the years 2015 and 2016, and finally the gender of CEOs, which is available in firms' annual reports. Moreover, a comprehensive index of overconfidence established from all used measurements is also employed to test the impact of managerial overconfidence on cash holdings.

Research questions

1. *What are the impacts of managerial overconfidence on cash holding levels?*

2. *Do overconfident managers have higher deviations in the target cash holding level?*

The contributions of this study are expected to consist of, firstly, using six different proxies of managerial overconfidence to examine the relationship between managerial overconfidence and cash holdings; those different proxies with different research subjects are believed to minimize the bias in the research results, and also strengthen the findings. Second contribution is the using of a comprehensive measurement of overconfidence from five different proxies to investigate the impact of managerial overconfidence on cash

holdings. Third, employing voice pitch to measure managerial overconfidence is considered as a very new and unique measure for this term. If the result of this proxy is consistent with the other measurements, we can strongly believe that voice pitch is a very good measurement of managerial overconfidence. Most importantly, voice pitch is analysed based on direct interviews with the top-line managers of Vietnamese listed firms, which makes the study becomes very different from other studies. Next, the answer to the second hypothesis question can be seen as a new research result that has not yet been investigated. Finally, other managerial traits are also considered if they have significant impacts on cash holdings.

This chapter is organized as follows. The following part provides a review of the literature, presenting an overview of the motives for and determinants of cash holdings found in previous studies. After that, the methodology section describes the methods used in the research. Next comes the section on the empirical results with the descriptive statistics, correlation matrix and regression analysis. Finally, the findings are analysed and discussed and the conclusions are presented.

2.2. Literature review

2.2.1. Managerial overconfidence: theory, empirical and measurement

2.2.1.1. Definition of overconfidence

There are many definitions of overconfidence in previous studies. Ackert and Deaves (2010), for example, state that overconfidence refers to people who misjudge their abilities and knowledge and also overestimate the precision of their predictions. Additionally, Larwood and Whittaker (1977), Svenson (1981), and Alicke (1985) describe overconfident people as those who normally overstate their acumen relative to the average. From these statements of overconfidence, it is seen that decisions that are made by overconfident people might bring unexpected outcomes, and this not only negatively influences individuals but also influences the surrounding factors (Camerer and Lovallo, 1999). For example, Miller and Ross (1975) state that overconfidence might lead to a too high expectation of obtaining success, thus affecting behaviour and actions, which may lead to bad results. The following section attempts to clarify the terms of overconfidence and managerial overconfidence and then defines them in the most general explanation.

Throughout a number of relevant studies, several terms have been introduced in the prior literature to describe overconfidence, such as miscalibration, the better-than-average effect

and illusion of control (Fischhoff et al., 1977, Taylor and Brown, 1988, Langer, 1975). Regarding miscalibration, Fischhoff et al. (1977) conducted an experiment with a number of questions ranging from easy to extremely difficult and found that overconfident participants can be detected when they answer too confidently about their knowledge during the intermediate and extremely difficult questions. Moreover, Ben-David et al. (2013) measured the miscalibration of senior CEOs by questioning them about their predictions for the future stock market and indicated that overconfident people tend to overpredict the future stock market. In terms of the better-than-average effect, overconfidence is considered to be when a person always believes that they are better than average relating to their abilities and positive personal traits (Taylor and Brown, 1988, Svenson, 1981). For the illusion of control, this indicates people who commonly overestimate their control over events and outcomes. Specifically, even though they know that the events are uncontrollable, they are still confident of positive outcomes, thus leading to uncontrollable results (Langer, 1975).

Excessive optimism and self-attribution bias are also considered as alternative explanation for overconfidence when managers might have biased outcomes or even fail to learn from previous failures and mistakes (Gervais and Odean, 2001, Miller and Ross, 1975, Weinstein, 1980). Moreover, Gervais and Odean (2001) also indicate that overconfidence is when a person normally overestimates their ability and has a wrong interpretation of economic information. Malmendier et al. (2011) define overconfidence as when a person overestimates the mean net income from investments.

Another term commonly used to discuss overconfidence is optimism. Gervais (2010) believes that overconfidence and optimism are indistinguishable and that they can be used interchangeably. This same opinion is also found in the study of Shefrin (2010). Specifically, in order to define the term of optimism in a financial context, Heaton (2002) states that an optimistic manager is one who systematically overestimates the probability of good firm performance while underestimating the probability of a bad one. Hackbarth (2008, 2009) distinguishes optimism as the bias in growth perception and over-predicting the growth rate of return and growth rate of an asset in place. He also explains that overconfidence is a bias in risk perception and an under-predicting of the riskiness of return and the growth rate of an asset in place. Baker and Wurgler (2012) point out that optimistic managers believe in very positive values of assets and investment opportunities.

In general, an overconfident person might overestimate themselves, leading to an overestimation of their decisions. Moore and Healy (2008) have a review of overconfidence definitions in a number of previous relevant studies. They found that about 64% of empirical papers explain overconfidence as when someone overestimates their ability, performance, level of control or outcome. Meanwhile, 31% of empirical papers consider overconfidence as "excessive certainty regarding the accuracy of one's belief". Finally, a small percentage, 5%, considers it using the better-than-average effect.

Generally, managerial overconfidence can be defined as managers who are always too confident about themselves, tend to misjudge their abilities, knowledge, and predictions, also tend to overestimate all events and outcomes, and always believe that they are better than average. Taking everything into consideration, we can state that managerial overconfidence can be associated with unexpected firm performance results due to overconfident managers' identified characteristics. The following section is going to examine the impact of overconfident managers on some aspects of corporate management in more detail.

2.2.1.2. The effect of overconfident managers on corporate financial behaviour

From the previous section, we know that overconfident managers can make aggressive and more risky decisions, which lead to unexpected outcomes in corporate management. Those unexpected outcomes can be failure projects, a decrease in the net present value of projects, an increase in the cost of external financing and the sensitivity of free cash flow of projects. For example, Adam et al. (2015) indicate that overconfident managers might lead to errors in corporate decisions and thus increase the risks to the corporation. Recently, Hribar and Yang (2016) examined the relationship between overconfident CEOs and management forecasting, concluding that overconfident managers normally have a narrower range of predictions and might be more likely to misjudge their forecasts, which would lead to their predictions being out of control. This section, therefore, is going to clarify the effect of managerial overconfidence on corporate financial decisions by reviewing some of the previous literature relevant to this field.

Now, moving on to carefully examining the effect of managerial overconfidence on some particular aspects of corporate management. Firstly, regarding investment projects, according to March and Shapira (1987) and Langer (1975), an overconfident CEO might underestimate an investment project or overestimate investment project profitability

(Malmendier and Tate, 2005), which might then lead to a failure or a worse result than expected. Drawing the same conclusion, Heaton (2002) used a survey to identify and measure optimism and found that optimistic managers with aggressive decisions might lead to a decrease in the positive NPV of projects. Also, Heaton (2002) states that overconfident managers might invest more in riskier projects as they expect higher returns, which might lead to an increase in the cost of external financing and raise their investment sensitivity to free cash flow. Heaton (2002) also believed that overconfident managers think that the market is underestimating their projects. The investing opportunities, therefore, are normally estimated as being overvalued. One interesting finding from the paper by Hirshleifer et al. (2012) is that in innovative industries, firms with overconfident managers are more aware of and invest more in innovation and also obtain success for this; however, this also reveals higher return volatility for these firms.

In terms of capital structure, Malmendier et al. (2008) and Lin et al. (2008) indicate that overconfident CEOs commonly prefer using internal finance to source debt and debt to equity, which might lead to them holding less cash and put firms under liquidity risks (Huang-Meier et al., 2016). Furthermore, Deshmukh et al. (2013) indicate that overconfident CEOs think external financing is costly and pay more attention to retained earnings for future investment. Also, Ahmed and Duellman (2013) and Malmendier et al. (2013) used measurable managerial characteristics to determine the point that overconfident managers adopt less equity and less external sources than their peers. Graham et al. (2013) conclude that more optimistic CEOs tend to use more short-term debt. Similarly, the most recent paper by Huang et al. (2016) also states that overconfident CEOs tend to use an aggressive capital policy, which means that more short-term capital sources are used in the capital structure.

For other corporate management aspects, such as dividend policy, share repurchase, and acquisitions, it is also found that managerial overconfidence tends to have riskier decisions. For example, according to Deshmukh et al. (2013), an overconfident CEO might use a tight policy in dividends, because they prefer using retained earnings for investments, as mentioned above. From another aspect, Shu et al. (2013) revealed a positive significant relationship between overconfident CEOs and share repurchase because they think that their share value is undervalued, hence they make more transactions of share repurchase. In terms of acquisitions, Graham et al. (2013) found that more risk-tolerant CEOs tend to have

more acquisitions than their other counterparts.

From a number of previous papers, it becomes clear that overconfident managers have different behaviours in their firms compared to their non-overconfident peers. Such different behaviours might lead to different results in firm performance. Therefore, in order to analyse the behaviour of companies, it is necessary to analyse the behaviour of managers who have the most power in the management of any company. That means that investigating the impact of overconfident managers on cash holdings is a necessary study.

In terms of cash holdings, there have been no papers directly investigating the impact of managerial overconfidence on cash holdings, but several studies have mentioned this relationship in indirect approaches, such as Malmendier and Tate (2008) and Malmendier et al. (2011). According to Malmendier and Tate (2008), overconfident managers have a higher propensity to use cash and debt for acquisition purposes. A further research of Malmendier et al. (2011) stresses that there is a difference in choosing cash financing between overconfident managers and non-overconfident counterparts. Accordingly, overconfident managers prefer using cash compared to non-overconfident managers.

In conclusion, from a review of the definitions of managerial overconfidence and the effects of managerial overconfidence on corporate management, especially on cash holdings even though this was approached in an indirect way, we believe that overconfident managers also have a significant impact on cash holdings. Specifically, overconfident managers with more aggressive decisions might aim to use more internal capital for investments and hence tend to hold less cash. The preference for holding less cash can also lead to a higher deviation between the actual cash holding level and the optimal cash holding level. Therefore, we set up the two main hypotheses for the study as follows.

Research hypothesis

H2.1: Firms with overconfident managers hold less cash

H2.2: Overconfident managers is associated with a higher deviation in the target cash holding level

To test the two main hypotheses, we investigate the other determinants of cash holdings in the next sections and then finally produce the main models for the study.

2.2.2. The determinants of cash holdings

2.2.2.1. The theory of cash holdings

2.2.2.1.1. Why hold cash?

One of the pioneering researchers to study cash holdings was Keynes. In his research in 1936, he stated that there were three motives for cash holdings, related to demands for transaction, precautionary motive and speculation. He also proved that the transaction demand for money stemmed from the transaction and precautionary demand, while the interest rate was a major factor affecting the decision to hold less cash. Following the research of Keynes, a number of researchers focused on the precautionary motive and transaction motive to develop their studies of cash holding management, such as Baumol (1952), Tobin (1958), Frazer (1964), Whalen (1965, 1966), Miller and Orr (1966), and Frenkel and Jovanovic (1980).

Based on the study of Keynes, Baumol (1952) constructed a model of cash management by analysing the transaction motive. He also used the model of managing inventory to develop his model in terms of the physical inventory of assets. The findings in Baumol's study indicated that holding cash, and then exchanging it for other kinds of assets at appropriate times, helps to minimize a firm's transaction costs.

Tobin (1956) also developed a study investigating cash holding management based on the term transaction, and he came to the same conclusion as Keynes that the decision relating to cash holdings mainly depends on the interest rate. Two years later, this author continued to conduct research in this field and reached a different conclusion, namely that the relationship between the interest rate and the transaction motive is independent or uncertain, but that the cash holding decision is still based on the interest rate.

Frazer (1964) stated that when the firm size increases, the cash holding level might decrease under the effect of precautionary action. This is because the firm size increase means that the assets or the wealth of firm also increases, which helps to reduce the bank debt as a percentage of assets, weakening the precautionary motive for holding cash and transferring cash as a percentage of assets to securities. Accordingly, the author supports the fact that the precautionary motive plays a very important role in the demand for cash. Another study by Whalen (1965) showed that there was a gap in the research of Tobin, whereby this scholar merely focused on the transaction motive but ignored precautionary and liquidity preference in analysing the behaviour regarding cash holding decisions.

Building on the research by Keynes in terms of the precautionary motive, Whalen (1966) stated that firms hold cash to use it for unexpected situations, such as uncertainty in future expenditure that might exceed the future returns. This author also identified the optimal precautionary cash balance and the factors that affect it. These factors are, firstly, the cost of illiquidity relevant to the cash balance, which that makes a firm's debt get out of control, leading to a higher cost of using capital or even unexpected bankruptcy. The second factor is the opportunity cost of holding cash. In fact, holding cash does not generate any return, therefore, instead of holding too much cash, firms might invest the cash in other types of asset to earn more money. That means that holding a balanced cash level might increase the firm's opportunity cost. The final factor is the prediction of the expenditure and the future return as its variation. When the estimated risk is high, the cash holding level must also be high in order to meet unexpected circumstances.

In terms of the precautionary demand, Sprenkle (1967) had a different finding, demonstrating that there is a negative relationship between uncertainty and the precautionary demand for liquidity. Sprenkle used empirical analysis to determine that large firms tend to hold less cash with uncertainty. Instead, they use short-term securities as an alternative to liquid assets. The author also explains that uncertainty might lead to an overestimation from investors in terms of short-term securities. Hence, using short-term securities as an alternative to cash liquidity might be a better decision with a higher return compared to just holding cash. Frenkel and Jovanovic (1980) used both precautionary and transaction demand to analyse the cash holding decision. These two scholars based their research on the previous studies of Baumol (1952), Tobin (1956) and Miller and Orr (1966) to determine the optimal cash holding level. Accordingly, some factors are identified as being determinants of the optimal cash level, including interest rate, the average rate of net expenditure and its standard deviation, and the adjusted firm's portfolio cost.

2.2.2.1.2. Trade-off theory

Trade-off theory examines firm value maximization by examining the trade-off between the marginal costs and the marginal benefits of cash holdings. The costs of holding cash can be the difference between the earnings from reserving cash and the costs which firms have to pay for raising additional funds. In fact, holding cash might help to minimize transaction costs and satisfy the precautionary demand (Dittmar et al., 2003, Miller and Orr, 1966, Tobin, 1956). The minimization of transaction costs is represented by the conclusion of

Ozkan and Ozkan (2004), whereby they state that holding cash can provide more internal sources of financing and prevent the higher cost from external financing. For the precautionary motive, Ferreira and Vilela (2004) indicate that raising cash holdings might minimize unexpected losses from unexpected financial distress. When investigating emerging markets, Al-Najjar (2011) and Booth et al. (2001) demonstrated that corporations might have more investment opportunities when they hold more cash because the market is imperfect and it, therefore, might be difficult to raise funds immediately when they are needed.

2.2.2.1.3. Pecking order theory

This theory states that the optimal level of cash holdings does not exist. The pecking order theory outlines the order of funds, going from internal sources to external sources and aiming to minimize costs relevant to information asymmetry (Myers, 1984, Myers and Majluf, 1984). Myers (1984) also suggested that corporations prefer debt to equity when drawing funds from external sources. Accordingly, cash is the result of the different order of financing and is used for investments, paying debts or distributing dividends (Dittmar et al., 2003, Ferreira and Vilela, 2004). In fact, according to pecking order theory, the retained earnings described should be the prior funds for investments, followed by debt and finally equity. This order aims at reducing the costs from the problem of asymmetric information, and it is believed to be consistent with the purpose of shareholder wealth maximization (Myers and Majluf, 1984). Therefore, cash should be held more to meet the purpose of using retained earnings for investments.

2.2.2.1.4. Free cash flow theory

Jensen (1986) states that reserving cash helps to enhance the amount of assets under managers' control and also helps managers get more discretionary power in making investing decisions. Jensen (1986) also stresses that the storage of cash helps firms gain the initiative in raising funds when there are opportunities for investing. Accordingly, the cash holdings can help to achieve the shareholder wealth maximization objective.

2.2.2.2. Determinants of cash holdings – empirical works

In terms of cash holding theory, although it was first mentioned early on, it wasn't until the late 1990s that studies began investigating the determinants of cash holdings. One of the first studies that created a first significant step for subsequent studies was Opler et al. (1999). Although there had been a small number of scholars doing research in this field

before them, Opler et al. (1999) seem to have been the most significant. Until now, an enormous number of studies have attempted to determine the determinants of cash holdings. In the next section, a significant number of the previous papers are discussed to define the gap that this study intends to fill while attempting to examine the cash holding decision from a new aspect.

Kim et al. (1998) were among the first researchers to determine the factors affecting the cash holding level in corporate management, using a 20-year period between 1975 and 1994 with 915 companies to conduct their research. The research aimed to construct an optimal model for a firm's level of liquidity assets, which used explanatory variables such as firm size, growth opportunities (estimated by market to book ratio), cash flow and its variations, return spread between physical assets and risk-free assets, cash conversion cycle and its variations, debt ratio, and bankruptcy estimation. The research found that if it is expensive to finance from external sources or when the company recognizes that they will have a big return from future investments, the firm tends to hold more liquid assets. The market to book ratio and future economic conditions also have the same movement regarding liquid assets. In contrast, firms hold less liquid assets when the difference between the rate of return on physical assets and liquid assets is relatively high. Furthermore, the same sign also appeared for firm size. In terms of firm size, Schnure (1998) similarly produced the result that the ratio of cash to total assets has a negative relationship with firm size. Furthermore, the low variability of cash flow and economies of scale or the ability to easily access the financial market might make a firm hold less cash, while there is a positive relationship between cash holdings and agency problems, the ability to issue stocks and acquisition disbursement.

Opler et al. (1999) used the ratio of cash to assets, whereby assets were defined as total assets minus cash and marketable securities as the proxy of cash holdings to determine what factors indicate the level of cash holdings. Before running the model with some variables, the scholars based themselves on the transaction motive from Keynes (1936) and assumed that there are costs to acquire and discard financial and real assets. Accordingly, they constructed a figure which represented the optimal level of holding cash, namely the intersection between the marginal cost of the liquid asset curve and the marginal cost of the liquid asset shortage curve. They state that the greater the shortage, the higher the costs. The research findings of these authors indicate that when the company has more growth

opportunities or higher volatility in cash flow, it may tend to have a high ratio of cash holdings. However, the negative relationship is determined by the firm size, especially for firms that have a high reputation and can easily access the capital market, while dividends are also found to have a negative effect on cash holdings, which is also consistent with the previous research. Opler et al. (1999) also indicated that managerial ownership has a positive impact on cash holdings and that it can help to decrease the conflict of interest between managers and shareholders. Another finding shows that holding cash leads to a low return and tax disadvantages, but there is an advantage in the lower transaction cost. Moreover, cash can be used for future investment and can help avoid the higher cost of external financing or the rise of unexpected situations. Finally, Opler et al. (1999) proved that there is an agency problem existing in cash holding decisions because managers tend to hold more cash as a precaution and to minimize risks and are not really too concerned with maximizing shareholder wealth.

Faulkender (2002) used aspects related to financial distress, information asymmetry, taxes and agency cost to examine the cash holding level of small companies. The findings indicate that when a company has high leverage, it tends to hold more cash to reduce risk. Further, older companies and companies with better market information normally hold more cash. The same movement of higher cash also occurs in firms with high costs of financial distress, and this finding is in agreement with the previous paper published by this scholar in 2000. Firm size is once more proved to have a negative relationship with the cash holding level. Meanwhile, tax has no effect on the cash level in firms. There are different results from Omet and Maghyereh (2003), who indicate that leverage is significantly negatively related with cash holdings, while also stating that there is no relationship between firm size, growth opportunity and profitability, and the cash holdings of firms. Using several similar variables from previous studies, Ferreira and Vilela (2004) came to the same conclusion as the research of Opler et al. (1999), stating that investment opportunities positively influenced cash holding determination. The same can be found for most findings, indicating that leverage and firm size negatively affect cash holdings. The same negative influence is found for the variables of asset substitutes, bank debt and the development level of the financial markets. In terms of free cash flow (FCF), Ferreira and Vilela (2004) showed a contradictory conclusion with the theory of FCF when finding a negative movement between these two variables. Moreover, they also demonstrated that

their findings were consistent with pecking order theory and trade-off theory.

In addition, factors that have a positive effect on cash holdings are discussed. Faulkender (2002) conducted a survey of 2,808 US firms in 1993 and concluded that cash holdings has a positive relationship with financial distress, leverage and firm age. With 79,932 US firm-quarter observations from 1996 to 2010, Acharya et al. (2012) showed that there is a positive correlation between cash holdings with credit spreads and the longer-term probability of default. Hence, riskier firms tend to have a greater cash balance. According to Ghaly et al. (2015), who examined 3,000 US companies from 2003 to 2009, in firms with better employee wellbeing, the cash holding trend is also higher. Brown and Petersen (2011) indicated that firms with little access to financing sources tended to hold more cash to smoothen the R&D process. For repurchasing firms, there is a trend of holding large amounts of cash (Lee and Suh, 2011). In the study by Bigelli and Sánchez-Vidal (2012), the authors indicated that there is a significant relationship between cash holdings and firm size, firm risk and tax rates. Moreover, bank debt and NWC can be efficient alternatives for cash. When investigating the relationship between cash holdings and financial constraints and investment, Denis and Sibilkov (2010) demonstrated that a larger level of investment for constrained companies leads to a higher level of cash holdings. The research by Ferreira (2004) also had the same statement regarding investment opportunities. Showing the same positive association with cash holdings, Liu et al. (2014) recognized several variables, such as the tenure of CEOs, inside debt and firm leverage. They also indicated that for CEOs with more years working closely with firms, the level of cash holdings seems to decrease. Chen et al. (2015) found several points indicating that there is a positive relationship between cash and the uncertainty avoidance of firms. In another approach considering the relationship with technology spillover, Qiu and Wan (2015) showed that companies that have a higher technology spillover hold more cash. With time series and cross-section tests, Opler et al. (1999) indicated that firms with growth opportunities and riskier cash tend to hold more cash. Furthermore, during a study in Japan, Germany and the US using panel data from 1971 to 1995, Pinkowitz and Williamson (2001) recognized that Japanese corporations tend to hold more cash than German and US corporations. These scholars also stated that the monopoly power of banks is highly associated with the cash holding level in firms. Accordingly, stronger banks might lead to higher cash holdings. Al-Najjar (2011) recognized that there is a relationship between cash policy and capital structure and

dividend policy. According to Opler et al. (1999), firms that pay dividends tend to hold less cash due to the use of internal funds at a lower cost compared to other capital sources. The relationship of dividends with cash holdings is investigated in other studies, showing the same results, such as the research by Lin et al. (2010), Al-Najjar (2013) and Bigelli and Sánchez-Vidal (2012).

Moving on to discuss the factors negatively impacting cash holdings. Budin and Handel (1975) used data from 42 larger corporations from 1947 to 1968 and found that firms hold less cash when the interest rate increases. Guney et al. (2003) researched 3,989 companies from Japan, France, Germany and the UK using cross-sectional, static fixed effects and dynamic panel data, indicating that the legal structure of a country, as well as the ownership structure of companies, has a significant relationship with cash holdings. Moreover, the paper showed that a lower degree of stockholder protection would lead to a higher cash holding level. Locorotondo et al. (2014) demonstrated that financially distressed firms decrease their cash holdings. Furthermore, the authors indicated that non-affiliated companies hold more cash than affiliated firms. Faleye (2004) conducted a study among US firms in 1988-2000, indicating that in a strong takeover market, there is a lower cash holding level. From another aspect, a short-term bank could be seen as an effective alternative source of funds for cash. Therefore, a higher number of short-term banks might lead to a lower level of cash holdings (Kling et al., 2014). Similarly, Garcia-Teruel and Martinez-Solano (2008) and Ferreira (2004) showed that firms that use more banking debt hold less cash. Bigelli and Sánchez-Vidal (2012) showed that longer CCCs lead to a lower cash balance and lower financing deficits, leading to higher cash holding. For diversified firms, the trend also seems to be less cash holding; this is the conclusion from the research of Subramaniam et al. (2010). In another approach, Chen et al. (2015) indicated that cash holdings negatively correlates with individualism or with unionization (Klasa et al., 2009). Further, Harford et al. (2014) state that refinancing risk is a key determinant of cash holdings, whereby to minimize refinancing risk, the firms raise cash. Kusnadi and Wei (2011) showed that legal protection has a first-order impact on the cash policy of international companies.

According to Kuan et al. (2011), there is a difference in cash holdings between family-controlled firms and non-family-controlled firms. This research was based on 1,164 firms in Taiwan in 1997-2008. The difference in cash holdings also occurred between privately

held firms and publicly traded firms (Hall et al., 2014). In comparison, in a study among provinces in China, Kusnadi et al. (2015) indicated that non-state-controlled companies normally hold more cash than others, and as state ownership decreases, cash holdings increases for Chinese firms (Megginson and Wei, 2014, Chen et al., 2012).

2.3. Methodology

2.3.1. Research design

2.3.1.1. Sample selection and data sources

Most previous studies used secondary data to conduct research and investigate the relationship between cash holdings and other variables. In this study, data were collected through direct interviews with 123 top managers of Vietnam's listed companies to measure the variables of managerial overconfidence and other attributes. The interviews used both closed-ended questions and open-ended questions to ask the top managers of Vietnamese companies. The closed-ended questions were used to evaluate the overconfidence of managers through psychometric questions, while the open-ended questions were used to ask about relevant issues to collect the voice pitch of the managers.

Secondly, secondary data were taken from DataStream, and the annual reports of companies were collected to create different proxies for other overconfidence measurements and other control variables in the research models.

2.3.1.2. Data collection

The research sample of this study comprises three different sample sizes. One is collected from interviews, and the second and the third sample size are extended from all 648 Vietnam non-finance listed firms.

For the sub-sample data, 123 non-finance listed firms on the Vietnam stock exchange market were targeted, which were collected randomly from all 648 firms. The most important data type of the sub-sample size is the interviews from 123 top-line managers of Vietnamese non-finance listed firms. Moreover, all relevant data of these companies are also collected for other relevant variables in empirical models. More specifically, emails and phone calls were sent, asking for participants in the research, whereby 424 listed companies were contacted. However, there were only 123 responses and 5 companies refused to allow the recording of the interviews, which equals an 18.98% sampling of the population of 648 non-finance listed companies. Specifically, there are 19 CEOs, whereby 4 are both CEO and chairmen, 73 CAOs, of which 3 are CAOs and also vice executive

director, 8 CFOs, and 23 vice executive directors. For the 72 companies with 72 CAOs, these companies do not have chief financial officers, hence, CAOs can be seen as playing the role similar to CFOs. The interviews were conducted over two periods; one was from February to May 2017 with 79 interviews were conducted and the other was from October 2017 to February 2018 with the rest of 44 interviews were conducted. Most of the interviews were conducted at the working place of the managers, while some were conducted at the annual conference for listed companies on the Hanoi Stock Exchange market organized at the beginning of October 2017 and few number were held in other places such as homes and cafés. All interviewees worked in the firms at least since the beginning of 2016 due to the data of dependent variable, and the other independent variables except the data of managerial attributes were collected in 2016 for the sub-sample size.

For the extended sample size and other data needed for the sub-sample size, all necessary data were primarily collected from Thomson Reuter EIKON and hand-collected from the annual reports of companies.

2.3.2. Measurement of manager's overconfidence

2.3.2.1. Overconfidence measurement from previous studies

To examine the effect of overconfidence and optimism on corporate management, it is necessary to understand how to measure overconfidence. This part briefly discusses a number of previous empirical studies to identify the best way to measure overconfidence and optimism, which is an alternative term for overconfidence in this study.

Lin et al. (2005) based their study on a personal basis to measure optimistic CEOs. Accordingly, they focused on results showing upwardly-biased forecasts and believed that an optimistic manager might have more upwardly-biased forecasts than downwardly-biased forecasts during the manager's term, and hence more upwardly-biased forecasts can be representative of optimistic managers. In the financial literature, the most popular measurement for overconfidence is the holding of options. Malmendier and Tate (2005) explain that options and stock are granted to CEOs as their compensation, therefore these securities cannot be traded as short selling corporate shares to minimize their risk. And because holding options might reduce the diversification portfolio, CEOs are considered to be risk averse and not hold options for a long time, and they might exercise their stock when they think it is sufficiently high (Lambert et al., 1991, Meulbroek, 2001, Hall and

Murphy, 2000). Based on their research in 2005, Malmendier and Tate (2015) continued to investigate the role of managerial overconfidence in corporate behaviour and used the same method to measure overconfidence. They also carefully explained that stock options are untradeable and it normally takes years to obtain a return before these stock options can be exercised to purchase and sell the underlying shares. Therefore, they believe that risk-averse executives want to exercise stock options soon to diversify their portfolios. In the studies by these scholars, the term "longholder" is used to refer to overconfidence. Doukas and Petmezas (2007) further developed the study by Malmendier and Tate (2005) when researching the effect of overconfident CEOs and self-attribution bias on acquisition behaviour. They argue that the measurement by Malmendier and Tate (2005) is impossible in the UK market. They indicate that there is a drawback to Malmendier and Tate's research when measuring overconfidence in that managers might delay the exercising as they are in the money of the options. Accordingly, Doukas and Petmezas (2007) used the idea from the study of Goel and Thakor (2008) to measure overconfidence. The idea is that overconfidence promotes the chances of succeeding in contests.

Huang et al. (2011) introduced two proxies to measure overconfidence. First, they used the bias in forecasted earnings and actual earnings. According to Huang et al. (2011), an overconfident manager might have more occasions of over-forecasting during the period of their management terms. This proxy was also developed previously in the study of Lin et al. (2005). Secondly, Huang et al. (2011) based their study on the executive's relative salary to measure overconfidence. According to Hayward and Hambrick (1997), the higher the relative salary of a manager, the higher the relative position they have and hence they are more powerful (Sivanathan and Galinsky, 2007). More power might lead to the illusion of control (Rudski, 2004), and therefore lead to an overconfident CEO.

Hirshleifer et al. (2012) used two proxies to measure overconfidence; one of these was developed based on Malmendier and Tate (2005, 2008), namely stock options. The second measurement was the press-based measure. For the press-based measure of manager overconfidence, they used several keywords such as confident, confidence, optimistic, optimism, over-optimism, over-optimistic, pessimistic, pessimism, reliable, and steady, these are searched from well-known articles referring to CEOs in such publications as The New York Times, BusinessWeek, Financial Times, The Wall Street Journal, The Economist, Fortune, and Forbes. Accordingly, for each manager and each year, these

authors recorded all those necessary keywords using the available unique company code in Factiva and searched for the word "CEO". Similarly, Shu et al. (2013) and Hribar and Yang (2016) used the two terms of over-optimism and miscalibration to represent overconfidence and used both options-based and press-based measures for the proxy of overconfidence. Hsieh et al. (2014) chose the options-based measure for overconfidence. The term miscalibration is also used as a term to both describe and measure overconfidence in several studies. Ben-David et al. (2013) used prediction about the future stock market from senior financial managers to measure their confidence level.

Brown and Sarma (2007) used media coverage to estimate overconfidence. Accordingly, to identify overconfident managers, they collected data by examining how the leading press in Australia portrayed each individual executive over the sample period. The collection process is based on the Five Factor Model (Goldberg, 1999, McCrae and John, 1992, and Costa and McCrae, 1992) with the five factors of openness, conscientiousness, extroversion, agreeableness, and neuroticism. Ahmed and Duellman (2013) used four ways to measure overconfidence, whereby the first was based on the options holding from the research of Malmendier and Tate (2005, 2008). The second measure was based on Malmendier and Tate (2005) and used the net purchases by the executive to recognize overconfident CEOs. Next, the investment measure of overconfidence was introduced. The two scholars stated that company investment is affected by CEO overconfidence (Malmendier and Tate, 2005, 2008, Ben-David et al., 2013). Therefore, they used an investment-based proxy for overconfidence, which means that, according to Ahmed and Duellman (2013), overconfident CEOs can have a larger capital expenditure. Another proxy based on investment uses the excess investment in assets from the residual of the regression of total asset growth on sales growths run by industry-year. Similar to previous studies, Ting et al. (2016) used three ways, including holding options (Deshmukh et al., 2013, Chen and Ma, 2011, Malmendier and Tate, 2005, 2008), media coverage (Brown and Sarma 2007) and bias in earnings forecasts (Huang and Kisgen, 2013, Huang et al., 2011, Hilary and Hsu, 2011, Lin et al., 2005) as a proxy for overconfidence.

Graham et al. (2013) constructed a number of psychometric questions to identify people who were risk-averse, had a time preference, had an aversion to sure losses or were optimistic. The same method of using psychometric test can also be found in the research of Scheier et al. (1994). In this research, a number of questions are also constructed and put to

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the participants to identify the confidence level. According to Schrand and Zechman (2012), overconfidence can also be measured by the visibility of the CEO's photograph in the firm's annual reports. Accordingly, a higher confidence level is identified by a greater size of CEOs' photographs appearing in annual reports. From a different viewpoint, overconfidence is measured by the gender of managers (Yang and Zhu, 2016, Mishra and Metilda, 2015, Huang and Kisgen, 2013). In these studies, female managers are found to be normally more overconfident than male managers. However, in the research of Hardies et al. (2009), there is no difference between male and female in terms of the overconfidence level. Even though there is a conflict in the use of gender to measure overconfidence, the majority of gender and overconfidence studies believe that females tend to be less overconfident than males. So, it also can be seen as an alternative measurement for overconfidence.

From this short review of overconfidence and optimism measurement, it is seen that there are several ways to estimate overconfidence and optimism. Of those, stock options can be seen as a good and popular way to measure overconfident managers, as a significant number of researchers have used this measure. However, as it is very young, Vietnam's stock market is only in the first steps of developing the application of options. Meanwhile, options are still quite new in Vietnam, therefore, there is no value in using them to measure overconfident managers in this study. Other measures, such as the executive's relative salary, press-based, and media coverage, which seem to be popular in many previous studies, are also not available when applied in the context of Vietnam. Specifically, the data of the executive's relative salary of Vietnam's firms is not available in any source of database, even in firms' annual reports. Regarding press-based and media coverage, it is also very hard to collect from orthodox and reliable sources in Vietnam. Therefore, we ignore the measurement of overconfidence from those indexes.

To sum up, in this chapter, there are six appropriate methods that make the study different in that it measures overconfident managers through an analysis of voice pitch, performs a psychometric test for managers, examines the visibility of CEOs' photograph in annual reports, the bias in earnings forecast and gives the gender of managers, and the comprehensive index constructed by five prior proxies. For the voice pitch analysis, the most important factor to make this research become unique is that a large number of direct interviews were carried out, and the study used the Praats software to evaluate the voices of

managers in recordings of direct interviews and from this determines which were overconfident managers. The reason for using voice pitch to measure overconfidence stems from a number of previous studies relating to the effect of different voice pitch leading to different outcomes. In particular, the analysis of the effect of vocal pitch or tone of voice on relevant aspects of corporate behaviour has been examined carefully by a number of scholars, such as Hobson et al. (2012), who showed that vocal dissonance has a positive impact on financial misreporting, Davis et al. (2012), who found that the tone in conference calls has a significant relationship with managerial style, and Elkins et al. (2012), who stated that the human voice can be used as a carrier of alerting and emotional messages. Furthermore, a change of tone by managers might also give an indication of the strength of a company's information environment (Feldman et al., 2010). The study by Feldman et al. (2010) additionally indicated that the management's change of tone could help to predict the drift return. In another study from Mayew and Venkatachalam (2012), the power of voice was analysed to predict the future earnings of a firm. In other areas, such as psychology research, Gamer et al. (2006) used vocal measures to detect guilty and innocent participants. From those studies, it can be stated that voice pitch is a very good measure for overconfidence in this study, which examines its relationship to corporate behaviours.

In terms of the psychometric test, it is based mainly on the paper of Graham et al. (2013), whereby the researchers constructed a list of questions to be asked during the interviews to measure both relevant terms and overconfidence. The structure of the interviews is presented in the methodology section. In terms of the visibility of photographs shown in annual reports, all 2016 annual reports for both the small sample size and larger sample size were checked manually. For the next proxies of overconfidence, the bias in the earnings forecast was also collected manually in all the firm's annual reports. The last proxy of manager's gender was collected through companies' profiles.

Furthermore, a comprehensive index is also constructed from the data of voice pitch, psychometric test, the visibility of CEOs' photos in annual reports, bias in earnings forecast, and manager's gender. The comprehensive index is expected to produce the same regression result and support for the findings from each individual regression model of each individual measurement of overconfidence. All proxies are explained in detail in the following section.

2.3.2.2. Measurement of managerial overconfidence and other traits of managers for this study

There are a number of ways to measure overconfident managers, such as using holding options (Malmendier and Tate, 2005, 2008), the difference in the result between pro forma income statement and actual earnings (Lin et al., 2005, Huang et al., 2011), the current performance of companies (Hayward and Hambrick, 1997), and media coverage (Hayward and Hambrick, 1997, Malmendier and Tate, 2008, Brown and Sarma, 2006, Hribar and Yang, 2016). However, due to the short operational duration of the Vietnamese stock market and the unpopular recognition in terms of options and other measures, which was used widely in previous papers, this study develops five proxies that are believed to be appropriate and feasible to estimate the overconfidence of managers in Vietnam's companies. In addition, besides the using of these five proxies, the comprehensive index is also introduced. Five different ways and the comprehensive index to measure overconfident managers are used to prevent bias in the research. If all of them reveal the same empirical results, the reliability of this research becomes more confident. The five proxies and the comprehensive index are mentioned in more detail in the following part.

The most important proxy, and the one that makes the research unique, is the use of voice pitch to measure the overconfidence of CEOs. According to the research of Dabbs and Mallinger (1999), high testosterone levels predict a low voice pitch in men, while they are also thought to be related to risk-taking behaviour (Sapienza et al., 2009, Stenstrom et al., 2011), especially taking more risks in financial decision-making (Apicella et al., 2008). In more detail, according to Sapienza et al., 2009 and Stenstrom et al., 2011, people, especially men who have high testosterone normally tend to take riskier decisions than others. Moreover, high testosterone men were recognized as men with low voice pitch (Dabbs and Mallinger, 1999). Hence, there can be an evidence to state that there is a relationship between voice pitch and risk-taking behaviours. Further, higher risk-taking has been shown to be influenced by a higher level of overconfidence (Menkhoff et al., 2006). Therefore, voice pitch is used as an appropriate proxy to measure overconfident managers in this study. The voice pitch was collected through interviews with 123 top managers of Vietnamese firms, including chief executive officers (CEOs), chief financial officers (CFOs), chief accounting officers (CAOs), and vice executive directors of the interviewed companies.

As the higher the voice pitch, the lower the testosterone level, there are assumed to be lower levels of confidence in people with are high voice pitch. In this research, voice pitch ranges from 0 to 300 F_0 in Hz (F_0 in Hz – the measurement of voice pitch), therefore, to simplify, 100 is divided by voice pitch to make it more appropriate, and we term it "voice pitch adjustment" as one of the two main variables to measure overconfidence. Specifically, the higher the voice pitch adjustment, the greater the overconfidence, and this is represented as follows.

$$\textit{Voice pitch adjustment = 100/ Voice Pitch}$$

The questions used to ask managers were general questions related to cash holdings decision-making, debt maturity, merger and acquisitions, and are given in the following. Note that the interviewees were free to choose whether or not to answer the questions.

Question 1: What are your benchmark decisions relating to cash holdings and debt maturity?
Question 2: Do you believe cash holdings will impact firm performance? If yes, explain why.
Question 3: Do you believe debt maturity has an effect on firm performance? If yes, explain why.
Question 4: Do you evaluate your company/compare your company to your competitors? Who are your company's competitors?
Question 5: What is your opinion about acquisition? What do you think about any acquisition in the future of your company?
How many acquisitions have there been in your company since you were CEO?
Question 6: What do you think about the future economy of Vietnam, for example in the next 10 years?
Question 7: What do you think of the investment opportunities in your company's industry?

The second proxy was collected from a psychometric test that was developed based on the studies by Graham et al. (2013) and Scheier et al. (1994). The psychometric test was collected through a number of questions in interviews with 73 top managers. There were four questions that aimed to ask top managers questions in terms of their behaviour in some events of daily life and the corporate context. From these questions, risk-averse, myopic, overconfident managers were identified. Each answer was marked, and the more points the respondents had, the more overconfident they were. Specifically, as explained by Menkhoff

et al. (2006), overconfident managers tend to take higher risks, hence, the questions asking about risk aversion are designed as two questions, as in the following.

Question 1a:
"Assuming that total value of **all** your assets is 1 million dollars, you are offered two investment projects that require 1 million dollars for the initial investment. Which project would you prefer?
- Project 1: 100% creating NPV equalling 1.3 million dollars in 3 years
- Project 2: 70% creating NPV of 10 million dollars in 3 years, but with 30% getting a total loss.

If the respondent picked project 2, the survey continued to ask question 1.b. If not, it went to question 2.

Question 1.b:
Assuming that the total value of **all** your assets is 1 million dollars, you are offered two investment projects that require 1 million dollars for the initial investment. Which project would you prefer?
- Project 1: 100% creating NPV equalling 1.3 million dollars in 3 years
- Project 2: 50% creating NPV of 20 million dollars in 3 years, but with 50% getting a total loss.

If the respondents chose project 1 for the first question, they received 1 point. If they chose project 2, they received 2 points. If they moved to question 1.b and they chose project 1, they received no point and if they choose project 2, they received an extra 2 points due to a much higher risk.

Question 2 was constructed following the measurement of optimism concept of Graham et al. (2013). In this study, the concept of optimism is considered similarly to the concept of overconfidence. Therefore, the same questions were asked of the respondents, as follows.

Question 2:
1. In uncertain times, I usually expect the best.
2. If something can go wrong for me, it will.
3. I'm always optimistic about my future.
4. I hardly ever expect things to go my way.
5. I rarely count on good things happening to me.
6. Overall, I expect more goods things to happen to me than bad.

Question	1	2	3	4	5	6
I agree a lot						
I agree a little						
I neither agree nor disagree						
I disagree a little						
I disagree a lot						

For question 2, sections 1, 3, 5, 6 are marked as 2.5, 2, 1.5, 1 and 0.5 equivalent to "I agree

a lot", "I agree a little", "I neither agree nor disagree", "I disagree a little", "I disagree a lot", respectively. In contrast, for sections 2 and 4, the marks are 0.5, 1, 1.5, 2 and 2.5 for "I agree a lot", "I agree a little", "I neither agree nor disagree", "I disagree a little", "I disagree a lot", respectively.

Question 3 was used to ask about managerial myopia. Overconfident CEOs tend to have long-term sight or long-term strategies (Ridge et al., 2014), therefore, if they are more overconfident, they might choose the answer with long-term sight and not the certain one in the short term. Question 3 was structured as follows.

> ***Question 3.a:***
> If you had an inheritance of $100,000, would you prefer to have it now
> with $100,000 or receive it as $140,000 one year from now?
> 1.   Get it now with $100,000
> 2.   Have $140,000 after one year
> If the respondent chooses 1, please move to question 3.b; if not, move to
> question 4.
> ***Question 3.b:***
> What will you do with the $100,000 you receive today?
> 1.   Keep it in a cash vault or deposit it in a bank account as savings
> 2.   Invest the money today and expect higher interest

For question 3.a, if the respondents chose to receive the inheritance now, they received 1 point; if they chose to have it, later on, they received 2 points. For question 3.b, if they chose 1, they got no extra point due to over-caution; if they chose 2, they received an extra 1 point for more confidence.

Question 4 is also a question that tests the risk-taking of managers. It was designed to examine the aversion to sure losses with the case as follows.

> ***Question 4:***
> As a financial analyst, if your best friend came to ask you for advice, what
> would you advise him about his situation?
> Last year, his company invested $5 million in a project that was expected to
> generate cash flows of $10 million after one year. A year has passed and the
> project has yielded nothing.
> Now your friend has the opportunity to invest an additional sum in this same
> project. There is a 20% chance that the project will generate a $10 million
> cash flow in a year's time and nothing thereafter. There is an 80% chance
> that the new investment will generate nothing at all. How should your friend
> do now?

1. Continue to invest extra $2 million US dollars to get the chance.	
2. Stop the project	

If the respondents chose 1, they received 2 points, if they chose 2, they received 1 point.

In the psychometric test, the total points were calculated and the higher the points, the more overconfident the managers were. The points calculated for the psychometric test were subsequently transformed to logarithm form to have a better fit for the regression models.

Regarding the third proxy of overconfidence, all related firms' annual reports are checked and, finally, the level of overconfidence is identified through the size of the CEOs' photographs appearing in annual reports. Following the paper of Schrand and Zechman (2012), the points for CEO overconfidence in this research is represented as 4, 3, 2, and 1. To be more specific, 4 is if the CEO photograph takes up at least half a page, 3 is if the photograph appears on less than half a page but more than a quarter of a page, 2 is quite a small photograph that is less than a quarter of a page, and 1 is no CEO photo shown in the annual report. Accordingly, the higher the points, the greater the confidence level is identified. For this proxy, only photographs of the CEOs of firms are collected and analysed, not the photos of other managers on the management board.

In terms of the fourth proxy of overconfidence, the bias in earning forecast is investigated. The difference from previous studies that use just a one-year bias, this study uses the average bias in the earnings forecast of firms in two years 2015 and 2016, and then uses a dummy variable for this proxy that is 1 if there is a negative bias, and 0 otherwise. The negative bias comes from the actual earnings being less than the forecasted earnings. Therefore, overconfident managers are identified if they have a negative bias in the difference between the actual earnings and forecasted earnings and also, non-overconfident managers are identified as having a positive bias between the actual earnings and forecasted earnings.

For the last proxy, male and female CEOs are identified through the firms' profiles to represent their overconfidence. Following the paper of Yang and Zhu (2016), Mishra and Metilda (2015), and Huang and Kisgen (2013), males are considered to be more confident than females. Thus, a dummy variable is used with 1 for overconfidence and 0 for non-overconfidence.

For the comprehensive index combined from above five proxies is constructed as follows. For all five proxies, except the fourth and the fifth proxies were dummy value as 1 and 0; all first, second and third proxies are in turn transferred to 1 and 0 form. 1 indicates

overconfident managers and 0 indicates non-overconfident managers. Specifically, firstly, for the voice pitch measure and psychometric test, we find the median value for each type of data. And then, if the sample value is higher than median value, it is denoted with the value of 1, and 0 otherwise. Secondly, for the visibility of CEO's photos in annual reports, we based on the range from 1 to 4 and setup CEOs with 4 points are overconfident with the value of 1 and CEOs with 1, 2, 3 points are non-overconfident managers with the value of 0. After that, the sum of all five proxies is calculated and represents the level of confidence of manager for each research object. Meaning that the higher point, the higher level of overconfidence. Now, we have a new measurement of overconfidence that stemmed from five different proxies and we call it as the sixth proxy of overconfidence.

In this study, overconfidence was measured using six different proxies to avoid a bias in the results when examining the relationship between overconfident managers and cash holding decisions. From these six proxies, six different groups of models were also used to run a regression to test the effect of overconfident managers on cash holdings.

Besides the main control variable of overconfident managers, other traits of managers were also collected, such as age, education, tenure (the number of years working in the company), duality (holding the current position as well as that of chairperson) and managerial ownership. Based on the studies of Malmendier et al. (2011), Graham et al. (2011) and Orens and Reheul (2013), managerial gender, age, education, tenure and duality have a significant relationship with corporate decisions. Hence, this study also develops these variables to examine their relationship with the cash holding level.

In fact, come to this part, we might have a question that whether or not there is a relationship between age, education, tenure, duality or managerial ownership and the level of managerial overconfidence in general, and especially, for voice pitch in particular. Actually, we might think that younger managers tend to be more aggressive than older managers, then affecting on level of voice pitch; similarly, more experienced managers tend to be more cautious than less experienced managers; or more years working in firms make managers having more understanding of firm and less having risk-taking behaviours; managers who are chairperson of firm and also keep another managerial position might be more cautious than managers who are just the manager, but not the owner of firm; and finally, having more percentage of ownership of firm might help to reduce the risk-taking behaviours of managers. Everything taking together, we can say that there might be an

impact of age, education, tenure, duality and managerial ownership on the level of overconfidence. That means overconfident level might be determined by age, education, tenure, duality or managerial ownership. To answer for this question, we attempt to run simple OLS regression models with the dependent variable is each different proxies of managerial overconfidence and the explanatory variables are age, education, tenure, duality or managerial ownership. That means we run five different models with five different proxies, and we find the there are no relationship between managerial overconfidence and age, education, tenure, duality or managerial ownership with support from results of t-test, F-test, and R-squared. Therefore, we can conclude that age, education, tenure, duality or managerial ownership do not affect the level of voice pitch, the result of psychometric test and also other overconfident measurements.

2.3.3. Proxies for cash holdings and other control variables for the determinants of cash holdings

2.3.3.1. Cash holdings

Budin and Handel (1975) and Faulkender (2002) used the cash-sales ratio to estimate cash holdings, while Guney et al. (2003) and Faleye (2004) used cash and marketable securities to total assets as a proxy for cash holdings. Jiang and Lie (2016) represented cash holdings through cash and marketable securities. Pinkowits and Williamson (2001) used the natural logarithm of cash over net assets or assets, which is the same as Subramaniam et al. (2011), Al-Najjar (2013) and Venkiteshwaran (2011). Cash and marketable securities over net assets was used by Locorotondo et al. (2014), Megginson (2014) and Liu et al. (2014). Kling et al. (2014), Achary et al. (2012), Kusnadi et al. (2015), Chen et al. (2012), Klasa et al. (2009), Hall et al. (2013) and Duchin (2010) used cash and cash equivalents relative to total assets and the ratio of cash and short-term investments to total assets (Ghaly et al., 2015).

Based on the previous studies given above, cash holdings in this study is measured by the ratio of cash and equivalent, and short-term investment to the total assets.

For other independent variables, besides the main control variable of overconfident managers and their traits, all the appropriate common and popular control variables that were generally considered by previous studies to affect the cash holding decision are applied. The list of the variables is as follows.

2.3.3.2. Managerial traits

Duality: Duality means that the manager is also the chairperson of the firm. According to Jensen (1993), the manager and the chairperson tend to dominate the firm's operations, hence affecting firm performance. Duality is also mentioned as a factor affecting corporate decisions in the studies by Baliga et al. (1996), and Nahar (2004). Dual-responsibility might make the manager tend to hold excess cash to protect their position (Dahya and Travlos, 2000). In this study, duality is denoted as 1 if the manager is also the chairperson and 0 if the manager does not hold the chairperson position.

LogManager's Age: Age of managers was collected through interviews and annual reports. Age is stated to affect management decisions (Orens and Reheul, 2013). As age is a continuous numeric variable, it is converted to log to run the model.

LogTenure: The tenure refers to the total number of close-knit years in firms regardless of the number of years holding the position. Following Orens and Reheul (2013) and Ting et al. (2015), this study uses the number of close-knit years for which the managers have worked in the company until 2016. Similar to the variable of age, tenure is converted to log of tenure and represented by LogTenure.

Manager's Education: Manager's education is the measurement of the manager's qualification. There are 0 points for managers holding degrees below university level, 1 for bachelor degree, 2 for holding a master's degree, and 3 if the manager holds a doctoral degree. The point arrangement is based on Rakhmayil and Yuce (2011) and Ting et al. (2015) but modified for this research.

Managerial ownership: There is a conflict of interest between managers and shareholders, which is known as the agency problem (Jensen, 1986, Jensen and Meckling, 1976). Accordingly, managers are different from shareholders in that they normally tend to keep a large amount of cash for safety and protection motives, hence leading to a lower profit for firms. Also, managers might use funds for inefficient investments (Ozkan and Orkan, 2004). It is suggested that if the percentage of ownership by managers increases, the interests of managers and shareholders can align. Based on previous studies, this study investigates managerial ownership as the manager's characteristic variable is used to examine its relationship with cash holdings. Managerial ownership is the percentage of managers holding the firm shares, whereby the firm here is the one in which the manager is working.

2.3.3.3. Control variables

Ownership concentration

Ownership concentration is explained as having a negative impact on cash holdings due to the higher ownership concentration causing the difficulty in accumulating cash (Guney, Ozkan, and Ozkan, 2006, Ferreira and Vilela, 2004). Ownership concentration is normally measured by the percentage of common shares owned by the largest three shareholders in firms (La Porte et al., 1996, Guney et al. 2006).

Board size

Board size has been used in a number of previous studies and is stated to play an important role in business operations. It is defined as the number of directors on the board of management (Kusnadi, 2011). According to Yermack (1996), and Lipton and Lorsch (1992), a small board of managers is more effective in corporate management than a larger board of management, especially in the decision-making process. Also, the larger board size is considered to hold more cash than the smaller board size (Yermack, 1996, and Lipton and Lorsch, 1992). However, Kusnadi (2011) found that the relationship between board size and excess cash is negative. This study, therefore, uses board size to examine whether the effect of board size on cash holdings is negative or positive. The board size is then transferred to logarithm to get a better fit for the regression model.

Firm value (Tobin Q and market to book value):

In terms of firm value, Tobin Q and market to book value is popularly used to represent this term. This study thus uses both Tobin Q and market to book value to check the reliability of the regression results.

There have been a number of studies regarding firm value as one of the major factors affecting the cash holding level. Firm value is popularly used to represent the growth opportunities of firms (Lang et al., 1991, Doukas, 1995, Han and Qiu, 2007). Normally, the more growth opportunities firms have, the higher the cash reserves they maintain to capture all opportunities (Han and Qiu, 2007). A number of other studies used Tobin Q to measure firm performance (Wernerfelt and Montgomery, 1988) as well as to measure firm value (Mak and Kusnadi, 2005). Tobin Q is calculated by the following equation:

$$\frac{Market\ value\ of\ equity - Book\ value\ of\ equity + Total\ Assets}{Total\ Assets}$$

For market to book value, in this study it is calculated by Market to book is market value of equity plus book value of debt divided by the book value of assets and represented as the following equation (learning from study of Pinkowitz et al., 2006):

$$\frac{Market\ value\ of\ equity + Book\ value\ of\ debt}{Total\ Assets}$$

Z-score:

According to Garcia-Teruel et al. (2008), financial distress has a significant impact on the holding of liquid assets. The impact is concluded by the reduction of default risk when firms increase the cash holding level (Guney et al., 2003, Ferreira and Vilela, 2004, and Ozkan and Ozkan, 2004). However, Kim et al. (1998) also found that a lower cash holding level is determined by the greater possibility of financial distress. Based on these findings, the study uses Altman's Z score as the proxy for financial distress and examines the relationship between these two aspects.

Z – score is calculated as follows:

Z-score = 1.2A + 1.4B + 3.3C + 0.6D + 1.0E

Where:

A = Working capital/ Total assets

B = Retained earnings/ Total assets

C = EBIT/ Total Assets

D = Market value of equity/ Book value of Total liabilities

E = Sales/ Total Assets

Dividend:

The findings from previous studies offer controversial conclusions about the relationship between dividends and cash holdings. The first point states that the distribution of dividends leads to lower cash levels (Opler et al., 1999). Meanwhile, Ozkan and Ozkan (2004) found that due to the demand for higher cash holdings to pay dividends, firms that pay dividends normally hold more cash. This study, therefore, tries to test the effect of dividends on cash holdings. Dividend paid divided by the profit after tax is used as the variable for dividends in this study.

Leverage

Leverage plays a very important role in corporate management and is seen as an alternative

option for capital in the firm as well as a good substitute for cash (Steijvers and Niskanen, 2013). That means an increase in leverage might lead to a decrease in cash holdings (Kim et al., 1998, Opler et al., 1999, Ozkan and Ozkan, 2004, Ferreira and Vilela, 2004, Najjar, 2012). However, a very high leverage level might make it difficult for a firm to access other borrowing sources such as bank loans. Hence, more cash may be held to minimize risk (Guney et al., 2007). The positive relationship between cash holdings and leverage also indicated in the studies of Acharya et al. (2007) and Gamba and Triantis (2008). This study expects a negative effect from leverage on cash holdings. Leverage is measured by two proxies, namely the ratio of total debt to total assets (Steijvers and Niskanen, 2013, Al-Najjar, 2013, Kalcheva and Lins, 2007, Subramaniam et al., 2010) and the ratio of total debt to total equity (García-Teruel and Martínez-Solano, 2008.

Change in share price

There has been no evidence suggesting that there is a relationship between cash holdings and change in the share price. However, Bourne et al. (2003) stated that share price has a significant impact on firm performance; therefore, this study tries to examine whether there is a relationship between cash holdings and change in the share price.

Firm size

It is argued that smaller firms might find it difficult to access diversified borrowing sources and always use capital that is costly than larger firms (Whited, 1992, Fazzari and Petersen, 1993). Therefore, there can be a significant relationship between firm size and cash holdings. Based on the study of Guney et al. (2007) and García-Teruel and Martínez-Solano (2008), this research uses firm size that is measured by the natural logarithm of gross sales to examine its effect on cash holdings.

Firm quality: Earnings per share change

Earnings per share is used in a vast number of corporate studies as the proxy for firm performance or firm quality (Mangel and Singh, 1993). This study aims to investigate the impact of firm quality on the level of cash holdings, and thus uses change in earnings per share as the proxy for firm quality.

Profitability: Measured by return on assets (ROA)

Fresard (2010) indicated that firms that experience a significant increase in return on assets normally experience large cash holdings. ROA is defined similarly to return on assets from Fresard (2010), meaning that ROA equals earnings before interest and tax divided by total

assets.

Intangible assets

Lin and Su (2008) show that intangible assets have a significant negative impact on cash holdings. Martínez-Sola et al. (2013) also found a significant relationship between intangible assets and cash holdings. Therefore, this study adds the variable of intangible assets to examine its impact on cash holdings in the context of Vietnam. Intangible assets is calculated by the ratio of total intangible assets to total assets, which is the same as Lin and Su (2008) and Martínez-Sola et al. (2013).

Firm age

Liu and Mauer (2011) used firm age as an instrument variable to examine its effect on cash holdings and found a significant relationship between them. Based on the study of Liu and Mauer (2011), this study uses firm age as a control variable to investigate the determinants of cash holdings.

2.4. Model and regression results

2.4.1. Cash holdings and overconfident managers model

Based on the literature review and the construction of the main variables and control variables for the research model, we have the main regression model for cash holdings and managerial overconfidence, which is as follows.

$$Cash_i = \beta_0 + \beta_1 Overconfidence_j + \beta_2 Duality_j + \beta_3 LogManager's\ Age_j +$$
$$\beta_4 LogTenure_j + \beta_5\ LogMaEdu_j + \beta_6 MaOwnership_j + \beta_7 OConcentration_i +$$
$$\beta_8 LogBoardsize_i + \beta_9 Firmvalue_i + \beta_{10} Dividend_i + \beta_{11} ZScore_i + \beta_{12} Leverage_i +$$
$$\beta_{13} Sharepricechange_i + \beta_{14} Firmsize_i + \beta_{15} Firmquality_i + \beta_{16} Profitability_i +$$
$$\beta_{17} Intangible_i + \beta_{18} LogFirmage_i + e_i \qquad (1)$$

Following the literature, it is believed that overconfident managers might normally make aggressive decisions and bring more risks to firms. Therefore, in this research, it is also believed that overconfident managers tend to hold less cash and take more risks but expect to earn more profit from holding less cash. For the duality variable, Dahya and Travlos (2000) suggested that, to protect the manager's position, managers tend to hold more cash if they are holding both the manager position and chairperson position. So, in this research, duality is predicted to bring a positive effect to cash holdings. In terms of manager's age,

we think that the greater the age, the more experience of managers, thus they are more cautious in their process of decision-making, take fewer risks and, therefore, tend to hold more cash. For the variable of tenure, we consider that if the manager has more years working in firms, they better understand the firm, hence might be more subjective and tend to hold less cash. Similarly, it is believed that the higher the education level of manager, the higher the level of confidence and they might expect a lower level of cash holdings. For managerial ownership, we suggest that if a manager has a higher percentage of ownership, they might want to keep more cash to protect themselves, and hence hold more cash.

Regarding the other control variables, in terms of ownership concentration, we agree with previous studies and believe that a high percentage of ownership concentration leads to a lower level of cash holdings due to the difficulty in accumulating cash. For the board size variable, we think that a higher number of managers in board management leads to more diversified viewpoints in corporate decisions, thus they are more cautious in making decisions and tend to hold more cash. For the firm value variable, a higher level of firm value is stated as reserving more money to capture more investment opportunities, hence we also think there is a positive sign for the relationship between firm value and cash holdings. Following the z-score variable, we believe that if a firm has a high probability of financial distress, it means that they are holding less cash. Therefore the sign of the effect of z-score and cash holdings is predicted to be a negative sign. In terms of dividend, we think that if a firm pays more dividend, they must reserve more money, thus we state a positive relationship between dividend and cash holdings. For leverage, as it is an alternative capital source, it is predicted having a negative impact on cash holdings. In terms of the variable of change in share price, we believe that in cases of a decrease in the share price, this might reflect an unstable performance of the firm, hence also affect the cash holdings level. Cash holdings, in this case, might decrease due to an unsteady performance of the firm. Regarding firm size, following the use of gross sales to represent the firm size variable, it is considered that higher sales lead to a higher level of cash holdings. Moving on to firm quality variable, by using change in earnings per share, it is believed that higher earnings per share might reflect good firm performance with more successful investments. Cash now might be used for investments so it might be held at a low level. For the profitability variable, which is measured by return on assets, we state that high returns might lead to high cash holdings. Regarding intangible assets, Lin and Su

(2008) indicate that intangible assets bring a negatively significant impact on cash holdings, and we also agree with this conclusion. Finally, for the firm age variable, with a long history and higher age, it is believed that the cash reserves of such firms are higher than those of younger firms. All of the predictions and explanations for all the necessary variables are represented in table 2.1.

Variables	Symbol	Explanation	Predicted sign	Data source
Dependent variable				
Cash holdings	Cash	Cash and short-term investment/Total Asset		Thomson Reuter Eikon, Annual reports
Main explanatory variables				
Overconfident manager 1	Overconfidence 1	Measured by voice pitch adjustment	-	Interviews
Overconfident manager 2	LogOverconfidence2	Measured by the logarithm of the psychometric test points from interviews	-	Interviews
Overconfident manager 3	Overconfidence 3	Measured by the scale of CEO's photos showed in the firms' 2016 annual reports	-	Annual reports
Overconfident manager 4	Overconfidence 4	Measured by the average bias of the earning forecast in two years 2015 and 2016. 1 if there is a negative bias, otherwise 0	-	Annual reports, manually calculated
Overconfident manager 5	Overconfidence 5	Gender of CEO and gender of other managers, 1 if he is male, otherwise 0	-	Annual reports
Comprehensive index	Overconfidence 6	The comprehensive index combined from overconfidence 1 to overconfidence 5	-	Manual calculation
Other manager's traits variables				
Duality	Duality	The manager is also the chairperson of the company. It is a dummy variable, 1 if the manager holding two management positions, in which one is chairperson, 0 if otherwise	+	Interviews, annual reports
Managers' age	LogMaAge	The logarithm of age of managers	+	Interviews, annual reports
Tenure	LogTenure	The logarithm of total number of close-knit years in firms regardless the number of years holding position.	-	Interviews, annual reports
Managers' education	LogMaEdu	Qualifications of managers, it is the logarithm of the manager's points of education. The point for it is 0 for managers holding degrees below university, 1 for bachelor degree, 2 for holding a master degree, 3 if the manager holds a doctoral degree.	-	Interviews, annual reports
Manager's ownership	MaOwnership	The percentage of holding the firm's share, which the firm here is the firm the manager is working	+	annual reports
Other control variables				
Ownership concentration	OConcentration	The total percentage of top 3 owners of the firms	-	Thomson Reuter Eikon and annual

				reports
Board size	LogBoardsize	The logarithm of number of members in the board of directors including director, vice director, chief of financial officer, chief of the accounting officer.	+	Thomson Reuter Eikon and annual reports
Firm value	Firmvalue1 and Firmvalue2	Represent firm value by the two proxies of market to book value and Tobin Q	+	Calculated by hand after collecting required data from Thomson Reuter Eikon and annual reports.
Dividend	Dividend	Dividend paid divided by the profit after tax	+	Thomson Reuter Eikon, annual reports
Altman's Z	ZScore	Altman's Z score is the proxy for financial distress	-	Calculated by hand after collecting data from Thomson Reuter Eikon and annual reports.
Financial leverage	Leverage1 and Leverage2	There are two proxies of financial leverage. Leverage1 is measured by total debt divided by total assets, leverage2 is measured by total debt divided by total equity	-	Thomson Reuter Eikon and annual reports
Change in share price	Sharepricechange	The yearly change in share price	-	Thomson Reuter Eikon
Firm size	Firmsize	The logarithm of sales growth. It is adjusted after removing the effect of inflation	+	Thomson Reuter Eikon, annual reports
Earnings per share change	Firmquality	It is measured by the change in yearly earnings per share	-	Thomson Reuter Eikon, annual reports
Profitability	Profitability	The proxy is return on assets (ROA). It is measured by Earning before interest and tax divided by total assets	+	Thomson Reuter Eikon, annual reports
Intangible assets	Intangible	Measured by total intangible assets divided by total assets	-	Thomson Reuter Eikon, annual reports
Firm's age	LogFirmage	The logarithm of the number of years after founding to 2016	+	Thomson Reuter Eikon, annual reports

Table 2.1: Expected signs of variables for the determinants of cash holdings

2.4.2. Descriptive statistics

The descriptive statistics of all variables used to test the influence of overconfident managers are given in table 2.2. The proxy used to represent the dependent variable of cash holdings is cash, cash is calculated by total cash and equivalent, and short-term investment divided by total assets. In terms of managerial overconfidence, six proxies are taken and measured through voice pitch analysis, psychometric testing, CEO photos, bias in earnings forecast, gender of CEOs and the comprehensive index, and are represented as

Overconfidence1, Overconfidence2, Overconfidence3, Overconfidence4, Overconfidence5, Overconfidence6, respectively.

To prevent outlier data that might cause a bias in the estimation, we use winsorize command to trim the data at 1% and 99%.

Variable	Observation	Mean	Std. Dev.	Min	Max
DEPENDENT VARIABLE					
Cash	123	0.135	0.161	0.000	0.788
MAIN EXPLANATORY VARIABLES					
Overconfidence1	118	0.685	0.163	0.400	0.981
Overconfidence2	111	15.828	2.914	4.000	21.000
LogOverconfidence2	111	1.188	0.112	0.602	1.322
Overconfidence3	123	1.463	0.926	1.000	4.000
Overconfidence4	107	0.505	0.502	0.000	1.000
Overconfidence5	123	0.789	0.410	0.000	1.000
Overconfidence6	123	2.293	1.123	0.000	5.000
OTHER MANAGER'S TRAITS VARIABLES					
Duality	123	0.081	0.274	0.000	1.000
MaAge	120	41.675	6.165	30.000	57.000
LogMaAge	120	1.615	0.063	1.477	1.756
Tenure	117	7.368	6.188	0.500	32.000
LogTenure	117	0.706	0.412	-0.301	1.505
MaEdu	118	1.407	0.558	0.000	3.000
LogMaEdu	116	0.128	0.154	0.000	0.477
MaOwnership	122	0.029	0.060	0.000	0.300
OTHER CONTROL VARIABLES					
OConcentration	122	0.523	0.212	0.059	0.984
Boardsize	123	4.683	1.762	2.000	9.000
LogBoardsize	123	0.639	0.170	0.301	0.954
Firmvalue1	118	0.805	0.783	0.055	5.255
Firmvalue2	118	1.101	0.772	0.281	5.603
Dividend	120	0.452	0.650	0.000	4.249
ZScore	110	4.027	10.297	-0.590	76.032
Leverage1	120	0.235	0.203	0.000	0.736
Leverage2	118	0.902	1.152	0.000	5.538
Sharepricechange	100	0.245	0.585	-0.721	2.125
Firmsize	120	8.600	0.816	6.558	10.670
Firmquality	109	-0.139	3.023	-17.457	5.934
Profitability	120	0.082	0.095	-0.188	0.403
Intangible	120	0.027	0.080	0.000	0.547
Firmage	123	23.293	14.163	4.000	58.000
LogFirmage	123	1.285	0.275	0.602	1.763

Table 2.2: Descriptive statistics for the sub-sample size cash holding model

The statistics generally indicate that the minimum level of cash holdings for Vietnamese firms is no cash over the total assets and the maximum level of that is 78.8%, and the average cash holdings for firms is 13.5%. For the overconfidence variables, except Overconfidence3 and Overconfidence5, which are fully collected from all 123 firms of sample size, for others the data is not fully collected for various reasons, such as refusing to record the interviews, not answering the psychometric test questions or unavailability of the earnings forecast in the annual report. In terms of voice pitch measurement, after adjusting, the range is from 0.4 to 0.981 with a mean of 0.685. Regarding the psychometric test, after transforming to the logarithm form, the range is from 0.602 to 1.322. For the photo sizes, it ranges from 1 to 4. For Overconfidence4, it seems there is an equal percentage of bias and unbiased earnings forecast with a mean of 0.502. Regarding Overconfidence5, the percentage of male managers accounts for 78.9%, while

female managers only account for 22.1%. And for the final overconfidence proxy, it ranges from 0 to 5 following the sum of all points constructed from the six different overconfidence proxies and the mean of the sixth proxy is 2.293.

Duality shows that only 8.1% of respondents are holding the position of chairperson along with the other position on the board of management. The age of managers in this study is from 30 to 57, the tenure is between 0.5 years and 32 years and, after adjusting to the logarithm, it is from -0.301 to 1.505. The mean for the manager's qualification is 1.407, ranging from 1 to 3. The percentage of share ownership of managers is not high, with an average of 2.9%, whereby there are a number of managers who do not hold shares in their firm, and the maximum percentage of managerial ownership is 30%. The ownership concentration is between 5.9% and 98.4%. The number of managers in the management team is from 2 to 9; this is subsequently changed to logarithm for a better fit of the regression measurement.

For the other control variables, Firm value 1, Firm value 2, Dividend, Z-score, Leverage 1, Leverage 2, Change in share price, Firm size, Firm quality, Profitability, Intangible assets, and logarithm of Firm age have mean values of 1.101, 0.805, 0.452, 4.027, 0.235, 0.902, 0.245, 8.600, -0.139, 0.082, 0.027, and 1.285, respectively.

2.4.3. Correlation Matrix

Following the correlation matrix in Table 2.3, it is reported that there is a negative relationship between overconfident managers and cash holdings for all proxies of confident managers. These relationships seem to be the same as the expected signs of this study, which are shown in table 2.1. Regarding the other managerial attributes, LogTenure and LogMaEdu are shown to have a positive relationship with cash, while duality, manager's age, and manager ownership have negative effects on cash. Thus, for all managerial attributes, the relationships shown in the correlation matrix are very different from the expectation. Regarding the control variables, ownership concentration, firm value, Z-score, dividend, change in share price, firm quality, profitability and intangible assets positively relate to cash, while board size, leverage, firm size and firm age are contrary. Thus, among them, ownership concentration, Z-score, change in share price, firm quality, intangible assets, board size, firm size and firm age have different effects compared to predicted signs.

Actually, the signs from the correlation matrix are just a reference for the relationships among the variables. In order to confirm exactly the relationship between cash holdings

and independent variables, we need to run the necessary regressions, which are conducted and explained in the following sections.

Table 2.3: Correlation matrix for the sub-sample size cash holding model

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Cash (1)	1.000																									
Overconfidence1 (2)	-0.100	1.000																								
LogOverconfidence2 (3)	-0.078	0.035	1.000																							
Overconfidence3 (4)	-0.172	0.058	0.135	1.000																						
Overconfidence4 (5)	-0.322	0.025	0.143	0.225	1.000																					
Overconfidence5 (6)	-0.135	0.619	0.117	-0.020	0.093	1.000																				
Overconfidence6 (7)	-0.319	0.594	0.350	0.328	0.604	0.610	1.000																			
Duality (8)	-0.085	0.137	0.094	-0.075	0.241	-0.030	0.163	1.000																		
LogMaAge (9)	-0.080	-0.086	-0.144	-0.016	-0.126	-0.211	-0.195	-0.025	1.000																	
LogTenure (10)	0.121	0.088	-0.085	0.009	-0.270	-0.053	-0.053	0.145	0.425	1.000																
LogMaEdu (11)	0.104	0.236	0.042	0.089	-0.136	0.284	0.092	0.037	-0.121	-0.023	1.000															
MaOwnership (12)	-0.050	-0.003	0.031	-0.073	0.189	-0.135	0.005	0.301	0.332	-0.024	-0.163	1.000														
OConcentration (13)	0.092	-0.075	0.005	-0.030	-0.069	0.094	-0.043	-0.126	-0.277	0.080	0.164	-0.085	1.000													
LogBoardsize (14)	-0.170	-0.148	0.034	0.169	-0.125	0.106	-0.089	-0.194	-0.093	-0.051	0.082	-0.214	0.148	1.000												
Firmvalue1 (15)	0.259	0.093	0.066	-0.049	-0.239	0.071	-0.028	-0.055	0.020	0.142	0.075	-0.096	0.047	0.017	1.000											
Firmvalue2 (16)	0.224	0.088	0.098	-0.046	-0.236	0.099	-0.006	-0.070	-0.016	0.137	0.074	-0.130	0.092	0.067	0.983	1.000										
Dividend (17)	0.253	-0.252	0.105	-0.118	-0.076	-0.258	-0.144	0.045	0.053	0.048	-0.006	0.012	0.025	-0.046	0.038	0.062	1.000									
ZScore (18)	0.383	0.159	0.090	-0.068	-0.119	0.082	0.065	-0.097	0.127	0.114	0.123	0.143	-0.023	-0.204	0.669	0.707	0.136	1.000								
Leverage1 (19)	-0.352	-0.147	-0.118	-0.033	-0.004	-0.057	-0.078	0.142	-0.101	-0.025	-0.068	-0.152	-0.086	0.233	-0.180	-0.140	-0.104	-0.494	1.000							
Leverage2 (20)	-0.362	-0.121	-0.065	-0.094	0.098	0.004	-0.013	0.076	-0.135	0.028	0.008	-0.152	0.006	0.242	-0.154	-0.169	-0.124	-0.450	0.845	1.000						
Sharepricechange (21)	0.139	-0.031	-0.220	0.049	-0.249	-0.060	-0.095	-0.129	0.010	0.044	0.121	-0.077	-0.019	0.037	0.387	0.401	0.035	0.413	-0.170	-0.189	1.000					
Firmsize (22)	-0.013	-0.209	0.054	0.323	-0.146	-0.122	-0.141	-0.126	-0.007	0.017	0.086	-0.233	-0.014	0.568	0.252	0.232	0.144	-0.007	0.298	0.230	0.072	1.000				
Firmquality (23)	0.031	-0.171	-0.075	0.082	-0.035	-0.100	-0.135	-0.403	0.085	-0.134	-0.049	-0.035	0.120	0.011	-0.013	-0.023	-0.039	0.148	-0.240	-0.260	0.097	0.126	1.000			
Profitability (24)	0.430	0.013	0.103	-0.079	-0.294	-0.022	-0.120	-0.149	0.106	0.189	0.085	-0.027	0.044	0.013	0.748	0.771	0.246	0.741	-0.287	-0.294	0.421	0.196	0.148	1.000		
Intangible(25)	0.072	-0.095	-0.499	0.058	0.064	-0.083	-0.090	0.053	0.212	0.023	-0.216	0.196	-0.013	-0.043	-0.058	-0.038	0.036	-0.023	-0.046	-0.078	-0.116	0.048	-0.021	-0.027	1.000	
LogFirmage (26)	-0.049	0.177	0.018	-0.193	0.096	0.153	0.227	-0.082	0.048	0.105	0.157	-0.088	0.116	-0.078	0.087	0.040	-0.033	0.016	0.039	0.205	-0.125	0.047	-0.024	0.066	-0.043	1.000

2.4.4. Findings and empirical results

2.4.4.1. Overconfident managers and cash holdings

The empirical tests employed to verify the model are summarized in table 2.4 below. In general, an overconfident manager is negatively correlated to cash holdings with all six models of Overconfidence1 to Overconfidence6. This means the higher the overconfidence level of managers, the lower the cash holding level the company tends to have.

By using cross-sectional data from 123 listed firms in Vietnam, we use both OLS with a robust check and a GLS model to run the regression to avoid any error occurring when only using the OLS model. The results for all models with six proxies of overconfidence demonstrate that the models are suitable, whereby the values of *Prob > F* are *Prob > chi2* very small, namely around 0.0000 for all models. It has also been shown that there is no problem of multicollinearity (with VIF results shown with around 2), autocorrelation and heteroscedasticity in all models. The total number of observations is reduced after running the regression, ranging from 82 to 91 observations.

Following the regression of the models, a number of variables are believed to have a significant relationship with cash, namely overconfident manager, manager's age, board size, leverage, and profitability. For all the main variables of overconfidence measured, the findings indicate that if the level of a manager's overconfidence increases by 1 unit, cash might decrease by about 0.032 to 0.313 units, depending on the different proxies of variables. The variables Overconfidence1, Overconfidence3, Overconfidence5 and Overconfidence6 are significant at 5%, while Overconfidence2 and Overconfidence4 are significant at 1%.

For manager's age, there is a negative relationship between the manager's age and cash holdings, which means that the older the managers are, the lower level of cash holdings are held. The same relationships are found in board size and leverage. In terms of profitability, the higher the profitability of the firms, the higher the cash holding levels. In terms of change in share price, there is only one sign of a model showing a significantly negative relationship with cash holdings. Regarding tenure of managers, only one model with Overconfidence6 showing the positive impact of managerial tenure on cash holdings. For the remaining variables, namely Duality, LogMaEdu, MaOwnership, OConcentration, Firmvalue, Dividend, ZScore, Firmsize, Firmquality, Intangible, LogFirmage there is no evidence showing a significant relationship among them with cash holdings.

INDEPENDENT VARIABLES	DEPENDENT VARIABLE											
	CASH											
	OLS (1)	GLS (2)	OLS (3)	GLS (4)	OLS (5)	GLS (6)	OLS (7)	GLS (8)	OLS (9)	GLS (10)	OLS (11)	GLS (12)
MAIN EXPLANATORY VARIABLES												
Overconfidence1	-0.187*	-0.187**										
	(0.111)	(0.085)										
LogOverconfidence2			-0.320***	-0.320***								
			(0.112)	(0.130)								
Overconfidence3					-0.032**	-0.032*						
					(0.013)	(0.015)						
Overconfidence4							-0.089***	-0.089***				
							(0.033)	(0.030)				
Overconfidence5									-0.079**	-0.079**		
									(0.037)	(0.035)		
Overconfidence6											-0.049***	-0.049***
											(0.015)	(0.011)
OTHER MANAGERIAL TRAITS EXPLANATORY VARIABLES)												
Duality	-0.036	-0.036	-0.026	-0.026	-0.052	-0.052	0.015	0.015	-0.027	-0.027	-0.029	-0.029
	(0.057)	(0.058)	(0.061)	(0.060)	(90.057)	(0.058)	(0.058)	(0.075)	(0.052)	(0.059)	(0.062)	(0.054)
LogMaAge	-0.698**	-0.698	-0.666	-0.666**	-0.619*	-0.619**	-0.711*	-0.711***	-0.721**	-0.721***	-0.898***	-0.898***
	(0.366)	(0.273)	(0.400)	(0.311)	(0.341)	(0.269)	(0.398)	(0.293)	(0.350)	(0.275)	(0.350)	(0.257)
LogTenure	0.065	0.065	0.046	0.046	0.060	0.060	0.034	0.034	0.058	0.058	0.064	0.064**
	(0.047)	(0.036)	(0.044)	(0.038)	(0.044)	(0.036)	(0.042)	(0.039)	(0.043)	(0.036)	(0.04)	(0.033)
LogMaEdu	0.106	0.106	0.075	0.075	0.091	0.091	-0.001	-0.001	0.104	0.104	0.085	0.085
	(0.111)	(0.085)	(0.102)	(0.089)	(0.105)	(0.084)	(0.107)	(0.092)	(0.104)	(0.085)	(0.094)	(0.077)
MaOwnership	-0.025	-0.025	0.013	0.013	0.040	0.040	-0.114	-0.114	-0.060	-0.060	0.021	0.021
	(0.443)	(0.359)	(0.503)	(0.394)	(0.438)	(0.359)	(0.510)	(0.389)	(0.387)	(0.359)	(0.396)	(0.33)
OTHER CONTROL VARIABLES												
OConcentration	-0.045	-0.045	-0.005	-0.005	-0.014	-0.014	-0.044	-0.044	-0.035	-0.035	-0.076	-0.076
	(0.078)	(0.065)	(0.075)	(0.067)	(0.070)	(0.063)	(0.079)	(0.069)	(0.074)	(0.064)	(0.071)	(0.060)
LogBoardsize	-0.160	-0.160*	-0.169	-0.169*	-0.199*	-0.199**	-0.114	-0.114	-0.096	-0.096	-0.126	-0.126
	(0.105)	(0.090)	(0.108)	(0.098)	(0.110)	(0.091)	(0.108)	(0.098)	(0.105)	(0.096)	(0.092)	(0.084)
Firmvalue1	-0.001	-0.001	-0.013	-0.013	-0.005	-0.005	-0.013	-0.013	0.001	0.001	0.004	0.04
	(0.029)	(0.023)	(0.037)	(0.026)	(0.029)	(0.023)	(0.038)	(0.026)	(0.029)	(0.023)	(0.027)	(0.021)
Dividend	0.014	0.014	0.024	0.024	0.017	0.017	0.018	0.018	0.015	0.015	0.015	0.015
	(0.021)	(0.019)	(0.019)	(0.019)	(0.020)	(0.018)	(0.019)	(0.018)	(0.017)	(0.019)	(0.015)	(0.017)
ZScore	-0.003	-0.003	0.002	0.002	-0.002	-0.002	0.006	0.006	-0.002	-0.002	-0.004	-0.004
	(0.002)	(0.003)	(0.009)	(0.008)	(0.002)	(0.003)	(0.011)	(0.011)	(0.002)	(0.003)	(0.002)	(0.002)
Leverage1	-0.177**	-0.177**	-0.146	0.146*	-0.166**	-0.166**	-0.112	-0.112	-0.160*	-0.160**	-0.207**	-0.207***
	(0.086)	(0.077)	(0.102)	(0.086)	(0.087)	(0.076)	(0.095)	(0.083)	(0.089)	(0.076)	(0.076)	(0.071)
Sharepricechange	-0.038	-0.038	-0.045	-0.045*	-0.027	-0.027	-0.045	-0.045*	-0.043	-0.043*	-0.051*	-0.051**
	(0.030)	(0.025)	(0.032)	(0.027)	(0.025)	(0.024)	(0.028)	(0.025)	(0.028)	(0.025)	(0.027)	(0.023)
Firmsize	-0.003	-0.003	0.014	0.014	0.024	0.024	-0.003	-0.003	-0.008	-0.008	-0.004	-0.004
	(0.024)	(0.020)	(0.021)	(0.021)	(0.023)	(0.022)	(0.024)	(0.020)	(0.023)	(0.020)	(0.022)	(0.018)
Firmquality	-0.003	-0.003	-0.003	-0.003	-0.002	-0.002	0.000	0.000	-0.001	-0.001	-0.002	-0.002
	(0.004)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)	(0.006)	(0.006)	(0.004)	(0.005)	(0.004)	(0.004)
Profitability	0.645**	0.645***	0.642**	0.642***	0.546*	0.546***	0.440	0.440**	0.629**	0.629***	0.595**	0.595***
	(0.309)	(0.207)	(0.337)	(0.232)	(0.313)	(0.209)	(0.326)	(0.239)	(0.313)	(0.206)	(0.267)	(0.191)
Intangible	0.026	0.026	-0.054	-0.054	-0.003	-0.003	0.578**	0.578	0.062	0.062	0.083	0.083
	(0.185)	(0.199)	(0.124)	(0.215)	(0.198)	(0.198)	(0.302)	(0.398)	(0.191)	(0.200)	(0.178)	(0.184)
LogFirmage	-0.026	-0.026	-0.036	-0.036	-0.063	-0.063	0.016	0.016	-0.019	-0.019	0.011	0.011
	(0.060)	(0.049)	(0.062)	(0.050)	(0.066)	(0.050)	(0.067)	(0.057)	(0.061)	(0.050)	(0.052)	(0.047)
Intercept	1.532**	1.532***	1.589**	1.589***	1.160*	1.160***	1.393**	1.393***	1.484**	1.484***	1.795***	1.795***
	(0.763)	(0.492)	(0.795)	(0.556)	(0.640)	(0.466)	(0.762)	(0.506)	(0.694)	(0.484)	(0.690)	(0.450)
Number of obs	91	91	84	84	91	91	82	82	91	91	91	91
Prob > F	*0.0024*		*0.0006*		*0.0015*		*0.0000*		*0.0001*		*0.0000*	
Wald Chi2		*61.60*		*58.33*		*61.41*		*63.60*		*61.79*		*87.95*
Prob > Chi2		*0.0000*		*0.0000*		*0.0000*		*0.0000*		*0.0000*		*0.0000*
VIF	*2.02*		*2.01*		*2.02*		*2.05*		*2.07*		*2.03*	

Notes: The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1 % level, respectively. The standard errors are robust to heteroscedasticity.

Note that all alternative independent variables such as Firmvalue2 and Leverage2 are in turn interchangeable to models. The results revealed the same relationship with cash holdings.

Table 2.4: Regression results of managerial overconfidence and cash holdings

2.4.4.2. Do overconfident managers lead to a higher deviation in the target cash holding level?

After checking the relationship of the main variable of manager's overconfidence, we find the optimal cash holding level by determining the fitted value for cash holdings and then determining the deviation of the cash level between the actual cash level and the optimal cash level. Also, we examine the second hypothesis concerning the relationship between deviation and overconfident managers. The main dependent variable in this model is DEVIATION$_i$, defined as the absolute value of the dependent variable of Cash minus the fitted value of Cash. The fitted value is found after running the regression. Each firm has a different fitted value that reflects the best-fit model for the best cash holding level of the firm. According to Opler et. al (1999), there are two methods to determine the target cash level, in which one is the use of fitted value of a cross-sectional regression of cash holdings. So, we believe that the fitted value is the best value that reflects the optimal level of cash holdings.

We believe that the greater the level of overconfidence, the higher probability of holding cash that might be highly different from the optimal level the firm needs to hold. We construct the model as follows.

$$
\begin{aligned}
Deviation_i = {} & \alpha_0 + \alpha_1 Overconfidence_j + \alpha_2 Duality_j + \alpha_3 LogManager's\ Age_j + \\
& \alpha_4 LogTenure_j + \alpha_5 LogMaEdu_j + \alpha_7 MaOwnership_j + \alpha_8 OConcentration_i + \\
& \alpha_9 LogBoardsize_i + \alpha_{10} Firmvalue_i + \alpha_{11} Dividend_i + \alpha_{12} ZScore_i + \alpha_{13} Leverage_i \\
& + \alpha_{14} Sharepricechange_i + \alpha_{15} Firmsize_i + \alpha_{16} Firmquality_i + \alpha_{17} Profitability_i + \\
& \alpha_{18} Intangible_i + \alpha_{19} LogFirmage_i + \epsilon_i \qquad\qquad (2)
\end{aligned}
$$

All models, in this case, are also demonstrated as being suitable, with the value of *Prob > chi2* equalling about 0.000 and *Wald chi2* equalling the range between 45.27 and 83.11. After regressing, the numbers of observations are reduced and range from 82 to 91, depending on each model.

INDEPENDENT VARIABLES	DEPENDENT VARIABLE					
	DEVIATION					
	GLS (13)	GLS (14)	GLS (15)	GLS (16)	GLS (17)	GLS (18)
MAIN EXPLANATORY VARIABLES						
Overconfidence1	-0.128***					
	(0.038)					
LogOverconfidence2		0.015				
		(0.067)				
Overconfidence3			-0.015**			
			(0.008)			
Overconfidence4				-0.041***		
				(0.015)		
Overconfidence5					-0.031**	
					(0.016)	
Overconfidence6						-0.021***
						(0.005)
OTHER MANAGERIAL TRAITS EXPLANATORY VARIABLES						
Duality	-0.070***	-0.045	-0.063**	-0.012	-0.061***	-0.042
	(0.026)	(0.031)	(0.030)	(0.037	(0.027)	(0.026)
LogMaAge	-0.519***	-0.479***	-0.498***	-0.310**	-0.590***	-0.423***
	(0.123)	(0.160)	(0.140)	(0.146)	(0.125)	(0.123)
LogTenure	0.051***	0.033*	0.041**	-0.001	0.056***	0.041***
	(0.016)	(0.020)	(0.019)	(0.019)	(0.016)	(0.016)
LogMaEdu	0.088**	0.058	0.046	-0.064	0.076**	0.021
	(0.038)	(0.046)	(0.044)	(0.046)	(0.039)	(0.037)
MaOwnership	0.257	0.166	0.294	-0.048	0.167	0.079
	(0.162)	(0.203)	(0.186)	(0.195)	(0.164)	(0.159)
OTHER CONTROL VARIABLES						
OConcentration	-0.062**	-0.040	-0.044	0.002	-0.063**	-0.036
	(0.029)	(0.034)	(0.033)	(0.034)	(0.029)	(0.029)
LogBoardsize	-0.152***	-0.144***	-0.130***	-0.113**	-0.160***	-0.146***
	(0.041)	(0.051)	(0.047)	(0.049)	(0.044)	(0.040)
Firmvalue1	0.003	-0.020	-0.010	-0.015	-0.003	-0.006
	(0.010)	(0.013)	(0.012)	(0.013)	(0.010)	(0.010)
Dividend	-0.009	-0.007	-0.004	-0.007	-0.016**	-0.018**
	(0.008)	(0.010)	(0.010)	(0.009)	(0.008)	(0.008)
ZScore	-0.002	0.004	-0.001	0.007	-0.002	-0.001
	(0.001)	(0.004)	(0.001)	(0.004)	(0.001)	(0.001)
Leverage1	-0.061*	0.006	-0.024	0.044	-0.045	-0.041
	(0.035)	(0.044)	(0.040)	(0.041)	(0.034)	(0.034)
Sharepricechange	-0.022**	-0.018	-0.017	-0.025**	-0.026***	-0.032***
	(0.011)	(0.014)	(0.013)	(0.013)	(0.011)	(0.011)
Firmsize	-0.006	0.000	0.003	-0.012	-0.004	0.002
	(0.009)	(0.011)	(0.011)	(0.010)	(0.009)	(0.009)
Firmquality	0.002	0.003	0.004	0.005*	0.004	0.001
	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.002)
Profitability	0.172**	0.174	0.140	-0.004	0.193**	0.242***
	(0.093)	(0.120)	(0.109)	(0.119)	(0.094)	(0.091)
Intangible	-0.002	-0.212**	-0.062	-0.224	0.017	-0.009
	(0.090)	(0.111)	(0.103)	(0.199)	(0.091)	(0.088)
LogFirmage	-0.019	-0.034	-0.035	-0.031	-0.022	-0.011
	(0.022)	(0.026)	(0.026)	(0.029)	(0.023)	(0.022)
Intercept	1.201***	0.973***	1.028***	0.825***	1.241***	0.913***
	(0.222)	(0.287)	(0.242)	(0.253)	(0.221)	(0.216)
Number of obs	91	84	91	82	91	91
Wald chi2	78.83	45.44	45.27	59.40	83.11	67.07
Prob > chi2	0.0000	0.0010	0.0010	0.0000	0.0000	0.0000

Notes: The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1 % level, respectively. The standard errors are robust to heteroscedasticity.

Note that all alternative independent variables such as Firmvalue2 and Leverage2 are in turn interchangeable to models. The results revealed the same relationship with Deviation.

Table 2.5: Regression results for deviation from the optimal cash holding level

Surprisingly, the empirical results from almost all models (models with different proxies of overconfidence and other control variables) except the model of LogOverconfidence2 indicate that there is a negative relationship between overconfident managers and deviation, which is very different from the prediction. This means that if the level of overconfidence increases by 1 unit, the deviation might decrease by around 0.015 to 0.128 units, depending on different proxies of overconfidence. Also, the significance levels of all significant proxies of overconfidence are very high with 1% and 5%.

Furthermore, in almost all models, duality, manager's age, tenure, manager's education, board size, and change in share price are indicated as having a significant impact on deviation. Duality, manager's age, board size, and change in share price have negative effects on deviation and the other variables have positive impacts on deviation.

In terms of manager's ownership, ownership concentration, firm value, dividend, z-score, leverage, firm quality, profitability, and intangible, there is a little evidence confirming the significant relationship among them and deviation. Meanwhile, there is no evidence of an association between firm size and firm age and deviation.

2.4.4.3. Cash holdings and overconfidence in the extended sample size

To avoid a bias in the regression from the previous part of examining the impact of managerial overconfidence on cash holdings due to the small sample size, we extend the sample size to the whole population of 648 non-financial firms with the available data for managerial overconfidence. In fact, as some of the data from the whole population are missing, the number of the final large sample size reduces from 648 to the range of 431 to 505. The different sample size is due to the fact that there are several models with different proxies of control variables, namely firm value and leverage. The different number of sample sizes stems from some missing data for each model.

The overconfidence variable available for the larger sample size is the bias in earnings forecast, which is easily collected from the firm's annual report. Therefore, the bias in earnings forecast is used as the measurement for the proxy of overconfidence in the extended sample size.

In this section, the OLS and GLS are in turn used to test the impact of managerial overconfidence on cash holdings. After that, the GLS regression is also used to test the relationship between managerial overconfidence and deviation.

Interestingly, it also indicated that there is a negative relationship between cash holdings and managerial overconfidence and between deviation and managerial overconfidence (see table 2.6). The significant level of this proxy is also very high at only 1%. The results once more strongly confirm that the higher level of overconfidence, the lower amounts of cash are held. However, it does not mean that the more overconfidence, the higher the deviation of the actual level of cash holdings compared to the optimal level.

Table 2.6: Regression results for the extended sample size of cash holdings

INDEPENDENT VARIABLES	DEPENDENT VARIABLE											
	CASH (OLS and GLS); and DEVIATION											
	OLS (19)	GLS (20)	Deviation (21)	OLS (22)	GLS (23)	Deviation (24)	OLS (25)	GLS (26)	Deviation (27)	OLS (28)	GLS (29)	Deviation (30)
MAIN EXPLANATORY VARIABLE												
Overconfidence4	-0.037***	-0.037***	-0.031***	-0.040***	-0.040***	-0.035***	-0.041***	-0.041***	-0.036***	-0.038***	-0.038***	-0.033***
	(0.015)	(0.015)	(0.009)	(0.015)	(0.015)	(0.009)	(0.015)	(0.015)	(0.009)	(0.015)	(0.015)	(0.009)
OTHER MANAGERIAL TRAITS EXPLANATORY VARIABLES												
Duality	0.014	0.014	0.011	0.013	0.013	0.009	0.011	0.011	0.008	0.012	0.012	0.011
	(0.017)	(0.016)	(0.010)	(0.018)	(0.017)	(0.010)	(0.018)	(0.017)	(0.010)	(0.018)	(0.016)	(0.010)
LogMaAge	0.191*	0.191*	0.039	0.179	0.179*	0.065	0.203*	0.203**	0.110*	0.202*	0.202**	0.083
	(0.106)	(0.104)	(0.063)	(0.109)	(0.107)	(0.063)	(0.111)	(0.107)	(0.063)	(0.109)	(0.105)	(0.063)
LogTenure	-0.042*	-0.042**	-0.039***	-0.038	-0.038*	-0.042***	-0.039	-0.039*	-0.047***	-0.044*	-0.044**	-0.044***
	(0.024)	(0.021)	(0.013)	(0.024)	(0.022)	(0.013)	(0.025)	(0.022)	(0.013)	(0.024)	(0.022)	(0.013)
LogMaEdu	0.081	0.081*	0.052*	0.097*	0.097**	0.054**	0.101**	0.101**	0.054**	0.090*	0.090**	0.052*
	(0.050)	(0.046)	(0.028)	(0.054)	(0.048)	(0.028)	(0.051)	(0.048)	(0.028)	(0.051)	(0.047)	(0.028)
MaOwnership	-0.044	-0.044	0.015	-0.057	-0.057	0.014	-0.073	-0.073	-0.009	-0.060	-0.060	-0.005
	(0.094)	(0.078)	(0.047)	(0.095)	(0.080)	(0.047)	(0.098)	(0.081)	(0.048)	(0.097)	(0.080)	(0.048)
OTHER CONTROL VARIABLES												
OConcentration	0.077**	0.077***	0.039**	0.079**	0.079***	0.041**	0.079**	0.079***	0.040**	0.077**	0.077***	0.037**
	(0.037)	(0.032)	(0.019)	(0.038)	(0.033)	(0.019)	(0.038)	(0.032)	(0.019)	(0.037)	(0.032)	(0.019)
LogBoardsize	0.006	0.006	-0.034	0.016	0.016	-0.033	0.004	0.004	-0.048	-0.010	-0.010	-0.049
	(0.048)	(0.050)	(0.030)	(0.051)	(0.051)	(0.030)	(0.051)	(0.051)	(0.030)	(0.049)	(0.050)	(0.030)
Firmvalue1	0.028	0.028	0.008	0.028	0.028	0.010						
	(0.020)	(0.018)	(0.011)	(0.021)	(0.019)	(0.011)						
Firmvalue2							-0.007	-0.007	-0.006	0.005	0.005	-0.005
							(0.022)	(0.020)	(0.012)	(0.022)	(0.020)	(0.012)
Dividend	0.004	0.004	0.000	0.004	0.004	0.000	0.004	0.004	-0.001	0.004	0.004	-0.002
	(0.004)	(0.005)	(0.003)	(0.004)	(0.005)	(0.003)	(0.004)	(0.005)	(0.003)	(0.004)	(0.005)	(0.003)
ZScore	0.009***	0.009***	0.004***	0.012***	0.012***	0.005***	0.015***	0.015***	0.008***	0.011**	0.011***	0.007***
	(0.004)	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.005)	(0.003)	(0.002)	(0.005)	(0.003)	(0.002)
Leverage1	-0.146***	-0.146***	-0.031							-0.155***	-0.155***	-0.029
	(0.046)	(0.044)	(0.027)							(0.051)	(0.046)	(0.027)
Leverage2				-0.013	-0.013	0.000	-0.012	-0.012	0.001			
				(0.008)	(0.008)	(0.005)	(0.009)	(0.008)	(0.005)			
Sharepricechange	-0.011	-0.011	-0.005	-0.011	-0.011	-0.005	-0.001	-0.001	-0.003	-0.002	-0.002	-0.003
	(0.012)	(0.013)	(0.008)	(0.013)	(0.013)	(0.008)	(0.013)	(0.013)	(0.008)	(0.012)	(0.013)	(0.008)
Firmsize	-0.013	-0.013	-0.015**	-0.024	-0.024**	-0.017**	-0.017	-0.017	-0.017**	-0.007	-0.007	-0.016**
	(0.016)	(0.013)	(0.008)	(0.016)	(0.013)	(0.008)	(0.016)	(0.013)	(0.008)	(0.017)	(0.013)	(0.008)
Firmquality	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.001*	0.000	0.000	0.001*
	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Profitability	0.259*	0.259**	0.026	0.228	0.228	0.004	0.242	0.242	-0.017	0.235	0.235	0.011
	(0.150)	(0.137)	(0.083)	(0.165)	(0.147)	(0.086)	(0.174)	(0.155)	(0.091)	(0.159)	(0.146)	(0.087)
Intangible	-0.216	-0.216	-0.218**	-0.236	-0.236	-0.248***	-0.232*	-0.232	-0.322***	-0.217	-0.217	-0.291***
	(0.142)	(0.172)	(0.104)	(0.144)	(0.177)	(0.103)	(0.138)	(0.176)	(0.103)	(0.138)	(0.173)	(0.103)
LogFirmage	-0.009	-0.009	-0.010	-0.008	-0.008	-0.005	0.005	0.005	0.007	0.001	0.001	0.001
	(0.037)	(0.036)	(0.022)	(0.038)	(0.038)	(0.022)	(0.038)	(0.037)	(0.022)	(0.036)	(0.037)	(0.022)
Intercept	-0.053	-0.053*	0.204*	0.031	0.031	0.176	-0.060	-0.060	0.109	-0.108	-0.108	0.147
	(0.212)	(0.190)	(0.115)	(0.224)	(0.197)	(0.115)	(0.220)	(0.196)	(0.115)	(0.217)	(0.192)	(0.114)
Number of obs	431	431	431	429	429	429	403	403	403	405	405	405
Prob > F	0.0000			0.0000			0.0000			0.0000		
Wald chi2		177.07	94.48		163.49	98.47		138.07	121.12		151.91	117.87
Prob > chi2		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000
VIF	1.5			1.49			1.51					

Notes: The asterisk * (**) (***) indicates significance level at the 10, 5 and 1 % level, respectively. The standard errors are robust to heteroscedasticity.

In terms of the other managerial traits variables, duality and manager's ownership are found to have no relationship with cash holdings and deviation. Manager's age and manager's education have positively significant impacts on cash holdings and also on deviation. For manager's tenure, it is found that tenure has a negative effect on both cash holdings and deviation.

Regarding the other control variables, there is very strong evidence whereby all models indicate the positive impact of ownership concentration and Z-score on cash holdings and also deviation. With leverage, the regression results show that just the first proxy of leverage is found to have a negative impact on cash holdings, but no impact on the deviation. For the second proxy of leverage, there is no evidence to confirm the relationship between leverage and cash holdings or deviation. Firm size and intangible assets are indicated as having weak negative relationships with cash holdings, whereby only one model supports these results. Meanwhile, it is shown that both firm size and intangible assets have strong impacts on deviation. For profitability, there are only two models showing a positive effect of profitability on cash holdings, but no evidence showing that it has an association with deviation. For other variables including board size, firm value, dividend, change in share price and firm quality, there is no evidence showing any relationship between those variables and cash holdings or deviation.

2.4.4.4. *Determinants of cash holdings: The case of general control variables*

We run the regression for cash holdings with other general control variables in the models from the previous section to examine the determinants of cash holdings in the basic models that have been demonstrated significantly in many previous studies. The main purpose of this section is to test the impact of the general control variables on cash holdings in the context of Vietnam and then compare this to the relationship between them and cash holdings in other economies.

In this section, the panel data is used to run the regressions. The data is available from 2005 to 2016 for all non-finance Vietnamese firms. Therefore, the data type in this section is panel data. There are two types of regressions that were run for this part, namely GLS and FE (the results are shown in table 2.7). Actually, both RE and FE are tested, but the Hausman test indicated that FE is suitable in this case.

INDEPENDENT VARIABLES	DEPENDENT VARIABLE Cash							
	GLS (31)	FE (32)	GLS (33)	FE (34)	GLS (35)	FE (36)	GLS (37)	FE (38)
Firmvalue1	0.003	-0.005			0.000	-0.007		
	(0.005)	(0.005)			(0.005)	(0.005)		
Firmvalue2			0.007	-0.010**			-0.009*	-0.014**
			(0.005)	(0.005)			(0.005)	(0.005)
Dividend	0.003	-0.001	0.002	-0.001	0.003	-0.001	0.002	-0.001
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
ZScore	0.011***	0.008***	0.011***	0.009***	0.013***	0.009***	0.014***	0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Leverage1	-0.199***	-0.068***	-0.199***	-0.061***				
	(0.012)	(0.016)	(0.013)	(0.017)				
Leverage2					-0.031***	-0.007**	-0.030***	-0.006*
					(0.002)	(0.003)	(0.003)	(0.003)
Sharepricechange	0.006**	0.011***	0.005	0.012***	0.005*	0.011***	0.007**	0.012***
	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
Firmsize	0.017***	0.003	0.016***	-0.003	0.010***	0.001	0.010***	-0.005
	(0.003)	(0.007)	(0.003)	(0.007)	(0.003)	(0.007)	(0.003)	(0.007)
Firmquality	-0.001	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.000
	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
Profitability	0.296***	0.117***	0.279***	0.132***	0.285***	0.124***	0.298***	0.141***
	(0.033)	(0.033)	(0.034)	(0.034)	(0.034)	(0.033)	(0.034)	(0.034)
Intangible	-0.193***	-0.237***	-0.205***	-0.265***	-0.211***	-0.234***	-0.216***	-0.261***
	(0.045)	(0.058)	(0.046)	(0.060)	(0.046)	(0.058)	(0.046)	(0.061)
Intercept	-0.027	0.102	-0.024	0.146*	0.007	0.109*	0.011	0.157
	(0.026)	(0.058)	(0.027)	(0.060)	(0.027)	(0.058)	(0.027)	(0.059)
Number of obs	4003	4003	3886	3886	4008	4008	3890	3890
Wald chi2	1521.76		1488.24		1382.98		1360.90	
Prob > chi2	0.0000		0.0000		0.0000		0.0000	
Prob > F		0.0000		0.0000		0.0000		0.0000

Notes: The asterisk * (**) (***) indicates significance level at the 10, 5 and 1 % level, respectively. The standard errors are robust to heteroscedasticity.

Table 2.7: Regression results for the cash holding determinants: general control variables

The total number of observations is from 3886 to 4003, depending on each model. The regression results show that almost all the control variables in the model are suitable to explain cash holdings. Only two variables, namely dividend and firm quality, are demonstrated to have no evidence or a relationship with cash holdings. The results of Pro>chi2 for GLS and Prob>F for FE are 0.0000 indicate that the models are suitable and very strong. Except for dividend and firm quality, which are insignificant for cash holdings, for all other significant variables, the significance levels are also very high at 1%. Only firm value is less significant than the others, with less evidence shown.

2.4.4.5. Endogeneity problems and GMM testing

One of the important problems need to be considered carefully is endogeneity, in which if there is a problem of endogeneity in the model, the OLS, GLS become less strong estimations. Hence, we need to identify the endogeneity in the model and apple more appropriate regression estimations. Endogeneity is in which an explanatory variable is correlated with the error term or other omitted variables. In the empirical regression model of this study, a number of control variables, namely firm value, dividend, leverage and profitability, might be explained by other variables. Specifically, firm value can be

determined by firm size, debt to equity ratio, return on sales, tangible assets, and board size (Wang, 2018), or by profitability, firm size, leverage, sales growth, liquidity, board composition, board size, and state ownership (Giriati, 2016). Dividend can be explained by yield, firm size, profitability, debt to equity ratio, leverage and liquidity (Patra et al., 2012), or by profitability, firm risk, net cash flow, tax, institution ownerships, firm growth and firm value (market to book value) (Amidu and Abor, 2006). Leverage can be impacted by assets maturity, firm size, profitability, tangible assets, tax rate and net operating loss (Barclay et al., 2003). Profitability (measured by ROA) can be influenced by firm size, initial capital and firm age, as in the research of Kuncová et al. (2016), or by firm age, firm size, volume of capital, leverage and loss ratio (Malik, 2011), or by firm size, leverage, liquidity and firm age (Doğan, 2013). Therefore, to address endogeneity, we use the dynamic panel-data estimation, the generalised method of moments (GMM) estimation method (Blundell and Bond, 1998). In fact, the use of GMM brings two advantages; firstly, the GMM method is more effective in controlling for the potential endogeneity problem than the fixed-effect estimation method, because fixed-effect estimation does not address the endogeneity problem in its regression. Meanwhile, it is believed that endogeneity exists in the research model. Therefore, the GMM method is a good way to get other predicted results after addressing the endogeneity problem, which makes the empirical results in determining the determinants of cash holdings become stronger. Secondly, the GMM method is also believed to address the dynamic nature of the cash holding behaviour of firms.

Firstly, for the cross sectional model with sub sample size, the instrumental variables GMM method is applied and the regression results are showed in table 2.8 below. From the regression results, all proxies of overconfidence are found with similar results from GLS regressions. However, among six identical models, there are two models GMM (39) and GMM (40) are considered as inappropriate with the results of *Wald Chi2* quite low *and Prob > Chi2* equals 0.1147 and 0.4937. Although, there are two models with not good results in *Wald Chi2 and Prob > Chi2,* however, all models supports for the results of GLS and OLS regression before, thus the regression result of all overconfidence proxies on Cash holdings are still believed as strongly reliable results. For other explanatory variables, there is very little evidence indicate the relationship between them and cash holdings. Seeming that only managerial age is showed having a strong impact on cash holdings.

INDEPENDENT VARIABLE	DEPENDENT VARIABLE					
	GMM (39)	GMM (40)	GMM (41)	GMM (42)	GMM (43)	GMM (44)
MAIN EXPLANATORY VARIABLES						
Overconfidence1	-0.239**					
	(0.123)					
LogOverconfidence2		-0.298***				
		(0.097)				
Overconfidence3			-0.037**			
			(0.019)			
Overconfidence4				-0.082**		
				(0.036)		
Overconfidence5					-0.086***	
					(0.036)	
Overconfidence6						-0.052***
						(0.015)
OTHER MANAGERIAL TRAITS EXPLANATORY VARIABLES						
Duality	-0.094	-0.044	-0.152	-0.005	-0.067	-0.074
	(0.118)	0.082	0.146	0.103	0.103	(0.102)
LogMaAge	-1.044**	-0.802*	-1.007*	-0.908*	-0.967**	-1.179***
	(0.522)	0.460	0.557	0.499	0.451	(0.458)
LogTenure	0.092	0.062	0.101	0.051	0.078	0.085*
	(0.061)	0.057	0.067	0.076	0.055	(0.050)
LogMaEdu	0.078	0.056	0.064	0.006	0.078	0.056
	(0.106)	0.107	0.115	0.130	0.102	(0.091)
MaOwnership	0.197	0.190	0.511	0.141	0.115	0.213
	(0.566)	0.711	0.658	1.025	0.507	(0.504)
OTHER CONTROL VARIABLES						
OConcentration	-0.094	-0.028	-0.074	-0.067	-0.063	-0.110
	(0.110)	(0.094)	(0.112)	(0.116)	(0.088)	(0.089)
LogBoardsize	-0.090	-0.159*	-0.105	-0.103	-0.043	-0.074
	(0.128)	(0.094)	(0.142)	(0.090)	(0.121)	(0.116)
Firmvalue2	0.157	0.065	0.228	0.051	0.111	0.123
	(0.223)	(0.178)	(0.267)	(0.256)	(0.197)	(0.188)
Dividend	0.027	0.030	0.040	0.025	0.027	0.027
	(0.041)	(0.027)	(0.053)	(0.033)	(0.031)	(0.031)
ZScore	-0.011	-0.011	-0.013	-0.005	-0.007	-0.010
	(0.010)	(0.028)	(0.012)	(0.040)	(0.009)	(0.009)
Leverage1	-0.308	-0.243	-0.346	-0.179	-0.249	-0.303*
	(0.195)	(0.219)	(0.222)	(0.270)	(0.173)	(0.166)
Sharepricechange	-0.025	-0.032	-0.009	-0.036	-0.032	-0.039*
	(0.023)	(0.026)	(0.022)	(0.021)	(0.023)	(0.022)
Firmsize	-0.022	0.002	0.001	-0.009	-0.022	-0.017
	(0.043)	(0.034)	(0.046)	(0.046)	(0.039)	(0.036)
Firmquality	-0.002	0.000	0.001	0.002	0.000	-0.001
	(0.006)	(0.007)	(0.007)	(0.013)	(0.005)	(0.005)
Profitability	-0.058	0.482	-0.554	0.302	0.133	0.062
	(1.043)	(0.526)	(1.266)	(0.707)	(0.956)	(0.894)
Intangible	0.290	-0.035	0.378	0.600**	0.244	0.282
	(0.440)	(0.128)	(0.506)	(0.262)	(0.399)	(0.369)
LogFirmage	-0.025	-0.048	-0.079	0.010	-0.022	0.011
	(0.063)	(0.065)	(0.076)	(0.075)	(0.060)	(0.051)
Intercept	2.203**	1.896*	1.878*	1.748	1.942**	2.305***
	(1.120)	(1.036)	(1.123)	(1.140)	(0.933)	(0.940)
Number of obs	87	81	87	78	87	87
Wald chi2	27.78	54.36	19.44	77.32	39.24	59.37
Prob > chi2	0.1147	0.0001	0.4937	0.0000	0.0062	0.0000

Notes: The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1 % level, respectively. The standard errors are robust to heteroscedasticity.
Note that all alternative independent variables such as Firmvalue2 and Leverage2 are in turn interchangeable to models. The results revealed the same

Table 2.8: The instrumental variables GMM estimation for cross-sectional model of cash holdings

Secondly, for the panel data, the results are presented in table 2.9 below. The results of *Wald Chi2, Prob > Chi2,* and Hansen test suggest that the model is appropriate. In fact, Hansen test is used to test the appropriation of instrumental variables in the regression model, Hansen test with H_0 is instrumental variable is exogeneity, meaning that it is uncorrelated with error term of the model, therefore the higher value of P value of Hansen

test, the better of the model is. In terms of the results of the first-order autocorrelation (AR1) and the second-order autocorrelation (AR2), it is showed that there is only evidence of the first-order autocorrelation and no evidence of second-order autocorrelation. The omitted intercept might indicate that there might be an

In GMM models of panel data, the regression results show that firm value, change in share price and intangible assets have no association with cash holdings. Meanwhile, dividend, leverage and profitability are found to strongly impact on cash holdings whereby all models show that dividend and profitability have positive impacts on cash holdings at an almost 1% level of significance, and leverage has a negative impact on cash holdings at the 1% significance level. The positive impact of cash holdings is also found with the variable of Z-score and firm size. However, with firm size, only one out of the four models supports this significant relationship. For firm quality, it is found that firm quality negatively impacts on cash holdings. This finding is supported by three models.

INDEPENDENT VARIABLES	DEPENDENT VARIABLE			
	CASH			
	GMM (61)	GMM (62)	GMM (63)	GMM (64)
Firmvalue1	0.011		0.007	
	(0.013)		(0.014)	
Firmvalue2		0.017		0.006
		(0.014)		(0.016)
Dividend	0.010**	0.010***	0.009***	0.010***
	(0.005)	(0.004)	(0.004)	(0.003)
ZScore	0.006**	0.006	0.009***	0.010***
	(0.003)	(0.004)	(0.003)	(0.004)
Leverage1	-0.234***	-0.218***		
	(0.040)	(0.042)		
Leverage2			-0.036***	-0.029***
			(0.008)	(0.008)
Sharepricechange	-0.007	-0.005	-0.011	-0.007
	(0.007)	(0.007)	(0.007)	(0.007)
Firmsize	0.028**	0.024	0.014	0.010
	(0.013)	(0.014)	(0.014)	(0.013)
Firmquality	-0.003***	-0.002*	-0.003***	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Profitability	0.291***	0.260***	0.320***	0.282***
	(0.102)	(0.102)	(0.109)	(0.108)
Intangible	-0.114	-0.004	-0.144	-0.059
	(0.128)	(0.138)	(0.124)	(0.131)
Intercept	-0.042	-0.039	-0.034	0.0004
	(0.110)	(0.115)	(0.103)	(0.101)
Number of obs	3990	3873	3995	3877
Wald chi2	195.38	177.04	915.87	973.850
Prob > chi2	0.000	0.000	0.000	0.000
AR (1)	0.000	0.000	0.000	0.000
AR (2)	0.172	0.104	0.277	0.161
Hansen test	0.503	0.454	0.534	0.667
Notes: The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1% level, respectively.				

Table 2.9:Two-step system GMM estimation for the cash holding determinants

2.4.4.6. Findings from answering the open-ended questions

A total of seven open-ended questions were asked; however, as the main purpose of those questions was to record the manager's voice pitch, only two questions were constructed to

be relevant to cash holdings. The other questions are planned for use in future studies if needed. Regarding the two questions related to cash holdings, namely half of question 1 and question 2, it is found that about 70% of respondents confirmed the important role of holding cash for management operations. Furthermore, about 63% of respondents believed that cash holdings have a significant impact on firm performance, hence they are careful when making decisions related to cash holdings. Therefore, this finding can support the regression results on the impact of managerial overconfidence on cash holdings. Those who are overconfident managers might tend to hold less cash to invest more in investment projects to earn more money; however, they also understand the role of cash holdings in corporate management, so might not hold the cash level far from the target cash holding level.

2.4.5. Discussion

Our findings are consistent with several previous studies stating that firms with overconfident managers tend to hold less cash. For example, Huang-Meier et al. (2016) state that optimistic managers normally hold less cash reserves for precautionary savings, inventories and receivables. In contrast, non-optimistic managers have been shown to tend to hold larger amounts of cash due for precautionary purposes (Deshmukh et al., 2010, Huang-Meier et al., 2016); Malmendier et al. (2007) and Lin et al. (2008) also indicated that overconfident managers prefer to use internal financing sources over other sources; also, Deshmukh et al. (2013) believe that external financing is costly and that overconfident managers prefer internal sources, which means they might hold less cash and use cash for investment purposes. The six proxies used to represent overconfident managers showed the same findings in all regression models. This suggests that overconfident managers have a strongly negative relationship with cash holdings. These findings support the first hypothesis of the study, so this hypothesis is accepted.

The negatively significant relationship between managerial overconfidence and cash holdings was also tested with both the small sample size and the larger extended size, which is a very strong confirmation. There is no doubt that managerial overconfidence has a significantly negative effect on cash holdings.

For the second hypothesis, after finding the relationship between overconfidence and cash holdings, the optimal cash holding level was found by the fitted value, and a deviation between the actual cash holdings and the optimal value are identified. The results of all

models demonstrate that there is a negatively significant relationship between deviation and overconfident managers, whereby the greater the overconfidence, the lower the deviation between the actual cash holding levels and the optimal level. It sounds interesting that overconfident managers seem not to have much bias in cash holdings level compared to the optimal level. The findings are supported by the answers of most of the interviewed managers. When asking about cash holdings, over 70% of respondents answered that they understand the importance of cash in business operations, hence they make decisions about cash holdings quite carefully. Therefore, even though overconfident managers tend to hold less cash, they do not tend to take the actual cash level far from the optimal level.

It can be seen that the use of six different proxies of managerial overconfidence is aimed at mitigating the bias in the regression results if only using one proxy. With six different proxies, the different targeted group of managers are also identified. In fact, for the first proxy and the second proxy, the managers can be CEO, CFO, CAO or vice executive director; for the third proxy and the fifth proxy, the research examines the CEO only; finally, for the fourth proxy, the research subject is the whole board of management. We believe that releasing a future plan with predicted earnings should be set up by the whole board of management. Therefore, the use of different targeted managers helps to reflect exactly the overconfidence level of managers of firms and ensures confident regression results.

Beside overconfidence and deviation, the study also investigates the impact of other managerial attributes on cash holdings. The findings indicate that there is no relationship between cash holdings and duality for both the small sample size and the larger sample size. This finding is similar to that of Ozkan and Ozkan (2004), who found no relationship between these two variables. Furthermore, it is also found that there is no evidence suggesting the relationship between tenure, manager's education, and manager's ownership in the small sample size. These findings are different from the findings of Liu et al. (2014) and different from the findings of Opler et al. (1999), who stated that management ownership has a positive impact on cash holdings. Meanwhile, Ozkan and Ozkan (2004) indicated that this relationship depends on the identity of the firm's controlling shareholders. Accordingly, they state that the relationship can become positive at higher levels of managerial ownership. However, in the larger extended sample size, the regression results indicate that both tenure and manager's education have a significant

relationship with cash holdings, whereby tenure negatively impacts on cash holdings and managers' education positively impacts on cash holdings. The results of tenure, in this case, are consistent with the findings of Liu et al. (2014). Only managerial age is identified as having both a positive and negative effect on cash holdings in both the small sample size and larger extended size.

Regarding the models of deviation, all variables of managers' traits are illustrated as having a significant impact on the deviation. These results are the first results studying the relationship between manager's traits and the deviation between the actual cash level and the optimal level of cash holdings. Therefore, this is a premise for future research in this field.

For the control variables, in the model of the case of general control variables, except for dividend and firm quality, all other control variables are proved having a significant impact on cash holdings, which is similar to the studies of Kim et al. (1998), Schnure (1998), Opler et al. (1999), Faulkender (2002), Omet and Maghyereh (2003), Bigelli and Sánchez-Vidal (2012) and Liu et al. (2014). The result from Z-score is similar to the study of Faulkender (2000) and Faulkender (2002), who stated that riskier firms tend to hold more cash. Opler et al. (1999) demonstrated that firms that pay dividends hold less cash; however, the findings in our study are different, and they are also different to the studies of Lins et al. (2010), Basil (2013) and Bigelli and Sánchez-Vidal (2012), stating that in firms there is a positive relationship between dividends and cash holdings.

To address the problem of endogeneity, the GMM method shows quite similar results with the GLS and FE regressions. Specifically, for all models with different proxies of control variables, it is found that dividend, Z-score, leverage, firm size, firm quality and profitability significantly impact on cash holdings, whereby dividend, Z-score, firm size and profitability are illustrated having positive relationships with cash holdings; meanwhile, leverage and firm quality are suggested as leading to a negative effect on cash holdings. Those results are consistent with the GLS and FE estimations in terms of Z-score, firm size, profitability, and leverage. Except for the fact that dividend and firm quality are illustrated as having no impact on cash holdings, and firm value and intangible are indicated as having a significant impact on cash holdings in the GLS and FE regressions, they are different in the results of GMM regression. Additionally, the GMM method also demonstrates that there is a positive significant impact between cash holdings at time t-1

and cash holdings at time t.

Throughout all regression models, we can once again confirm that there is a negative relationship between managerial overconfidence and cash holdings; however, this does not mean that managerial overconfidence leads to a higher bias between the actual cash holding level and the optimal cash holding level. That means there is no difference between Vietnamese managers and other managers from different countries illustrated from prior studies in terms of the relationship between managerial overconfidence and cash holdings; however, the difference might stem from the finding of relationship between managerial overconfidence and the deviation between the targeted cash holding level and the actual cash holding level. In fact, there is no comparison for this test, because this test is the first test to test the relationship between managerial overconfidence and the deviation between the targeted cash holding level and the actual cash holding level. We can say that the finding in this case is very interesting when it found that managerial overconfidence tend to hold less cash but do not make the higher bias between the targeted cash holding level and the actual cash holding level. Future researches might clarify this finding when do similar studies in different countries to make comparisons. Additionally, all proxies of managerial overconfidence produce consistent results, illustrating that the new measurement of voice pitch and the comprehensive index are appropriate measures compared to all other popular measurements. We believe that it is an important contribution from this study to the existing body of research.

2.5. Conclusion

By mainly studying 123 Vietnamese listed firms, our research indicates that managerial overconfidence has a significant negative impact on cash holding levels. The result was also tested again in a larger extended sample size to strongly confirm this relationship.

In this study, managerial overconfidence is measured by six different proxies to prevent bias in the regression results. Those proxies include analysing voice pitch, using a psychometric test, determining photo sizes, exploring bias in earnings forecast, noting the gender of managers, and the comprehensive constructed from prior five proxies, collected from 123 direct interviews with managers and annual reports, which makes the study becomes different from the previous studies. Furthermore, the proxy of bias in earning forecast is also used in the extended sample size as this data type is available for collection from the annual report. From the five different proxies of managerial overconfidence, three

different targeted groups of managers are used, including CEO, CFO, CAO, or vice executive directors for the first and the second proxy, only CEO for the third, the fifth proxy, and the whole board of directors for the fourth proxy, and very importantly, the sixth proxy is the combination of all prior proxies, which including all types of manager in the board of management. The different research subjects are used to reflect very strong, confident and consistent regression results from the different models.

The results from all models of the different overconfidence proxies from both the small sample size and the larger extended sample size show that overconfident managers tend to hold less cash than non-overconfident peers with proxies of having value 1 and 0 and less-overconfident peers with proxies of Overconfidence1, Overconfidence2, Overconfidence3 and Overconfidence6. Furthermore, the research also finds that overconfident managers tend to negatively affect the deviation between actual cash holding levels and optimal cash levels. That means that overconfident manager might not lead to a high deviation between the actual cash holding levels and the optimal cash levels. It seems interesting that managerial overconfidence leads to holding less cash but do not lead to a high deviation in holding the actual cash level compared to the optimal level of cash holdings. Importantly, this is confirmed by all models with different proxies of managerial overconfidence and also by both two types of sample size, which makes the findings become more confident. Moreover, more than 70% of the managers' answers stated that they understand the importance of holding cash in the firm, thus they are normally careful when making decisions about cash holdings.

Additionally, the study also demonstrates there is a significant relationship between the manager's age, tenure, and manager's education with cash holdings in both the small sample size and larger extended size. Meanwhile, almost all managers' traits are proved to have a significant impact on deviation, namely duality, manager's age, tenure, manager's education and manager's ownership.

Besides the main explanatory variable, the empirical model indicates that, except for dividend and firm quality, all other control variables such as firm value, Z-score, leverage, change in share price, firm size, profitability and intangible assets have significant impacts on cash holdings that are similar to most of the previous studies.

In terms of the contributions of this study, they can be listed as consisting of the use of six different proxies of managerial overconfidence, the use of different sample sizes and

research subjects, which helps to mitigate the bias in the regression estimations, the use of voice pitch through face-to-face interviews with top-line managers of Vietnamese listed firms, and the constructing of the comprehensive index from five different overconfidence proxies. Furthermore, the similar empirical results between the different models indicate that voice pitch and the comprehensive index are strong and appropriate measurements of managerial overconfidence concerning the findings of the relationship between cash holdings and managerial overconfidence and the relationship between managerial overconfidence and the deviation between the optimal cash holding level and the actual cash holding level, and finally, the findings of the impacts of manager's traits with cash holdings and deviation. We also believe that the findings of our research have a significant contribution to practice corporate management when providing a suggestion for the owner of firms in assigning appropriate managers who directly manage firms.

Further research might support our findings by investigating the impact of managerial overconfidence on cash holdings and deviation for longer research periods with different data types such as time series and panel and also in different countries. Additionally, extended studies might be based on our research to investigate the relationship of managerial overconfidence on many other aspects of corporate management.

CHAPTER 3: DEBT MATURITY AND MANAGERIAL OVERCONFIDENCE: EVIDENCE FROM VIETNAM

ABSTRACT

This study examines the relationship between debt maturity and managerial overconfidence. By directly investigating 123 non-financial Vietnamese firms listed on the stock exchange market using interviews with top managers and with a double check through an extended sample size of 646 non-finance Vietnamese firms, the evidence shows that managerial overconfidence has a significant impact on debt maturity. A higher level of overconfidence leads to a higher percentage of using long-term debt in the debt structure. Interestingly, the empirical results also indicate that the more overconfidence there is, the more the probability of deviation in predicting the optimal long-term debt level in firms.

3.1. Introduction

Modigliani and Miller (1958) state that the choices of different financing instruments might not be a concern in corporate management if a perfect capital market exists. However, in fact, the imperfection exists among all markets due to agency cost (Jensen and Meckling, 1976, Myers, 1977), information asymmetry (Myers, 1984, Myers & Majluf, 1984) and taxes (Modigliani and Miller, 1963). Regarding agency costs, Myers (1977) and Barnea et al. (1980) demonstrate that short-term debt is more effective than long-term debt. For the information asymmetry problem, Mitchell (1991) indicates that short-term debt helps to reduce adverse selection costs. However, Brick and Ravid (1985) show that the value of firms can be increased by using long-term debt, which helps to reduce tax liabilities. Therefore, it is necessary to be careful in making the decision to choose the appropriate capital structure and also the maturity of capital. The different kinds of capital lead to the different cost of capital, and hence affect the profitability of firms. Accordingly, debt maturity can be seen as a key factor in corporate management, thus this study conducts research in terms of debt maturity to examine the determinants of debt maturity. In corporate management, debt maturity is used to mitigate the costs stemming from market imperfection, such as short-term debt used to resolve debt agency conflicts (Myers, 1977). Flannery (1986) also confirms that short-term debt reflects the quality of the firm since using short-term debt might lead to high transaction costs for each rolling debt, but this saves costs as the cost of short-term debt is normally less than that of the long-term debt.

Generally, short-term debt and long-term debt both bring advantages and disadvantages as Guedes and Opler (1966) suggest that firms can take a risk if they use short-term debt for their projects due to the short maturity, which might make it hard for firms to extend the debt. However, using long-term debt might lead to a sacrifice of a firm's profit due to the mismanagement of resources during the period after cash flows return from projects but before they are due to debt-holders. Investigating the determinants of debt maturity can be seen as one of the important studies in both theoretical and practical aspects.

There are four theories that are normally used to explain the choices of debt maturity, namely agency cost theory, the matching principle, signalling theory, and tax and interest rate theory. In terms of the agency cost theory, stemming from the agency problem, there is a conflict between the interests of debt-holders and equity holders. Hence, the use of short-term debt, lower financial leverage and more restrictive covenants to debts can mitigate the

underinvestment problems (Myers, 1977). Accordingly, it is believed that with short-term debts it is easier to renew the debt contracts before agency costs can create any change to the value of underlying assets. Furthermore, according to Barclay and Smith (1995), during the high growth period, and under the impact of the agency problem, firms have more preference for using short-term debts. Following the matching principle, Myers (1977) also explains that the maturity of debts should be matched with the maturity of assets. This means that, for each investment project, the new debts should be issued with the duration time that is the same as the project. The matching principle also states that the refinancing cost of short-term debt is not expensive compared to long-term debt, thus firms can save money by issuing short-term debts. However, the matching principle also believes that short-term debt is riskier than long-term debt as it might not have the net working capital (Kolb, 1987). Regarding signalling theory, Flannery (1986) shows that the effects of information asymmetries on financing costs can be reduced by using short-term debt. Furthermore, according to signalling theory, the signals from the high reputation and good quality of firms might help firms find it easier to access short-term debt with a low risk of refinancing (Flannery, 1986, Kale and Noe, 1990). By contrast, Lucas and McDonald (1990) state that after an excellent time of operation, firms that have benefited from equal investors are more likely to issue longer and more mispriced debts. However, findings from the study of Diamond (1993) indicate that there is a non-linear relationship between debt maturity and firm quality, meaning that good and bad quality firms tend to use more short-term debt, while moderate firms prefer to use moderate types of debt maturity. Finally, according to tax theory and interest rate theory, it is believed that during the time of an upward sloping of the interest rate, the use of long-term debt might help to increase the value of the firm (Brick and Ravid, 1985). Furthermore, the higher interest rate from long-term debt is seen as an advantage for firms due to tax shield benefits. Morris (1976) suggests that short-term debt can be preferred because it helps to reduce asset risk when the interest rate has the same movement with revenues or the value of the asset.

Throughout much of the relevant literature, many factors have been identified that have significant impacts on debt maturity. For example, according to Titman and Wessels (1988), the preference of using short-term debt can depend on the size of firms. Accordingly, smaller firms might issue more short-term debt to mitigate the flotation costs from issuing long-term debt. Supporting this conclusion, Rauh (2006) explains that small

firms normally have to face the problem of financial constraints; therefore, short-term debt is easier to access for those firms than long-term debt. Barclay and Smith (1995) believe that large firms with few growth options tend to have more long-term debts. Besides that, debt maturity is also explained as being determined by size, profitability, and credit ratings (as in the study of Guedes and Opler (1996)). Similarly, Ozkan (2000) indicates that size and asset maturity have positive impacts on debt maturity, while growth opportunities are illustrated to negatively affect debt maturity. These scholars also attempted to find the association between debt maturity and signalling theory, but there is no evidence indicating any relationship between them. In another study by Mitchell (1993), it is explained that firms tend to issue more short-term debts if they have to face more business risks; further, similar to the later studies from Barclay and Smith (1995) and Ozkan (2000), Mitchell (1993) also found that short-term debt might be issued more when firms have more growth opportunities. Another finding also confirmed by Mitchell (1993) indicates that firms with high-quality projects might prefer using short-term debt. From a different approach, debt maturity is found to have a positive relationship with asset maturity and negative relationships with earnings surprises, corporate tax rate and firm risk (Stohs and Mauer, 1996). From a different point of view, Antoniou et al. (2006) indicate that besides firm-specific factors, country-specific and macroeconomic factors are also believed to have a significant relationship with debt maturity.

One of the factors affecting corporate management decisions mentioned in a number of recent studies is managerial overconfidence. It is stated that managerial overconfidence has a significant impact on corporate management. Particularly overconfident managers tend to underestimate investment projects (March and Shapira, 1987, and Langer, 1975), increase the cost of external financing (Heaton, 2002), hold less cash, prefer to use internal finance sources over others (Malmendier et al., 2008 and Lin et al., 2008), and use a tight policy for dividends (Deshmukh et al., 2013). Generally, it can be seen that overconfident managers tend to make riskier decisions that might have negative effects on the issues of corporate management. Even though there have been a number of studies mentioning the relationship between managerial overconfidence and several aspects of corporate management, few papers have looked at the aspect of debt maturity in the relationship with managerial overconfidence. Therefore, this study attempts to examine the effect of managerial overconfidence on debt maturity. It is expected that firms with managerial overconfidence

tend to hold more short-term debt in the capital structure as this type of debt is seen as riskier than long-term debt. Furthermore, the second objective in investigating the effect of managerial overconfidence on debt maturity is attempting to examine the relationship between managerial overconfidence and the deviation between the actual level of debt maturity and the optimal level of debt maturity. We predict that the relationship between managerial overconfidence and the deviation between the actual level of debt maturity and the optimal level of debt maturity is positive.

Overconfidence is defined as describing people who normally misjudge themselves regarding their abilities, knowledge and predictions (Ackert and Deaves, 2010). Overconfident people are believed to always think they are better than the average (Larwood and Whittaker, 1977, Svenson, 1981, and Alicke, 1985). In the specific term of managerial overconfidence, it is described that managerial overconfidence tends to overestimate the growth rate of return and growth rate of assets as well as underestimate the riskiness of these two aspects, which might lead to unexpected results (Hackbarth, 2008, 2009). Moreover, Heaton (2002) also defines overconfident managers are more likely to systematically overestimate the probability of good firm performance and over-predict the results of investment opportunities (Baker and Wurgler, 2012). Even overconfident managers are illustrated as having no realistic beliefs in types of projects (Landier and Thesmar, 2009).

The contribution of this study is investigating the relationship between overconfident managers and debt maturity. More importantly, the proxies used to measure overconfidence in previous studies seem to be indirect methods through measuring secondary data, such as the number of stock options held by managers (Malmendier and Tate, 2005, 2008), media coverage (Hayward and Hambrick, 1997, Malmendier and Tate, 2008, Brown and Sarma, 2006, Hribar and Yang, 2016), forecasted earning bias (Lin et al., 2005, Huang et al., 2011), and photos sizes, or merely the use of psychometric testing (Graham et al., 2013). This research offers a novel approach by using voice pitch to measure managerial overconfidence. Voice pitch is collected through 123 direct interviews with top managers of non-financial Vietnamese firms. Furthermore, photographs of firms' CEO and more importantly, there is a using of a comprehensive index of overconfidence from the measurement of voice pitch and the visibility of CEO's photo in annual reports that is

constructed by combining these two measurements are also employed to double check the impact of managerial overconfidence on debt maturity.

Based on the objectives, this study aims to investigate the impact of managerial overconfidence and debt maturity, and also to extend the study to examine the impact of managerial overconfidence on the deviation between actual debt maturity level and optimal debt maturity level. Therefore, two research questions constructed as follows.

Research questions

1. *What are the impacts of managerial overconfidence on debt maturity?*
2. *Do overconfident managers lead to higher deviations in the target debt maturity?*

This chapter is organized as follows. The following part provides a review of the literature, presenting an overview of the motives for and determinants of debt maturity from previous studies. After that, the methodology section is mentioned to describe the appropriate research method for the research. Next comes the section on the empirical results with the descriptive statistics, correlation matrix and regression analysis. Finally, the findings and discussion as well as the conclusion are analysed and summarised.

3.2. Literature review

3.2.1. Managerial Overconfidence: Theory, Empirical and Measurement

3.2.1.1. Definition of overconfidence

Overconfidence is mentioned widely in many psychology studies, but recently, it has also been linked to different fields such as management and finance. To examine the relationship between managerial overconfidence and cash holdings in this study, first, we go to the definition of overconfidence that is often mentioned in many previous studies.

Overconfidence is the term referring to people who normally overstate and misjudge their abilities, knowledge and predictions (Ackert and Deaves, 2010). Larwood and Whittaker (1977), Svenson (1981), and Alicke (1985) mentioned overconfidence and believed that overconfident people tend to overrate themselves and relatively overestimate their acumen compared to the average. Additionally, in the study of Gervais et al. (2011), they also agree with these conclusions and give one more conclusion of overconfidence, in that it refers to people who have a more wrong interpretation of economic information. Following that, overconfident people normally make too confident decisions that lead to unexpected

outcomes. For example, Miller and Ross (1974) indicate that bad results might stem from overconfidence when they believe too strongly about the success of a matter and then wrongly tale action. In fact, the effect of overconfidence might create negative results in each particular circumstance, for example in the general economic field if they are managers and regularly need to make important decisions (Camerer and Lovallo, 1999). Malmendier et al. (2011) prove that overconfident managers tend to over-predict the mean of the net income from investments, and hence might lead to a greater net loss in investment projects.

There are a number of terms used to describe and explain more clearly overconfidence in previous papers such as miscalibration, better-than-average effect and illusion of control (Fischhoff et al., 1977, Taylor and Brown, 1988, Langer, 1975). Regarding the term of miscalibration, by conducting an experiment, Fischohoff et al. (1977) found that overconfident people tend to answer very confidently and quickly all intermediate and extremely difficult questions. Due to their overconfidence about their knowledge, their answers are negatively affected. In the same way as detecting overconfidence, Ben-David et al. (2013) use interviews with a number of questions to ask CEOs' predictions for the future stock market. Accordingly, overconfident managers can be found through the bias of prediction. In terms of the better-than-average effect, this term is used to refer to people who always believe that they are better than others on average regarding their knowledge, abilities, and personal attributes (Taylor and Brown, 1988, Svenson, 1981). In terms of the illusion of control, Langer (1975) points out that overconfident people tend to overestimate their control of matters and the results. Following that, Langer (1975) believes that even when the problems are uncontrollable, overconfident people are still very confident in controlling the outcomes.

Excessive optimism and self-attribute bias are other terms used to define overconfidence, according to Gervais and Odean (2001), Miller and Ross (1975), and Weinstein (1980); these two terms refer to people who usually make mistakes and fail but hardly learn or gain experience from those failures and might repeat the same problems in the future. In terms of optimism, some papers state that it is different from overconfidence, however, most studies believe that they are indistinguishable and can be used interchangeably (Gervais, 2010, Shefrin, 2010). The similar meaning between overconfidence and optimism is quite clear and is illustrated through a number of papers when they mention the definitions of

optimism and overconfidence. For example, Hackbarth (2008, 2009) indicates that optimism is the term used to refer to people who normally give wrong answers in growth perception and risk perception, overestimate the growth rate of return and growth rate of assets in the firm, and underestimate the riskiness of return and growth rate of assets. Heaton (2002) defines an optimistic manager in his research as a person who overestimates systematically the probability of good firm performance while underestimating the bad one. Also in the management field, Baker and Wurgler (2012) state that optimistic managers tend to be confident and believe in a very positive value of assets and results of investment opportunities. With a more severe consideration, Landier and Thesmar (2009) point out that optimistic people have no realistic beliefs in types of projects.

In general, we can follow the research of Moore and Healy (2008) to examine the explanation of overconfidence. Accordingly, the study summarizes all relevant articles of overconfidence and finds out that 64% of empirical papers indicate that overconfidence refers to people who normally overstate their abilities, performance, level of control and outcomes, and 31% results from previous studies show that overconfidence is "the excessive certainty regarding the accuracy of one's belief", Finally, only approximately 5% conclusions indicate that overconfidence is described through the better-than-average effect.

3.2.1.2. The effect of managerial overconfidence on corporate financial behaviours

In order to set up the hypothesis for the relationship between managerial overconfidence and debt maturity, it is necessary to understand the impact of managerial overconfidence on corporate financial behaviours. Following that, we find out the base to predict the effect of managerial overconfidence on debt maturity. This section, therefore, is going to review, examine and discuss a wide range of relevant literature related to the relationship between overconfident managers and corporate financial decisions.

When conducting a study to investigate the impact of overconfident CEOs on the results of investment projects, March and Shapira (1987) and Langer (1975) indicate that there is a negative effect between managerial overconfidence and the success of the projects. The investment projects seem to receive worse results than expected due to an underestimation from an overconfident CEO. Malmendier and Tate (2005) also confirm that managerial overconfidence tends to over-predict the profitability of investment projects and the future returns of projects. With a similar study in terms of examining the impact of managerial

overconfidence on investment projects, Heaton (2002) conducted surveys to identify optimistic managers and concluded that overconfident managers might cause a reduction in the positive NPV of projects. Furthermore, Heaton (2002) also stresses that optimistic managers might normally face an increase in the cost of external financing from high-risk projects and create an increase in the sensitivity of projects' free cash flow due to the fact that they overestimate their investment projects and overvalue the investment opportunities. Huang et al. (2011) also believe that firms with high state ownership and overconfident managers usually tend to raise the sensitivity of investment projects' returns.

In terms of corporate decisions, overconfident CEOs see external financing sources as an undue cost (Malmendier and Tate, 2005) and tend to use more internal financing sources than debt and more debt than equity (Malmendier et al., 2007 and Lin et al., 2008). In 2011, Malmendier et al. published a paper and also confirmed again a point in the decision-making process of overconfident managers, namely that overconfident managers tend to use less equity and external sources of financing compared to their non-overconfident peers. Besides that, overconfident managers are believed to prefer to use a tight dividend policy (Deshmukh et al., 2013). Accordingly, Deshmukh et al. (2013) point out that optimistic managers consider external financing sources as costly and attempt to retain more earnings for future investments. The preference for using an aggressive capital policy is also considered to be used more in firms with aggressive managers (Huang et al., 2016). This means that more short-term capital is used in the capital structure of firms with more optimistic managers. Recently, Adam et al. (2015) confirmed that more failures in corporate decisions have a significant association with overconfident managers and firms with more of those kinds of managers normally face more risks.

Regarding the impact of optimism on firm predictions, Hribar and Yang (2016) conclude that overconfident managers tend to have more wrong predictions than their non-overconfident peers and thus might lead to a loss of control for investment outcomes. These scholars also stress that overconfident managers usually have a narrower range of predictions.

In other aspects, overconfident managers are believed to invest more in innovative industries and gain more benefits from those investments, but also face more volatility in return (Hirshleifer et al., 2012). One judgment from Campbell et al. (2011) stated that managerial overconfidence makes firms experience more forced turnover. Shu et al. (2013)

indicate that optimistic managers tend to be confident about their firms' stock value and always think they are undervalued, hence making more share repurchase transactions. By using gender to determine overconfident managers, Huang and Kisgen (2013) illustrate that there is a certain difference in the operating results between male and female managers. Accordingly, male managers are believed to be more overconfident than female managers. In their study, they point out that male managers tend to have more acquisitions and issue more debt than female managers. Generally, from a number of previous studies that have been mentioned above, there is a certain basis to believe that managerial overconfidence has a significant impact on corporate decision-making that can make operating results become more different compared to firms with non-overconfident managers.

In terms of debt maturity, through an indirect analysis, with the problem of information asymmetry, overconfident managers with more private information are believed to prefer short-term debt over long-term debt to signal the market in the study of Flannery (1986). Similarly, short-term debt is described as a preferred fund by overconfident managers, because overconfident managers might believe that equity is more mispriced than debt, and hence prefer issuing debt to equity, especially short-term debt (Minggui et al., 2006, Malmendier et al., 2011). The explanation about the preference for issuing short-term debt instead of long-term debt by overconfident managers is explained in great detail in the study of Landier and Thesmar (2009). Accordingly, Landier and Thesmar (2009) state that for investors in the credit market, it is not easy to recognize overconfident managers. Therefore, the optimal financial contract should induce a separated equilibrium and then lead to a trend that overconfident managers prefer issuing short-term debt, while non-overconfident counterparts might prefer issuing long-term debt instead. In more detail, it is explained that optimistic managers are different from rational managers, whereby rational managers believe that short-term debt is too risky, while optimistic managers believe more about the benefits of using short-term debt. Further, optimistic managers also tend to overestimate the successful result of investment projects and underestimate the possibility of default risks. Hence, short-term debt can be a better choice for overconfident managers, because it helps to enhance the allocation of cash flows. In addition, if there is any risk to investment projects, short-term debt is better for any adjustment.

All conclusions above strongly suggest support for the hypotheses of this study. Following that, firms with managerial overconfidence are believed to use more short-term debt than

long-term debt. The preference of short-term debt by overconfident managers might stem from the benefits of short-term debt, such as lower cost of using capital and ease of access. Aggressive managers are also predicted as having a higher deviation between the optimal debt maturity and the actual debt maturity. Therefore, we set up the following hypotheses for this study and attempt to find solutions to these hypotheses. The hypotheses are as follows:

Research hypotheses

H3.1: Firms with overconfident managers hold less long-term debt

H3.2: Overconfident managers lead to a higher deviation in the level of target debt maturity

3.2.1.3. Overconfidence measurement from previous studies

After investigating the impact of managerial overconfidence on corporate decisions, this section moves on to examine the measurements of managerial overconfidence and then to determine the best measurements for the study.

Throughout a number of previous studies, it is seen that the most popular method used to measure overconfidence is the use of options (Lambert et al., 1991, Meulbroek, 2001, Hall and Murphy, 2000, 2002, Lin et al., 2005, Malmendier and Tate, 2005, Hirshleifer et al., 2012, Ahmed and Duellman, 2012, Shu et al., 2013, Ting et al., 2014, Hsieh et al., 2014, Malmendier and Tate, 2015, and Hribar and Yang, 2016). Accordingly, the basis of using options might stem from the study of Lambert et al. (1991), Meulbroek (2001), and Hall and Murphy (2000). In these studies, risk-averse is used to indicate CEOs who normally do not hold options for a long time but sell them earlier than non-risk averse CEOs. The scholars explain that risk-averse CEOs do not want to hold options in the long term because it reduces their diversification portfolio, hence they exercise options when they believe options are high enough in value. To strengthen the use of options to measure overconfidence, Malmendier and Tate (2005, 2008) show that options and stock are a kind of compensation for managers, thus those securities might not be traded as short selling to reduce their risks. In the case of managers want to exercise them quickly, this means they do not believe in the future of those securities and also lack confidence in their firms. In 2015, Malmendier and Tate once more published research related to the impact of managerial overconfidence on corporate management. In this research, the two scholars also use options to measure overconfidence and clearly explain that options are a kind of

untradeable stock and usually take a long time, i.e. many years, to get a return. Therefore, they believe that overconfident managers do not care about the duration of getting a return from options, because they believe in themselves and in the success of their firms to get a much higher return from options when they hold them for a long time. To avoid the subjective in overconfidence measurement, many researchers use different ways to measure this term besides the use of options, including Malmendier and Tate (2005, 2008, 2015) and many other scholars such as Hirshleifer et al. (2012), Shu et al. (2013), Ahmed and Duellman (2012), Ting et al. (2014), and Hribar and Yang (2016). For example, in the research of Hirshleifer et al. (2012), they use two measurements of overconfidence, namely options and the press-based measure, which are mainly developed from the studies of Malmendier and Tate (2005, 2008) and have the same explanations. In terms of the press-based measurement, Hirshleifer et al. (2012) focus on some keywords, including confident, confidence, optimistic, optimism, or over-optimism, over-optimistic and pessimistic, pessimism, reliable, and steady, that are found from reputation articles relating to CEOs for each CEO and each year to identify overconfident CEOs. Having the same use of the two proxies of options and the press-based, Shu et al. (2013) and Hribar and Yang (2016) also confirm that these are appropriate to measure overconfidence; however, the keywords mainly focus on the two terms of over-optimism and miscalibration. Quite similarly, by using media coverage and based on best quality press in Australia, Brown and Sarma (2007) identify optimistic managers by collecting five factors, namely openness, conscientiousness, extroversion, agreeableness, agreeableness, and neuroticism, based on the Five Factor Model (Goldberg, 1999, McCrae and John, 1992, and Costa and McCrae, 1992). Moreover, besides basing on both options holdings and media coverage, Ting et al. (2014) expanded the research by using one more overconfidence measurement, namely the bias in earnings forecasts. Actually, the use of bias in earnings forecasts is often mentioned in many previous papers, such as the studies of Huang and Kisgen (2013), Huang et al. (2011), Hilary and Hsu (2011), Lin et al. (2005, 2008), and Huang et al. (2011). For example, Lin et al. (2005) used the results of upwardly biased forecasts and downwardly biased forecasts in firms to measure managerial overconfidence. Following Lin et al. (2005), overconfident managers tend to have more upwardly biased predictions than downwardly biased predictions during the management term and they call overconfident managers long-holders. In the research of Huang et al. (2011), which was developed from

the study of Lin et al. (2005), the bias in forecasted earnings and actual earnings is examined to identify managerial overconfidence, whereby overconfident managers are believed to over-forecast more often than non-overconfident managers. Besides the use of the bias in earnings forecast, Huang et al. (2011) also employ a different proxy of overconfidence, namely the executive's relative salary. This second proxy was developed from the research of Hayward and Hambrick (1997); accordingly, those researchers indicate that high management positions have a close relationship with a high executive's relative salary. High relative salary means that the managers are more powerful and this might lead to the illusion of control, which is a form of overconfidence (Sivanathan and Galinsky, 2007, and Rudski, 2004).

By using four proxies of managerial overconfidence measurement, Ahmed and Duellman (2012) also agree with Malmendier and Tate (2005, 2008) and see options as one of the best appropriate measurements of overconfidence. Besides that, they use the net purchases of executives, investment-based proxy, in which they believe overconfident CEOs tend to have larger capital expenditure, and a proxy based on the excess investment in assets from the residual of regression of total asset growth on sales growths run by industry-year to identify optimistic CEOs.

Doukas and Petmezas (2007) have a different point of view from Malmendier and Tate (2005) whereby they believe that a long hold of options might not reflect overconfidence, as it might be due to them being "in the money" of the options. Following that, they introduce a different measurement of overconfidence that stems from the study of Goel and Thakor (2002), in which they believe that overconfident managers tend to promote the opportunities of success in contests, and from that identify optimistic managers.

Another method used to measure overconfidence is through the use of a number of psychometric questions (Scheier et al., 1994, Graham et al., 2013). For instance, to measure the overconfidence level of participants, Scheier et al. (1994) used psychometric questions in their survey, Similarly, Graham et al. (2013) also conducted a survey and used questions related to aversion to risk, time preference, aversion to sure losses and optimistism to identify overconfident people.

Interestingly, the visibility of the CEO's photograph in the firm's annual reports is considered as one of the measurements for overconfidence. In particular, Schrand and Zechman (2012) believe that the bigger the size of the CEOs' photographs appearing in

annual reports, the greater the overconfidence level of CEOs. With a new viewpoint, Yang and Zhu (2016), Mishra and Metilda (2015), Huang and Kisgen (2013) suggest that there is a difference in the overconfidence level between male managers and female managers. They believe that male managers are considered as being more confident than female managers, thus they use the gender of CEOs as a good measurement for managerial overconfidence. However, there is also a different opinion against the conclusion of Yang and Zhu (2016), Mishra and Metilda (2015), Huang and Kisgen (2013), as male and female managers are illustrated as being no different in terms of overconfidence level in the research of Hardies et al. (2009). However, the number of scholars believing in the different levels of overconfidence in males and females is more than the number of opposers. Therefore, it is acceptable to think the gender of CEOs is an appropriate measurement of overconfidence.

One last measurement shown in a number of previous studies is also considered as one of the best ways to measure overconfidence, that is the analysis of vocal pitch or tone of voice. In fact, a number of papers have found a close relationship between tone of voice and human behaviours (Gamer et al., 2006, Feldman et al., 2009, Elkins and Burgoon, 2010, Hobson et al., 2011, Davis et al., 2012, Mayew and Venkatachalam, 2012). For example, in a psychology study by Gamer et al. (2006), vocal pitch is indicated as a good tool to detect guilty and innocent people. Moreover, Elkins et al. (2012) demonstrate that the carrying of alerting or emotional messages can be recognized by the human voice. In the management and finance field, Feldman et al. (2009) point out that the change of managers' tone might help to predict the drift return and also notice the strength of the company's information environment. Hobson et al. (2012) analyse the relationship between financial misreporting and the vocal dissonance and find that there is a positive impact of the vocal dissonance on the financial misreporting. Additionally, managerial styles can also be determined by investigating the managers' tone of voice in conference calls. Accordingly, Davis et al. (2012) indicate that managers' tone in conference calls has a significant impact on managerial manners. Lastly, the power of voice is believed to have a significant relationship with the future earnings prediction of firms (Mayew and Venkatachalam, 2012). Generally, the tone of voice can be seen as an important factor in analysing the role of managers' behaviours in corporate management. Importantly, Dabbs and Mallinger (1999) indicate that there is a significant relationship between the low voice pitch of men

and high testosterone levels. Accordingly, high testosterone levels imply a low voice pitch (Dabbs and Mallinger, 1999), and this is considered as leading to taking more risky decisions (Apicella et al., 2008, Sapienza et al., 2009, and Stenstrom et al., 2011). Furthermore, the behaviours of taking more aggressive and risky decisions are normally referring to managerial overconfidence (Menkhoff et al., 2006). Therefore, it is believed that through analysing the managers' voice pitch, we can measure the overconfidence levels of managers and find out its impact on corporate behaviours.

To sum up the measurements of overconfidence, it can be seen that there are a number of methods used to measure this term, such as analysing the holding of options, press-based measure, media coverage, bias in earnings forecasts, executives' relative salary, investment-based proxy, psychometric testing, the size of CEOs' photographs appearing in firms' annual reports, gender of managers, and tone of voice.

3.2.2. The determinants of debt maturity

3.2.2.1. The theory of debt maturity

3.2.2.1.1. The agency cost theory

The agency cost of debt is considered to affect the choices of debt maturity. According to Myers (1977), short-term debt maturity, lower financial leverage and more restrictive covenants to debts can be seen as a good way to minimize the underinvestment problems that stem from the different interests between debt-holders and equity-holders. In fact, short-term debt-holders normally find it easy to rewrite the debt contracts before agency costs create any changes to the value of the underlying assets. According to the study of Barnea et al. (1980), prices of short-term debt are stated to be insensitive to a shift in the risk of underlying assets; therefore, short-term debt might mitigate the incentive for risky asset substitution. Moreover, Barclay and Smith (1995) state that firms in a period of high growth that are normally facing the agency problem are predicted to use more short-term debt. On the other hand, following liquidity risk theory, firms might prefer to use long-term debt during a period of risky growth opportunities to prevent the risk from inefficient liquidation.

3.2.2.1.2. The matching principle

According to the maturity matching principle, Stohs and Maurer (1996) and Morris (1976) indicate that firms might have a high risk of not reserving sufficient cash when the maturity of debt is shorter or longer than the maturity of assets. Along with agency cost theory,

Myers (1977) also explains the matching principle for the firm's debt maturity. Accordingly, the most common trend is the matching between debt maturity and the maturity of assets. That means that a new project comes at the same time as the new necessary debt is issued and the old debt maturity expires, and firms with more long-term assets should finance using long-term debt. Myers (1977) also stresses that when the maturity of debt matches the maturity of an asset, it can help to minimize the problem of underinvestment. The matching principle also indicates that the transaction cost can be reduced by refinancing the cost of short-term debt. On the other hand, Kolb (1987) shows that the matching principle can be risky for firms because short-term debt might not have net working capital. Gapenski (1999) classifies the matching principle following two aspects of corporate management, namely the accounting approach and the financing approach. According to Gapenski (1999), in terms of accounting approach, current assets should be financed by short-term debts, while for property, plants and equipment they should be financed by long-term debts and equity. Regarding the financing approach, assets are classified as permanent and temporary. Accordingly, long-term debts and equity should be used for permanent and fluctuating assets, while short-term debts should be employed for temporary assets. According to the financing approach, it seems that long-term debts are preferred to be used in capital structure since it is more stable in the interest costs but also more costly (Gapenski, 1999).

3.2.2.1.3. Signalling theory

The signalling theory of Flannery (1986) states that short-term debt can help firms to mitigate the impact of information asymmetries between inside investors and outside investors on financing costs. Meanwhile, the long-term debt can be wrongly estimated with the existence of information asymmetries. Furthermore, in terms of refinancing risk, firms with a high reputation and good quality are more likely to easily access short-term debt (Flannery, 1986, Kale and Noe, 1990). By contrast, for low-quality firms, it is more difficult to access the financial market, hence long-term debt can be a better choice when they have chances of financing funds. Also, Lucas and McDonald (1990) argue that companies that have benefited from equal investors tend to issue longer and more mispriced debt after an excellent time of operation. Hence, the expectation from the relationship between debt maturity and firm performance is negative and that with firm's quality is positive. However, according to Diamond (1993), under the effect of asymmetric

information and liquidity cost, there is a complicated relationship between debt maturity and the company's credit risk. That means that good and bad quality companies tend to use more short-term debt, while moderate firms are more likely to pick up a kind of moderation of debt maturity. Therefore, the expectation of the relationship between debt maturity and firm quality (can be measured as Altman's Z-score) is non-linear.

3.2.2.1.4. Tax theory and interest rate theory

According to Kane et al. (1985), the decision on the optimal level of debt maturity might be based on the trade-off between the benefits from the corporate tax shield and the shortcomings from the risk of bankruptcy and flotation costs. Kane et al. (1985) also indicate that the major factors determining the optimal level of debt maturity are taxes, bankruptcy costs and flotation costs. In another study, Brick and Ravid (1985) contend that using long-term debt can help to enhance the firm's value during a time of an upward sloping of the interest rate. Also, a high long-term interest rate means that the firm can get the benefit from the tax shield during this period. Furthermore, Brick and Ravid (1985) also show that long-term debt has more advantages when the interest rates are volatile and the firm looks to a stream of taxable earnings. In considering the interest rate risk, Morris (1976) suggests that short-term debt can be used to reduce the asset risk when the interest rate has the same movement with revenues or the value of the asset. That means that firms might prefer long-term debt if there is a negative relationship between assets and interest rates and vice versa.

3.2.2.2. The determinants of debt maturity – empirical work

Sharpe (1991) shows that there are two stages of financing for investment. In the early period, a firm might use short-term debt to have concessionary lending, but he also indicates the higher risk from this source compared to long-term financing for a long period in terms of assets demand. However, the use of long-term debt might also lead to a higher risk premium for the investor and hence increase the financing cost.

Mitchell (1993) investigates the role of interest rates for debt maturity and concludes that the increase in the volatility of future nominal interest rates will have a negative effect on the debt maturity. This trend is explained by the fact that most managers want to avoid the high cost in the future from long-term debt. The same conclusion regarding interest rate comes from the study of Kim et al. (1995). Accordingly, debt maturity is considered to increase when the volatility of the interest rate and the slope of the term structure rise.

These findings also support the interest rate volatility prediction model.

Stohs and Mauer (1996) conducted a study investigating the determinants of corporate debt maturity through a maturity structure measurement. The paper proves that less risky companies with longer-term asset maturities tend to prefer longer-term debt. Furthermore, the structure of debt maturity is negative with earnings surprises and the effective rate of the company. Interestingly, the two scholars find that companies with high or very low bond ratings normally use shorter-term debt maturity.

A study of Demirguc-Kunt and Maksimovic (1999) conducted across 30 countries to examine the debt maturity structure in these countries demonstrates that larger firms have more long-term debt than others. However, for countries with a big banking sector, the decision seems to be different in that higher short-term debts will be used more widely. Regarding the role of government, these two authors find that there is a positive relationship between government subsidiaries to industry and long-term debt maturity. Further, the activity of the stock market has no effect on the debt maturity decision, also is proved in the research. Differently, Deesomsak (2009) proves that the debt maturity structure will be strongly affected by the economic environment. This conclusion is also consistent with the findings of Cai et al. (2008), which indicate that the debt market and equity market conditions have a significant effect on the firm's debt maturity. Additionally, the research examines the association of ownership structure with the debt maturity and concludes that there is some influence from ownership on debt maturity. The findings of this paper also show that greater firm size, asset maturity and liquidity might lead to larger debt maturity. Growth opportunities are one of the elements that several scholars mention when examining the determinants of corporate debt policy. Goyal et al. (2002) conclude that in the defence industry, when growth opportunities decrease, the maturity of debt will increase.

Ozkan (2002) conducted research throughout UK firms to determine what elements affect the corporate debt maturity and indicated that firm size and asset maturity have a positive impact on the debt maturity, while agency-related costs and the volatility of firm value are represented as having a negative relationship with debt maturity. Furthermore, in terms of the tax effect, the paper finds no evidence to support the relationship between a tax effect and corporate debt maturity.

There is interesting research from Schmukler and Vesperoni (2006), who examined the

effect of financial globalization on the debt maturity in emerging markets. The paper demonstrates that along with globalization and the entry into the international environment, firms tend to raise and extend their long-term debt. However, financial liberalization leads to a contradicting trend. In a quite similar study, Guerrero (2007), with a topic related to early-stage financial globalization, also proves that the development of financial liberalization leads to the shorter use of debt maturity.

By conducting research in France, Germany and the UK, the paper of Antoniou et al. (2006) reveals that the corporate debt maturity structure would be affected by the financial and legal traditions from each country where they are doing business. When doing research from 4500 Ukrainian firms – an emerging market –Stephan et al. (2011) find that constrained and unconstrained firms make different decisions regarding debt maturity structure.

By using variables such as leverage, asset maturity, firm size, growth opportunities, profitability, business risk, dividend yield, liquidity, tangibility, and tax rate, Terra (2011) indicates that there is a substantial dynamic factor in determining the debt maturity and that firms face moderate adjustment costs towards the optimal maturity. This conclusion also is supported in the study of Kirch and Terra (2012). However, the paper of Kirch and Terra (2012) showed a new finding in that the quality of national institutions is an essential determinant of debt maturity. López-Gracia and Mestre-Barberá (2011) studied the association between tax effect and debt maturity structure and found that the tax effect has a strong influence on the maturity of the debt. Additionally, debt ratio, firm size, growth opportunities and asset maturity also play an important role in determining the debt maturity structure. With the same conclusion, An (2014) conducted research in China through a quasi-experiment and found that for foreign investment enterprises, taxation plays a very important role in debt structure decision-making and the shorter debt maturity is preferable for these companies. These conclusions in terms of taxes contradict the finding on the previous papers of Arslan and Karan (2006) and Ozkan (2002) that is there is no effect between taxes and the maturity of the debt.

A paper of Custódio et al. (2013) reveals a recent trend among US firms in that there has been a decrease in the use of long-term debt during the last three decades. This trend is described especially for firm with higher information asymmetry and new firms offering IPOs to the public.

Costa et al. (2014) discovered findings that are consistent with liquidity theory in which smaller companies that are normally affected by asymmetric information will prefer short-term debt. The same movement happens with high-quality firms but is contrasting for intermediate firms. In another aspect, Belkhir et al. (2016) investigated the effect of labour protection on the debt maturity. Their research was conducted in 43 countries with 114,594 firm-year observations and they found that firms in which labourers have high protection commonly use more short-term debt.

In terms of ownership structure, Datta et al. (2005) find that managerial stock ownership plays a very important role in deciding the debt maturity structure through two factors – credit quality and growth opportunities. Having a quite similar study area when examining the effect of managerial ownership on debt maturity, Guney and Ozkan (2005) indicate that managerial ownership has a negative relationship with debt maturity. Arslan and Karan (2006) show that even though there is a moderate relationship between ownership concentration and debt maturity, the firm with more growth opportunities tends to have more short-term debt to address the underinvestment problems, even for firms with high ownership concentration. Furthermore, the authors state that firm size is positively related to debt maturity. Recently, Ben-Nasr et al. (2015) also examined the effect of ownership structure on debt maturity and showed that the controlling owners tend to use long-term debt rather than short-term debt in the debt structure to minimize the controlling by lenders. Accordingly, firms with multiple larger stockholders normally have shorter debt. With the same idea for investigating the role of ownership in debt maturity decisions, Díaz-Díaz et al. (2016) examine the effect of family control on the debt structure. This research finds that family companies find it easier to access long-term debt, but there is a negative trend on debt maturity for family firms in the second position of the pyramid. Through 444 listed companies from the Middle East and North Africa region, Awartani et al. (2015) discover that there is a limited number of firms using more long-term debt in this region. The findings also indicate that leverage, firm size, and asset tangibility have a positive relationship with long-term debt maturity. In contrast, companies with a higher default risk normally use more short-term debt maturity. Additionally, under the strong support of the law, regulation or creditor legal protection, and the efficiency of financial intermediaries, firms prefer long-term debt to short-term debt. Ovtchinnikov (2015) also comes the same conclusion in terms of regulation and, according to this scholar, firms in deregulated

industries tend to use more short-term debt. One new point from the study of the Dang and Phan (2016) is that they examine the relationship between CEO inside debt and the debt maturity. The paper indicates that CEO inside debt helps to decrease the cost of debt financing, which means the firms with more CEO inside debt tend to have short-term debt maturity.

3.3. The security market and the banking system in Vietnam

The main purpose of this study is to determine the relationship between managerial overconfidence and the decision of debt maturity. Therefore, this section attempts to investigate the security market including the bond and stock markets and bank market in Vietnam. In fact, the structure and capitalization of each market type might have a strong impact on the manager's decisions besides personal characteristics. The following information about the securities market in Vietnam can be supportive information for the empirical regression results of the research.

Firstly, a brief overview of Vietnam's securities market is mentioned. In 2000, the first stock exchange market in Vietnam was established in Ho Chi Minh City with only two listed companies. After that in 2005, the second stock exchange market was founded in Hanoi, marking an incredible change in the stock market in Vietnam. After 15 years of growth and development, the security of Vietnam has changed significantly, whereby the total capitalization of the stock market is 1.36 quadrillion VND, equivalent to 1,300 times compared to 2000 and equal to 34.5% of GDP 2015. The total outstanding volume of the bond market reached 24.13% of GDP. Hence, the total capitalization of the whole capital market reached 59% of GDP in 2015 (SSC Vietnam, 2016).

In terms of the bond market in Vietnam, even though it accounts for about 24.13% of GDP in 2015, it was mostly created by government bonds, while corporate bonds only account for about 13%-15% in total (Huong and Thuy, 2016). This is shown more in the following figure.
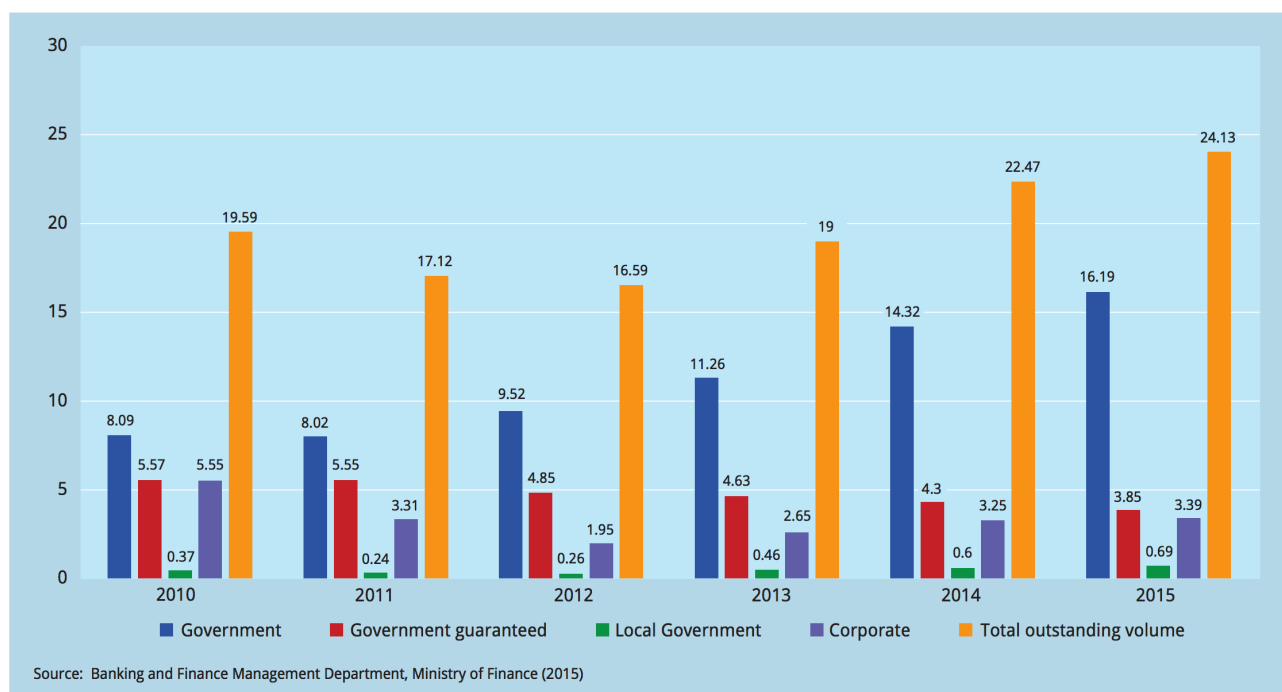
Figure 3.1: Bond market size of Vietnam (2010-2015, %GDP)

It is seen that there has been significant fluctuation in the bond market over the last 5 years; however, it also reveals a steady increase on government bonds, while corporate bonds have experienced a slight decrease during the last 5 years. It seems that there have been some drawbacks for firms to access the bond market in this country. Furthermore, the bond market in Vietnam is recognized to mostly focus on short-term maturities (Huong and Thuy, 2016), which can be seen as a big disadvantage in this country's bond market.

It can be stated that the corporate bond market in Vietnam is still nascent and less liquid. The majority of the issuances take place at private points. Furthermore, local commercial banks still play a very important role and are major debt sources for corporate borrowings VCBS (2019). In general, in Vietnam, it is easier for a firm to access capital from the capital market and bank debt than the bond market. Therefore, based on these conditions, we can believe that this might strongly affect the decisions of managers in capital structure determination.

3.4. Methodology

3.4.1. Research design

3.4.1.1. Measurement of managerial overconfidence for this study

From a review of the literature related to overconfidence measurements, it can be seen that

there are a number of different methods used to measure overconfidence, such as analysing the holding of options (Lambert et al., 1991, Meulbroek, 2001, Hall and Murphy, 2000, 2002, Lin et al., 2005, Malmendier and Tate, 2005, Hirshleifer et al., 2012, Ahmed and Duellman, 2012, Shu et al., 2013, Ting et al., 2014, Hsieh et al., 2014, Malmendier and Tate, 2015, and Hribar and Yang, 2016), press-based measure (Malmendier and Tate, 2005, 2008, Hirshleifer et al., 2012, Shu et al., 2013, and Hribar and Yang, 2016), media coverage (Brown and Sarma, 2007, Ting et al., 2014), the bias in earnings forecasts (of Huang and Kisgen, 2013, Jiang et al., 2011, Hilary and Hsu, 2011, Lin et al., 2005, 2008, and Huang et al., 2011), the executive's relative salary (Hayward and Hambrick, 1997, Huang et al., 2011), the net purchases of executives, investment-based proxy, and the excess investment in assets (Ahmed and Duellman, 2012), psychometric testing (Scheier et al., 1994, Graham et al., 2013), the visibility of the CEO's photograph in annual reports (Schrand and Zechman, 2012), gender of CEOs (Yang and Zhu (2016), Mishra and Metilda (2015), Huang and Kisgen, 2013), and the analysis of the manager's voice pitch (Gamer et al., 2006, Feldman et al., 2009, Elkins and Burgoon, 2010, Hobson et al., 2011, Davis et al., 2012, Mayew and Venkatachalam, 2012). Applied to the Vietnamese market, we find that options are not suitable as the use of options in Vietnam is still very new and not popular in Vietnam at the time of the research; therefore, it is impossible to use options to measure overconfidence for this research. For press-based measure and media coverage, there are not many particular newspapers relevant to business or management, or that mention CEOs in detail, so it is also very hard to apply this measurement. In terms of the bias in earnings forecasts and psychometric test, we attempted to use them for this study, but they seemed to be not significant so we ignored these measurements. For the net purchases of executives, investment-based proxy, and the excess investment in assets, those kinds of data are not available in database or other Vietnam's source; therefore, they also cannot be used. Regarding the gender of CEOs, as this paper aims to examine the gender of managers as an explanatory variable for debt maturity, we do not bring it to be one of the measurements of overconfidence. Finally, we decide to use three proxies, namely the analysis of voice pitch and the visibility of the CEO's photograph appearing in the firm's annual reports, and more importantly, we construct a comprehensive from these two measurements to have a further check of the regression results from these two prior overconfidence measures.

In terms of the first proxy of overconfidence measurement – voice pitch analysis – there

have been no papers directly analysing voice pitch as a measurement of overconfidence. Most have just analysed the tone of voice, the language used, and the vocal tone in different ways. As analysed in the section of overconfidence measurement, based on some papers of Dabbs and Mallinger (1999), Sapienza et al. (2009), Stenstrom et al. (2011), Apicella et al. (2008) and Menkhoff et al. (2006), we believe that voice pitch can be a very good measure of overconfidence. The use of voice pitch to measure overconfidence actually makes this study becomes a special and unique study.

The analysis of voice pitch is carried out as follows. After recording all interviews, the files are transferred into the software named "Recorder Plus" to remove the voice of interviewer from the voice of interviewees. After that, all refined files are transferred into the Praat software to identify the voice pitch of managers. The suggestion to use Praat to analyse voice pitch stems from the study of Mayew et al. (2013). The voice pitch ranges from 0 to 300 F_0 in Hz (F_0 in Hz - the measurement of voice pitch). After identifying all the voice pitches of managers, it is recognized that the majority of male managers tend to have low voice pitch compared female managers, although there are also few male managers who have high voice pitch and vice versa. The logic is the higher the voice pitch, the lower the testosterone level and this is considered as less confident level than a lower voice pitch, we confirm that a low level of voice pitch predicts more overconfident managers. Therefore, to make the statement becomes more convenient and to avoid confusion, we adjust the voice pitch to make it easier for interpretation. Accordingly, 100 is divided by the original voice pitch to obtain the "voice pitch adjustment". The statement now becomes that the higher level of voice pitch adjustment, the greater the level of managerial overconfidence. The voice pitch adjustment is calculated as follows.

Voice pitch adjustment = 100/ Voice Pitch

The questions used to ask managers are constructed as open-ended questions that mean encouraging participants to answer as much as possible. The long answers help to analyse the voice pitch more easily. The questions asked are relevant to some aspects of corporate management in which there is a question related to debt maturity. The participants are not required to answer all questions; if they think any question is not appropriate for them, they have the right to refuse to give the answer. All of the questions are as follows.

> ***Question 1***: What are your benchmark decisions relating to cash holdings and debt maturity?

Question 2: Do you believe cash holdings will impact on firm performance? If yes, explain why.

Question 3: Do you believe debt maturity has an effect on firm performance? If yes, explain why.

Question 4: Do you evaluate your company/compare your company to your competitors? Who are your company's competitors?

Question 5: What is your opinion about acquisition? What do you think about any acquisition in the future of your company?

How many acquisitions have there been in your company since you were CEO?

Question 6: What do you think about the future economy of Vietnam, for example in the next 10 years?

Question 7: What do you think of the investment opportunities in your company's industry?

To avoid the bias in selecting only one measurement, the study also uses CEO's photographs appearing in the firm's 2016 annual reports to measure overconfidence. Accordingly, following the study of Schrand and Zechman (2012), the visibility of the CEOs' photographs is given points from 1 to 4. It is believed that the larger the size of the CEOs' photographs appearing on the annual report's page, the higher the level of overconfidence. Therefore, the meaning of points is as follows: 4 if the CEO's photograph appears on the whole page or at least a half of a page, 3 if the CEO's photograph represents less than a half of a page but more than a quarter of a page, 2 if the photograph is less than a quarter of a page, and 1 if there is no photograph. Following that, the greater the number of points, the greater the overconfidence level of the CEO.

Lastly, to have a further support for the regression results from the two prior overconfidence measurements, we construct a comprehensive index combining exactly from the voice pitch and the CEO's photographs appearing in the firm's 2016 annual reports; and we call the comprehensive index is the third overconfidence proxy. The third overconfidence proxy is constructed as follows. For the first proxy of overconfidence, we find the median value throughout the all sample firms; after that, we denoted the value of 1 for the sample value that is higher than the median value and stating it represents for overconfident manager, and the value of 0 if the sample value is lower than the median value and stating it refers to non-overconfident managers. For the second proxy, we believe that managers who keep the at least half-sized of the photos on a page is overconfident and otherwise is non-overconfident. Hence, we denoted 1 for managers with point of 4 and otherwise is 0. Finally, we add these two proxies together and find the sum of them.

Meaning that, the third proxy of overconfidence represents the higher of the total points, the higher level of overconfidence.

3.4.1.2. Sample selection, data sources and data collection

In terms of sample selection, the Vietnamese market is the target market of the study. In fact, there has been a wide range of studies doing research in many different countries, especially in developed nations, where almost all kinds of data are available and easy to access. In Vietnam, if we search for studies conducted in this country from the literature sources, it becomes clear that there are just a few papers. One issue that makes studies harder when doing research in Vietnam is the difficulty in accessing data sources. Many kinds of Vietnamese data are missing from global data sources. In conducting this research, we believe that the study might be unique in doing research in the field of managerial overconfidence and debt maturity in Vietnam in particular and across the world in general. The concentration in the Vietnamese market might mean that the research is different compared to other studies that mostly focus on developed markets. The research sample of this study comprises two different sample sizes. One is collected from interviews, and the second is extended from all 648 Vietnam non-finance listed firms. We have the data collection results in the following.

The first purpose of the study was attempting to collect managers' voice pitch to measure overconfidence levels. Thus, it is necessary to have a clear voice of managers, and for this reason, we targeted conducting direct interviews with top-line managers of listed Vietnamese firms. We hope to have as many interviews as possible; however, having a meeting with top-line managers of the biggest companies is not an easy mission. In fact, there were only 648 non-financial listed firms on the Vietnamese stock market until the end of 2016 – the year this research was conducted. Finally, we collected 123 direct interviews with top-line managers, and we believe that this number is reasonable as it accounts for 18.98% of the population. For the interviews, the open-ended questions are designed to collect managers' voice pitch in long answers that are long enough to analyse the voice pitch. Besides, all questions are relevant to debt maturity and other corporate aspects and we hope the answers can further support the research results.

The sub-sample size is 123 non-finance listed firms on the Vietnam stock exchange market, which was collected randomly from the whole population of non-finance listed firms. The most important data type in the sub-sample size is the interviews of 123 top managers of

Vietnamese non-finance listed firms. In particular, emails and phone calls were sent, asking for participants in the research, whereby 424 listed companies were contacted. However, there were only 123 responses and 5 companies refused to allow the recording of the interviews, which equals an 18.98% sampling of the population of 648 non-finance listed companies. Specifically, there are 19 CEOs, whereby 4 are CEOs and also chairmen, 73 CAOs, of which 3 are CAOs and also vice executive director, 8 CFOs, and 23 vice executive directors. In the 72 companies with 72 CAOs, these companies do not have chief financial officers; hence, CAOs can be seen as playing a role similar to CFOs. The interviews were conducted over two periods; one was from February to May 2017 with 79 interviews were conducted and the other was from October 2017 to February 2018 with the rest of 44 interviews were conducted. Most of the interviews were conducted at the working place of the managers, while some were conducted at the annual conference for listed companies at the Hanoi Stock Exchange market organized at the beginning of October 2017, and a small number were held in other places such as homes and cafés.

Secondly, it can be seen that for the other measurement of overconfidence, namely the visibility of CEOs' photographs, that the data can be collected for the full population. That means that all CEOs' photos can be found from firms' annual reports. As the year of conducting the research was 2016, we also chose firms' 2016 annual reports to analyse the size of CEOs' photos. The reasons for choosing the CEO's photograph is that it can help to avoid a bias in research results that would occur if we were to only base on one variable measurement. Furthermore, the interviews were conducted with top-line managers, while the photographs are of CEOs; therefore, it is also a very good diversification of the research subject and also helps to avoid bias in the research. In fact, there are a total of 648 non-financial listed firms on the Vietnamese market; therefore, photo data of 648 CEOs was collected from annual reports. Each annual report is considered carefully to classify the appropriate level of managerial overconfidence.

For the extended sample size, and other data needed for the sub-sample size, all necessary data were primarily collected from Thomson Reuter EIKON and hand-collected from annual reports of companies.

3.4.1.3. Proxies for debt maturity and other control variables for the determinants of debt maturity

3.4.1.3.1. Proxies for debt maturity

This research is based on a number of previous studies and constructs the proxy for debt maturity by using the ratio of long-term debt to total debt (Deesomsak et. al, 2009; Antoniou et. al, 2006). Furthermore, one more new measurement for debt maturity is introduced as the ratio of long-term debt to short-term debt. The reason of using the new measurement is to have a double check for the regression results from the other measurement of debt maturity. There are a number of definitions of long-term debt. In fact, it can be over one-year payables (Scherr and Hulburt, 2001), over three-year payables (Barclay and Smith, 1995), or over five-year payables (Schiantarelli and Sembenelli, 1997). In this study, long-term debt means the debt has maturity is over 1 year. From these two proxies of debt maturity, it is said that the higher the ratio of the two proxies, the more long-term debt is used in firms.

3.4.1.3.2. Managerial traits

Besides the main control variable of overconfident managers, other managerial attributes were also collected, including gender, age, education, and duality (holding the current position as well as that of chairperson). Based on the studies of Malmendier et al. (2011), Graham et al. (2013) and Orens and Reheul (2013), managerial gender, age, education, and duality have a significant relationship with corporate decisions. Hence, this study also develops these variables to examine the relationship between managerial overconfidence and debt maturity.

Gender: Different genders are believed to have different effects on corporate management. For example, male managers are more likely to have higher debt ratios and especially higher short-term debt ratios than female managers (Graham et al., 2013), while female auditors tend to have more discretion in income reporting and be more conservative than their male counterparts (Niskanen et al., 2011). Therefore, it is also believed that there might be a significant impact of gender on debt maturity decision and male managers are suggested to prefer more short-term debt over long-term debt compared to their female counterparts.

Duality: Duality means that the manager is also the chairperson of the firm. According to Jensen (1993), the manager and the chairperson tend to dominate the firm's operations,

hence affecting firm performance. Duality is also mentioned as a factor affecting corporate decisions in the studies by Baliga et al. (1996) and Nahar (2004). Dual responsibility might make the manager tend to hold excess cash to protect the position (Dahya and Travlos, 2000). It seems that when managers have the position of chairperson along with the management position, they might be more careful in their decisions to protect their assets and their positions. Hence, it is assumed that if the manager is in duality, they tend to hold longer-term debt. In this study, duality is denoted as 1 if the manager is also the chairperson and 0 if the manager does not hold the chairperson position.

LogManager's Age: Age of interviewees was collected through interviews and annual reports. Age is stated to affect management decisions (Orens and Reheul, 2013); therefore, it is also supposed to have a significant relationship with decisions related to debt maturity. We assume that younger managers tend to be more overconfident and can have a risk-preference compared to older managers. Hence, we assume that the manager's age has a positive impact on debt maturity. As age is a continuous numeric variable, it is converted to logarithmic form to run the model.

Manager's Education: Manager's education is the measurement of the manager's qualification. According to Lichtenstein and Fischoff (1977), education might determine people's decision-making. Accordingly, people with a high level of education might be less confident in their decisions due to a greater understanding of various aspects and be more cautious to avoid failures (Koriat et al., 1980). Thus, it is supposed that a higher level of manager's education tends to hold longer-term debt maturity. There are 0 points for managers holding degrees below university level, 1 for a bachelor degree, 2 for holding a master's degree, and 3 if the manager holds a doctoral degree. The point arrangement is based on Rakhmayil and Yuce (2011) and Ting et al. (2015) but is modified for this research.

3.4.1.3.3. Control variables

Ownership concentration:

Ownership concentration is normally measured by the percentage of common shares owned by the largest three shareholders in firms (La Porte et al., 1998, Guney et al., 2006). According to Marchica (2008), different categories of ownership with different knowledge, abilities and incentives might have different impacts on debt maturity decisions, and ownership concentration is believed to have a significant impact on debt maturity (Arslan

and Karan 2006). Additionally, Arslan and Karan (2006) also indicate that the higher the level of ownership concentration, the more preference for using longer-term debt. Following that, it is expected there is a positive relationship between ownership concentration and debt maturity in this study.

Foreign ownership:

Foreign ownership is seen as one of the important factors affecting corporate management. For example, Li et al. (2009) indicate that foreign ownership has a negative relationship with leverage, and foreign ownership is also stated to have a positive impact on firm performance (Douma et al., 2006, Aydin et al., 2007) and firm-profitability (Caves, 1996, Aitken and Harrison., 1999, Perez-Gonzales, 2004, Arnold and Javorcik, 2005, Chari et al., 2012). From these conclusions, we can also examine the role of foreign ownership in terms of debt maturity. As it is shown to have a negative association with leverage, we assume that it has a positive impact on debt maturity.

State ownership:

Li et al. (2009) conclude that firms with state ownership tend to have more debt in the capital structure and also prefer using long-term debt. However, state ownership is also found to have worse performance than comparable private firms (Dewenter and Malatesta, 2001). Following that, we suggest that there is a positive relationship between state ownership and debt maturity.

Liquidity:

There have been many papers on the association between debt maturity and liquidity. In fact, Johnson (2003) indicates that short-term debt increases the liquidity risk when the due dates of obligations are too quick. Furthermore, Diamond (1991) and Datta et al. (2005) demonstrate that a firm with low liquidity risk can find it easier to choose short-term debt than high liquidity risk firms. From those findings, we think that there should be a significant relationship between liquidity and short-term debt. Accordingly, liquidity in this research is predicted to have a negative impact on debt maturity.

LogAssetMaturity:

According to Stohs and Mauer (1996), larger and less risky firms with longer-term asset maturities are more likely to use longer-term debt. Actually, most scholars confirm that firms tend to choose debt maturity that matches the firm's asset maturity (Myers, 1977, Mitchell, 1991, Ozkan, 2000, Díaz-Díaz et al., 2016). Furthermore, the matching

hypothesis suggests that debt maturity has a positive relationship with asset maturity. Hence, we also believe that asset maturity positively affects debt maturity. The variable of asset maturity is transferred to the logarithmic form for a better estimation of the regression.

Dividend:

In fact, the role of dividends has not been mentioned when examining the determinants of debt maturity in previous studies. However, it is demonstrated to positively impact on firm performance (Uwuigbe et al., 2012, Ouma, 2012) and some other aspects of corporate management such as cash holdings (Opler et al., 1999, Ozkan and Ozkan, 2004). Thus, we expect that the dividend might also play a significant role in debt maturity choices in corporate management. Also, we assume that if firms pay many dividends, they should have a longer-term debt to mitigate the liquidity risk. Dividend per share is used as the variable for dividends in this study.

Leverage

Leverage is illustrated as a determinant of debt maturity (Terra, 2009, Awartani et al., 2015). Awartani et al. (2015) also indicate that the effect of leverage on debt maturity is significantly positive. This study, therefore, also assumes that leverage has a significant positive impact on debt maturity. Leverage is measured by two proxies, namely the ratio of total debt to total assets (Steijvers and Niskanen, 2013, Al-Najjar, 2011, 2013, Kalcheva and Lins, 2007, Subramaniam et al., 2010) and the ratio of total debt to total equity (García-Teruel and Martínez-Solano, 2008).

Profitability: measured by return on assets (ROA)

Profitability was used as a determinant of debt maturity in a study of Terra (2009). In fact, profitability is considered as an important factor affecting some aspects of corporate management such as cash holding decisions (Fresard, 2010); therefore, it is supposed to have a significant impact on debt maturity decisions. We assume that there is a negative relationship between profitability and debt maturity. This study uses ROA as the proxy for profitability, and ROA is defined similarly to return on assets from Fresard (2010), meaning that ROA equals earnings before interest and tax divided by total assets.

Intangible assets

There have been a number of studies doing research on examining the relationship between asset maturity and debt maturity (Stohs and Mauer, 1996, Myers, 1977, Mitchell, 1991,

Ozkan, 2000) or intangible assets and leverage (Myers and Majluf, 1984, Elyasiani et al., 2002), but no studies mention the association between intangible assets and debt maturity. In fact, we believe that there is a significant impact of intangible assets and debt maturity because if firms tend to have more intangible assets, we think they should have more long-term debt. Intangible assets are calculated by the ratio of total intangible assets to total assets, which is the same as Lin and Su (2008) and Martínez-Sola, García-Teruel and Martínez-Solano (2010).

Firm age

According to Custódio et al. (2013), there is a significantly positive relationship between firm age and debt maturity. Scherr and Hulburt (2001) explain that older firms seem to be more stable than younger firms, hence it is pointed out that older firms tend to have more long-term debt than younger firms. However, in the study of Magri (2010) firm age is found to have an inverted U-shape in relation to debt maturity. So, we use firm age as an explanatory variable of debt maturity to examine the impact of firm age on debt maturity in the Vietnamese context and we expect that the relationship in this study is significantly positive.

3.4.2. Model and regression results

3.4.2.1. Debt maturity and overconfident managers model

After reviewing a number of determinants of debt maturity and analysing the basis to construct the model for this study, and with the main purpose of this study being to investigate the impact of managerial overconfidence on debt maturity, we construct the model as follows.

$$DebtMatur_i = \alpha_0 + \alpha_1 Overconfidence_j + \alpha_2 Gender_j + \alpha_3 Duality_j +$$
$$\alpha_4 LogMaAge_j + \alpha_5 LogMaEdu_j + \alpha_6 OConcentration_i + \alpha_7 FO_i + \alpha_8 SO_i +$$
$$\alpha_9 Liquidity_i + \alpha_{10} LogAssetMaturity_i + \alpha_{11} Dividend_i + \alpha_{12} Leverage_i +$$
$$\alpha_{13} Profitability_i + \alpha_{14} Intangible_i + \alpha_{15} LogFirmage_i + e_i \qquad (3)$$

As analysed in the previous section, we have the descriptions of all variables and the predicted signs for explanatory variables as follows.

Variables	Symbol	Explanation	Predicted sign	Data source
Dependent variables				
Debt maturity 1	Debtmatur1	Long-term debt divided by short-term debt		Thomson Reuter Eikon; Annual reports
Debt maturity 2	Debtmatur2	Long-term debt divided by total debt		Thomson Reuter Eikon; Annual reports
Main explanatory variables				
Overconfident manager 1	Overconfidence 1	Measured by voice pitch adjustment	-	Interviews
Overconfident manager 2	Overconfidence 2	Measured by the scale of CEO's photos showed in the firms' 2016 annual reports	-	Annual reports
Comprehensive index	Overconfidence 3	The comprehensive index combined from overconfidence 1 to overconfidence 2	-	Manual calculation
Managerial traits explanatory variables				
Manager's gender	Gender	Gender of CEO and Gender of other managers, 1 if he is male, otherwise 0	-	Annual reports
Duality	Duality	Manager is also the chairperson of the company. It is a dummy variable, 1 if the manager holding two management positions, in which one is chairperson, 0 if otherwise	+	Interviews; Annual reports
Managers' Age	LogMaAge	The logarithm of age of managers	+	Interviews; Annual reports
Managers' Education	LogMaEdu	Qualifications of managers, it is the logarithm of manager's points of education. The point for it is 0 for managers holding degrees below university; 1 for Bachelor degree; 2 for holding a master degree; 3 if the manager holds a doctoral degree.	+	Interviews; Annual reports
Other control variables				
Ownership concentration	OConcentration	The total percentage of top 3 owners of the firms	+	Thomson Reuter Eikon; Annual reports Handling calculation
Foreign ownership	FO	The total percentage of foreign ownership	+	Thomson Reuter Eikon; Annual reports Handling calculation
State	SO	The total percentage of state	+	Thomson Reuter

ownership		ownership		Eikon; Annual reports Handling calculation
Liquidity	Liquidity	Calculated by current ratio that is equal current assets divided by current liabilities	-	Thomson Reuter Eikon; Annual reports. Handling calculation
Assets maturity	LogAssetMaturity	Asset maturity is calculated by net of property plants and equipment divided by depreciation. It is after that transferred into logarithm form	+	Thomson Reuter Eikon; Annual reports. Handling calculation
Dividend	Dividend1; and Dividend2	There are two proxies of dividend namely: Dividend Paid divided by Profit after tax; and Dividend per share	+	Thomson Reuter Eikon; Annual reports.
Financial leverage	Leverage1; and Leverage2	There are two proxies of financial leverage namely: Total debt divided by total equity; and Total debt divided by total assets	+	Thomson Reuter Eikon and Annual reports.
Profitability	Profitability	The proxy is Return on Assets (ROA). It is measured by Earning before interest and tax divided by total assets	-	Thomson Reuter Eikon; Annual reports.
Intangible assets	Intangible	Measured by total intangible assets divided by total assets	+	Thomson Reuter Eikon; Annual reports.
Firm's age	LogFirmage	The logarithm of number of years after founding to 2016	+	Thomson Reuter Eikon; Annual reports.

Table 3.1: Expected signs of variables for determinants of debt maturity

3.4.2.2. *Descriptive statistics*

The descriptive statistics of all variables used to test the influence of overconfident managers on debt maturity are given in table 3.2. The proxy used to represent the dependent variable of debt maturity is Debtmatur1 and Debtmatur2. Those are calculated by two measurements; one is long-term debt divided by short-term debt, another is long-term debt divided by total debt. In terms of overconfidence, the three proxies taken and measured through voice pitch analysis and CEOs' photos are represented as Overconfidence1, Overconfidence2, and Overconfidence3, respectively. The data is trimmed at 1% and 99% to delete some outliers that could interfere with the results. After putting the data into STATA, the numbers of observations is reduced from 123 to the range of 101 and 108, depending on the missing data from variables.

Variable	Observation	Mean	Std. Dev.	Min	Max
Dependent variables					
Debtmatur1	101	3.511	11.735	0.000	81.229
Debtmatur2	108	0.39	0.36	0.00	1.00
Main explanatory variables					
Overconfidence1	104	0.679	0.166	0.400	0.981
Overconfidence2	108	1.472	0.932	1.000	4.000
Overconfidence3	108	0.565	0.568	0.000	2.000
Other manager's traits variables					
Gender	108	0.769	0.424	0.000	1.000
Duality	108	0.083	0.278	0.000	1.000
MaAge	106	41.274	5.935	30.000	57.000
LogMaAge	106	1.611	0.061	1.477	1.756
MaEdu	104	1.385	0.527	0.000	2.000
LogMaEdu	102	0.124	0.149	0.000	0.301
Other control variables					
OConcentration	107	1.255	5.326	0.059	39.630
FO	107	0.076	0.119	0.000	0.490
SO	107	0.183	0.261	0.000	0.960
Liquidity	108	1.983	1.787	0.169	11.115
LogAssetMaturity	101	1.066	0.577	-0.208	2.962
Dividend1	104	0.788	1.019	0.000	4.987
Dividend2	105	0.447	0.675	0.000	4.249
Leverage1	105	0.261	0.196	0.000	0.736
Leverage2	103	1.012	1.182	0.000	5.538
Profitability	105	0.074	0.089	-0.188	0.385
Intangible	105	0.026	0.082	0.000	0.547
Firmage	108	22.963	13.846	4.000	58.000
LogFirmage	108	1.281	0.271	0.602	1.763

Table 3.2: Descriptive statistics for the sub-sample size debt maturity model

The statistics generally show that the minimum level of debt maturity for Vietnamese firms is no debt and the maximum level of that is about 81.3 times the long-term debt compared to short-term debt, and 100% of using only long-term debt in firms, and the average of using long-term debt for firms is 11.7 times compared to short-term debt and accounts for 36% in the debt structure. For the overconfidence variable, for some reasons including refusing to consent to the recording of the interviews, the data are not fully collected. In terms of voice pitch measurement, after adjusting, the range is from 0.4 to 0.981 with a mean of 0.679; for photo size, it ranges from 1 to 4; and for the comprehensive index, it ranges from 0 to 2 depending on the total point from the two different overconfidence measurements with the mean value of 0.565.

The statistics of the gender and duality variables show that 76.9% of respondents are male and 8.3% managers hold the position of chairperson along with the other position on the board of management. The age of managers in this study is from 30 to 57, and the data of manager age after that is transferred to logarithmic form for a better fit of the regression measurement and this ranges from 1.477 to 1.756. The mean for the manager's qualification is 1.385, ranging from 0 to 2. The ownership concentration is between 5.9% and 39.63%. The data on foreign ownership indicates that the highest ownership is 49%,

while the majority of firms have a very small number of foreign owners and the mean value is only 7.6%. In terms of state ownership, a number of firms have state ownership of up to 96%, while some firms are independent of the state.

For the other control variables, Liquidity, LogAssetMaturity, Dividend1, Dividend2, Leverage 1, Leverage 2, Profitability, Intangible assets, and logarithm of Firm age have mean values of 1.983, 1.066, 0.788, 0.447, 0.261, 1.012, 0.074, 0.026, 1.281, respectively.

3.4.2.3. Correlation Matrix

Following the correlation matrix in table 3.3, it is reported that there is a positive relationship between overconfident managers and debt maturity for all proxies of confident managers. These relationships seem to be different from the expected signs of this study, shown in table 3.1. Regarding the other managerial attributes, such as gender, manager's age and manager's education, it is shown that the signs are the same as predicted, while duality has a different impact on debt maturity than predicted. For the other control variables of debt maturity, it is shown that there are positive relationships between ownership concentration, foreign ownership, liquidity, asset maturity, leverage (both of two proxies, but the result showed only one proxy) and debt maturity, while state ownership, dividend (both of two proxies, but the result showed only one proxy), profitability, intangible assets and firm age are represented with negative effects on debt maturity. From these results of the correlation matrix, the signs of state ownership, liquidity, dividend, intangible assets and firm age seem to be different from the prediction for the variable signs. Actually, the results from the correlation matrix are just a reference for the regression results, because they are not strong enough to conclude the effects of those variables on debt maturity. Therefore, some regressions are run in the following sections to confirm the impact of all given explanatory variables on debt maturity.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Debtmatur1 (1)	1.000																		
Debtmatur2 (2)	0.477	1.000																	
Overconfidence1 (3)	0.010	0.033	1.000																
Overconfidence2 (4)	0.196	0.309	0.003	1.000															
Overconfidence3 (5)	0.123	0.175	0.828	0.297	1.000														
Gender (6)	-0.115	-0.087	0.651	-0.083	0.481	1.000													
Duality (7)	-0.067	-0.011	0.074	-0.112	0.000	0.060	1.000												
LogMaAge (8)	0.022	0.021	-0.201	0.042	-0.166	-0.228	0.017	1.000											
LogMaEdu (9)	0.053	0.013	0.185	0.089	0.198	0.190	-0.059	-0.111	1.000										
Oconcentration (10)	0.120	0.061	-0.159	-0.008	-0.104	-0.057	-0.211	-0.209	0.153	1.000									
FO (11)	0.156	0.281	0.067	0.327	0.106	-0.096	-0.177	-0.140	0.119	0.076	1.000								
SO (12)	-0.117	-0.125	0.099	0.000	0.175	0.160	-0.204	-0.018	0.145	0.318	-0.181	1.000							
Liquidity (13)	0.007	0.274	-0.009	0.006	0.062	0.037	-0.068	-0.046	0.004	-0.101	0.125	-0.057	1.000						
LogAssetmaturity (14)	0.124	0.413	0.125	0.028	0.135	-0.010	0.021	-0.029	0.160	0.103	0.234	-0.206	0.311	1.000					
Dividend1 (15)	-0.042	-0.121	-0.090	0.011	-0.205	-0.135	-0.150	0.140	0.038	0.017	0.014	0.143	-0.096	-0.184	1.000				
Leverage1 (16)	0.124	0.113	-0.101	-0.061	-0.155	-0.085	0.127	-0.080	-0.034	0.005	-0.087	-0.160	-0.402	0.004	-0.137	1.000			
Profitability (17)	-0.036	-0.092	-0.011	-0.041	-0.056	-0.134	-0.176	0.137	0.195	-0.014	0.215	0.046	0.128	-0.236	0.595	-0.306	1.000		
Intangible (18)	-0.043	0.082	-0.075	-0.028	0.029	0.045	0.227	-0.045	-0.167	-0.242	-0.090	-0.157	0.381	0.058	-0.152	-0.128	-0.070	1.000	
LogFirmage (19)	-0.266	-0.282	0.052	-0.265	0.022	0.058	-0.087	0.003	0.076	0.131	-0.186	0.067	-0.062	0.070	0.098	0.061	0.017	-0.142	1.000

Table 3.3: Correlation matrix for the sub-sample size debt maturity model

3.4.2.4. Findings and empirical results

The data type for the sub-sample size is cross-sectional data; therefore, the OLS regression is not good enough to run the regressions, because there might be a problem of heterogeneity in the model with cross-sectional data (Gujarati, 2009). To avoid some problems from the OLS estimation, we use the GLS regression to test the impact of managerial overconfidence and other control variables on debt maturity.

INDEPENDENT VARIABLES	DEPENDENT VARIABLE					
	Debt maturity					
	Debtmatur1 (1)	Debtmatur2 (2)	Debtmatur1 (3)	Debtmatur2 (4)	Debtmatur1 (5)	Debtmatur2 (6)
MAIN EXPLANATORY VARIABLES						
Overconfidence1	17.824*	0.497*				
	(10.764)	(0.267)				
Overconfidence2			1.450	0.061*		
			(1.504)	(0.036)		
Overconfidence3					6.327**	0.173***
					(2.532)	(0.055)
VARIABLE OF MANAGERIAL TRAITS						
Gender	-6.111	-0.125	-1.619	-0.003	-5.450	-0.111
	(4.052)	(0.099)	(3.173)	(0.076)	(3.391)	(0.087)
Duality	-4.559	-0.051	-3.443	-0.015	-3.891	-0.033
	(4.886)	(0.123)	(4.937)	(0.124)	(4.774)	(0.093)
LogMaAge	24.355	1.267**	15.625	1.058**	23.675	1.226**
	(23.544)	(0.558)	(23.603)	(0.556)	(22.892)	(0.628)
LogMaEdu	8.069	0.116	6.395	0.054	6.192	0.059
	(9.151)	(0.226)	(9.362)	(0.229)	(8.996)	(0.248)
OTHER CONTROL FIRM LEVEL VARIABLES						
OConcentration	12.852**	0.323**	9.707	0.243	13.042**	0.319**
	(6.727)	(0.166)	(6.488)	(0.160)	(6.450)	(0.156)
FO	3.532	0.605**	1.579	0.541*	0.998	0.539*
	(11.774)	(0.280)	(12.511)	(0.289)	(11.627)	(0.284)
SO	-7.189	-0.022	-5.829	0.008	-8.655	-0.061
	(5.663)	(0.139)	(5.651)	(0.138)	(5.609)	(0.138)
Liquidity	0.708	0.067***	0.450	0.061***	0.671	0.066***
	(0.989)	(0.024)	(0.986)	(0.024)	(0.961)	(0.025)
LogAssetMaturity	-0.127	0.080	1.272	0.108*	-0.801	0.080
	(2.700)	(0.063)	(2.643)	(0.062)	(2.594)	(0.076)
Dividend1	0.726	0.052	0.273	0.041	0.567	0.049
	(1.533)	(0.038)	(1.550)	(0.038)	(1.495)	(0.040)
Leverage1	12.356	0.342*	11.725	0.293	13.905*	0.369
	(7.991)	(0.190)	(8.063)	(0.188)	(7.881)	(0.227)
Profitability	-16.710	-1.112***	-6.456	-0.867*	-10.911	-0.973**
	(20.223)	(0.474)	(20.754)	(0.478)	(19.563)	(0.475)
Intangible	1.136	0.497	-3.462	0.397	-4.015	0.352
	(16.792)	(0.406)	(16.772)	(0.405)	(16.277)	(0.397)
LogFirmage	-13.999***	-0.268**	-12.528**	-0.203*	-13.981***	-0.267
	(4.858)	(0.118)	(5.023)	(0.122)	(4.760)	(0.131)**
Intercept	-34.632	-2.023	-15.627	-1.585*	-23.653	-1.721
	(41.377)	(0.975)	(40.147)	(0.943)	(39.172)	(1.055)
Number of Obs	*85*	*91*	*85*	*91*	*86*	*92*
Wald chi2	*20.53*	*45.57*	*18.35*	*44.64*	*23.61*	*46.89*
Prob > chi2	*0.1526*	*0.0001*	*0.2448*	*0.0001*	*0.0720*	*0.0000*

Notes: The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1 % level, respectively. The standard errors are robust to heteroscedasticity.
The same results if models are used with different proxies of dividend and leverage

Table 3.4: Regression results of managerial overconfidence and debt maturity

In terms of the whole model, the results from *Wald chi2* and *Pro>chi2* show that the models are strong and appropriate and all explanatory variables are suitable to explain debt maturity. The numbers of total observations are reduced after regressing, depending on each model.

The empirical regression results show that there is a positive relationship between managerial overconfidence and debt maturity at the 10% significance level for the first and the second proxies, but at the 5% significant level for the third proxy. Almost all models of the three proxies of managerial overconfidence and the two proxies of debt maturity produce the same results in all models. Only the model with Overconfidence2 and Debtmatur1 are insignificant.

In terms of the other managerial trait variables, just the variable of managerial education is found to have a positive significant impact on debt maturity at both the 5% and 10% significance levels in different models. Meanwhile, for all other managerial traits, there is no evidence supporting their relationship with debt maturity.

Regarding other control variables at the firm level, there is evidence indicating that ownership concentration, foreign ownership, liquidity, asset maturity, leverage, profitability, and firm age significantly affect debt maturity. Hereby, ownership concentration, foreign ownership, liquidity, and firm age seem to be significantly stronger than the remaining variables as more models are shown with the significance levels at 1% and 5%. Among those significant variables, ownership concentration, foreign ownership, liquidity, assets maturity, and leverage show a significant positive effect on debt maturity, while profitability and firm age are indicated to have a negative relationship with debt maturity. In contrast, there is no evidence confirming any association between state ownership, dividends, and intangible assets with debt maturity.

3.4.2.5. *Do overconfident managers lead to a higher deviation in the target debt maturity?*

Now, we move on to the regression results for the second hypothesis of this study, which examines the impact of managerial overconfidence on the deviation between actual debt maturity level and the optimal debt maturity level. Before analysing the empirical regression results for this section, we provide the model for the second hypothesis in the following:

$$DeviDebt_i = \beta_0 + \beta_1 Overconfidence_j + \beta_2 Gender_j + \beta_3 Duality_j + \beta_4 LogMaAge_j + \beta_5 LogMaEdu_j + \beta_6 OConcentration_i + \beta_7 FO_i + \beta_8 SO_i + \beta_9 Liquidity_i + \beta_{10} LogAssetMaturity_i + \beta_{11} Dividend_i + \beta_{12} Leverage_i + \beta_{13} Profitability_i + \beta_{14} Intangible_i + \beta_{15} LogFirmage_i + \partial_i \qquad (4)$$

The deviation between the actual debt maturity level and the target debt maturity is calculated by the absolute value of the dependent variable of debt maturity minus the fitted value of debt maturity. The deviation is denoted as "DeviDebt", whereby there are two measurements of deviation that come from two different proxies of debt maturity, namely "DeviDebt1" and "DeviDebt2" for deviation of the first proxy of debt maturity and the deviation of the second one, respectively. The fitted value is found after running the first regression of the first model. Learning from the study of Opler et. al (1999), the target level of a dependent variable can be found by the use of the fitted value of a cross-sectional regression of the dependent variable. Hence, we believe that the fitted value can be seen as the optimal level of debt maturity because it is an appropriate result of the model after finding the coefficients of the models.

It is predicted that the more the overconfidence of managers, the higher the deviation level between actual debt maturity and targeted debt maturity will be. Logically, managers who are overconfident might be more aggressive in their management decisions; therefore, they might tend to hold more short-term debt. Due to the concentration on short-term debt, they are assumed to create more bias between the actual level of debt maturity and the optimal level of debt maturity.

The regression results from table 3.5 indicate that all models constructed are strong and appropriate with significant results of *Wald chi2* and *Prob>chi2* except the model of DeviDebt2 (10). All independent variables are also suggested as being suitable to explain the deviation. Most importantly, it is seen that all significant models show the same outcomes in terms of demonstrating the association between deviation and managerial overconfidence. That means it is represented that there is a positive relationship between managerial overconfidence and deviation. All significant models are significant at the 1%, 5% and 10% levels. Only the models of Overconfidence2, with a deviation of the first proxy of debt maturity, and one model from Overconfidence 2 and Overconfidence3 with the second proxy of debt maturity show no evidence of a significant relationship between managerial overconfidence and deviation.

Besides the results of managerial overconfidence, for other managerial trait variables, it is shown that there is some evidence suggesting the existence of a negatively significant

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relationship between gender and duality with deviation. Duality is believed to be a stronger explanatory variable for deviation as more models indicate significant results. Meanwhile, there is no evidence to suggest a significant impact of manager's age and manager's education with deviation.

INDEPENDENT VARIABLES	DEPENDENT VARIABLE					
	Deviation					
	DeviDebt1 (7)	DeviDebt2 (8)	DeviDebt1 (9)	DeviDebt2 (10)	DeviDebt1 (12)	DeviDebt2 (10)
MAIN EXPLANATORY VARIABLES						
Overconfidence1	19.476***	0.216*				
	(8.273)	(0.126)				
Overconfidence2			1.351	-0.030		
			(1.197)	(0.018)		
Overconfidence3					6.102***	-0.008
					(1.888)	(0.032)
VARIABLE OF MANAGERIAL TRAITS						
Gender	-5.454*	-0.036	-0.827	0.012	-3.842	0.006
	(3.114)	(0.047)	(2.526)	(0.038)	(2.529)	(0.041)
Duality	-2.954	-0.137***	-1.736	-0.127**	-2.133	-0.112*
	(3.756)	(0.058)	(3.930)	(0.062)	(3.561)	(0.060)
LogMaAge	21.230	0.223	9.017	0.152	19.966	0.194
	(18.096)	(0.263)	(18.786)	(0.280)	(17.075)	(0.270)
LogMaEdu	4.006	0.021	3.722	0.068	-1.130	0.022
	(7.033)	(0.106)	(7.452)	(0.115)	(6.710)	(0.110)
OTHER CONTROL FIRM LEVEL VARIABLES)						
OConcentration	11.957**	0.175**	10.480**	0.163**	10.148**	0.150**
	(5.170)	(0.078)	(5.164)	(0.080)	(4.811)	(0.079)
FO	-0.471	-0.007	-2.724	0.090	-3.784	0.015
	(9.049)	(0.132)	(9.958)	(0.145)	(8.673)	(0.138)
SO	-8.357**	-0.102	-6.758	-0.065	-7.982**	-0.064
	(4.353)	(0.066)	(4.498)	(0.070)	(4.184)	(0.069)
Liquidity	0.871	-0.014	0.296	-0.028***	0.846	-0.018
	(0.760)	(0.011)	(0.785)	(0.012)	(0.717)	(0.012)
LogAssetMaturity	-1.797	0.004	0.011	0.026	-1.507	0.010
	(2.075)	(0.030)	(2.104)	(0.031)	(1.935)	(0.030)
Dividend1	1.557	0.050***	1.349	0.056***	1.221	0.040**
	(1.178)	(0.018)	(1.234)	(0.019)	(1.115)	(0.018)
Leverage1	11.573*	-0.028	9.617	-0.081	13.305**	-0.042
	(6.142)	(0.089)	(6.417)	(0.095)	(5.879)	(0.093)
Profitability	-15.609	-0.503**	-6.760	-0.557**	-8.358	-0.331
	(15.544)	(0.224)	(16.518)	(0.240)	(14.592)	(0.229)
Intangible	-1.802	0.393**	0.710	0.516***	-8.136	0.423**
	(12.906)	(0.192)	(13.350)	(0.203)	(12.141)	(0.197)
LogFirmage	-12.319***	-0.126**	-10.541***	-0.105*	-10.917***	-0.091
	(3.734)	(0.056)	(3.998)	(0.061)	(3.550)	(0.057)
Intercept	-29.403	-0.119	-4.929	0.111	-19.948	-0.014
	(31.802)	(0.460)	(31.954)	(0.474)	(29.217)	(0.459)
Number of Obs	85	91	85	91	86	92
Wald chi2	25.44	26.96	19.54	30.24	25.01	12.79
Prob > chi2	0.0443	0.029	0.1901	0.0111	0.0498	0.6185

Notes: The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1 % level, respectively. The standard errors are robust to heteroscedasticity.
The same results if models are used with different proxies of dividend and leverage

Table 3.5: Regression results of the deviation from the optimal debt maturity level

In terms of the other control variables at the firm level, the results show a significant impact from ownership concentration, state ownership, liquidity, dividend, leverage, profitability, intangible assets, and firm age on deviation. Meanwhile, there is no significant relationship between foreign ownership, asset maturity and deviation. Among all significant variables, leverage seems to be the least confident as only one model supports the significant result.

Additionally, ownership concentration, dividend, leverage, and intangible assets are represented with positive impacts on deviation, while state ownership, liquidity, profitability, and firm age are shown to have a negative association with deviation.

3.4.2.6. *Debt maturity and overconfidence in extended sample size*

To avoid bias in the regression due to the small sample size, this section uses an extended sample size with the available data of the second proxy for managerial overconfidence to test again the impact of managerial overconfidence on debt maturity and also on the deviation between the actual debt maturity level and the targeted debt maturity level. We expect the results from this extended sample size to support the results of a small sample size. The extended sample size is expanded to the whole population of all non-financial Vietnamese listed firms. The total number of non-financial Vietnamese listed firms is 648; however, it is reduced after regression due to the missing and inappropriate data type from each model. The total number of observations after regression is recorded reduces from 648 to the range of 447 and 536, depending on each model. The results of *Wald chi2* and *Prob>chi2* show that all models are strong and appropriate. For the regression model of this section, the GLS model is also applied to avoid drawbacks from the OLS model for cross-sectional data.

The regression results indicate the same results of a significant relationship between managerial overconfidence and debt maturity and also with deviation. With all proxies of debt maturity, managerial overconfidence is indicated as having a positive impact on debt maturity at the 1%, 5% and 10% levels of significance. Only two models between managerial overconfidence and deviation of debt maturity 2 show insignificant results.

For other traits of managers, only the manager's age is illustrated having a significantly positive relationship with debt maturity and deviation in all models. In terms of all other control variables, except profitability, there is strong evidence showing that all of the firm-level control variables significantly affect debt maturity and deviation. The strongest variables used to explain debt maturity and deviation are ownership concentration, state ownership and asset maturity, all of which are demonstrated as having a strong positive impact on debt maturity and deviation in all models at almost the 1% significance level. The positive relationships with both debt maturity and deviation are also proved for the variables of foreign ownership, liquidity, leverage, and intangible assets. Only dividend and firm age are described as having negative impacts on two dependent variables of the two

main models.

INDEPENDENT VARIABLES	DEPENDENT VARIABLE			
	GLS regression			
	Debtmatur1 (13)	DeviDebt1 (114)	Debtmatur2 (15)	DeviDebt2 (16)
MAIN EXPLANATORY VARIABLE				
Overconfidence2	0.223**	0.114**	0.032*	-0.009
	(0.096)	(0.060)	(0.018)	(0.009)
VARIABLE OF MANAGERIAL TRAITS				
Gender	0.158	0.023	0.030	-0.005
	(0.317)	(0.198)	(0.058)	(0.030)
Duality	-0.215	-0.145	-0.032	-0.015
	(0.184)	(0.115)	(0.034)	(0.017)
LogMaAge	1.972**	1.953***	0.535***	0.419***
	(1.035)	(0.647)	(0.192)	(0.099)
LogMaEdu	-0.220	-0.080	0.007	0.021
	(0.522)	(0.326)	(0.098)	(0.050)
OTHER CONTROL FIRM LEVEL VARIABLES				
OConcentration	1.396***	0.869***	0.203**	0.087***
	(0.372)	(0.233)	(0.069)	(0.035)
FO	1.363**	0.583	0.161	0.039
	(0.691)	(0.432)	(0.126)	(0.065)
SO	1.136***	1.212***	0.190***	0.074**
	(0.391)	(0.244)	(0.072)	(0.037)
Liquidity2	0.105***	0.069***	0.007	0.006**
	(0.040)	(0.025)	(0.005)	(0.003)
LogAssetMaturity	0.871***	0.511***	0.189***	0.057***
	(0.167)	(0.104)	(0.030)	(0.015)
Dividend	-0.090	-0.054	-0.030*	-0.006
	(0.090)	(0.056)	(0.017)	(0.009)
Leverage1	1.695***	1.413***	0.137*	-0.106***
	(0.463)	(0.289)	(0.082)	(0.042)
Profitability	-1.172	0.089	-0.054	-0.139
	(1.389)	(0.868)	(0.228)	(0.117)
Intangible	1.910	1.513	0.797**	0.446***
	(2.122)	(1.326)	(0.361)	(0.186)
LogFirmage	-0.278	-0.432*	-0.083	-0.094***
	(0.409)	(0.255)	(0.077)	(0.040)
Intercept	-4.713***	-3.450***	-0.928***	-0.410***
	(1.799)	(1.124)	(0.333)	(0.171)
Number of Obs	*448*	*448*	*536*	*536*
Wald chi2	*104.53*	*133.01*	*92.74*	*75.68*
Prob > chi2	*0*	*0*	*0*	*0*

Notes: The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1 % level, respectively. The standard errors are robust to heteroscedasticity.
The same results if models are used with different proxies of dividend and leverage

Table 3.6: Regression results for the extended sample size of debt maturity

3.4.2.7. *Determinants of debt maturity: the case of general control variables*

To check more carefully the appropriation of all other control variables at the firm level in the main empirical model, we use panel data of all non-financial Vietnamese listed firms from 2005 (the starting year of Vietnamese stock market) to 2016 (the year of conducting this research) to run the regression. We expect that all the control variables we use in the main model are suitable.

The total number of observations in this part is from 3794 to 4590, depending on each model. As the data type is panel data, we mainly based on the fixed effect regression results. Actually, both the random effects and fixed effects are tested and then we use the

Hausman test to find out which method is suitable. Finally, the Hausman test shows that the fixed effect is an appropriate regression in this section. Furthermore, we also run the GLS test to support the results of the fixed effect regression. The results indicate that for both the GLS and FE regressions, the whole model is appropriate with significant results of *Wald chi2, Pro>chi2* from GLS and *F-test, Prob>F* from FE regression.

INDEPENDENT VARIABLES	DEPENDENT VARIABLE			
	Debtmaturity			
	Debtmatur1 (GLS) (17)	Debtmatur1 (FE) (18)	Debtmatur2 (GLS) (19)	Debtmatur2 (FE) (20)
Liquidity2	0.569***	0.867***	0.014***	0.017***
	(0.060)	(0.074)	(0.003)	(0.003)
LogAssetMaturity	1.181***	0.618***	0.121***	0.059***
	(0.184)	(0.232)	(0.011)	(0.011)
Dividend	-0.028	-0.037	-0.017***	-0.006
	(0.102)	(0.099)	(0.006)	(0.005)
Leverage1	4.945***	5.234***	0.397***	0.469***
	(0.490)	(0.705)	(0.028)	(0.036)
Profitability	-0.913	-0.477	-0.014	0.091
	(1.269)	(1.426)	(0.070)	(0.068)
Intangible	-1.327	5.468**	0.045	0.094
	(1.949)	(2.746)	(0.113)	(0.131)
Intercept	-1.739***	-1.991***	0.059***	0.073***
	(0.315)	(0.399)	(0.017)	(0.018)
Number of Obs	3794	3794	4584	4584
Wald chi2	199.58		411.77	
Prob > chi2	0.000		0.000	
F test		27.96		38.15
Prob > F		0.000		0.000

Notes: The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1 % level, respectively. The standard errors are robust to heteroscedasticity.

Table 3.7: Regression results of debt maturity determinants: general control variables

Almost all models represent the same very strong results at the 1% significance level except dividend and intangible assets, which showed less significance. Only the variable of profitability is considered to have no evidence of a significant impact on debt maturity. Among those significant variables, there are positive relationships between liquidity, asset maturity, leverage, and intangible assets and debt maturity. Meanwhile, the only dividend is shown to have a negative association with debt maturity.

3.4.2.8. Endogeneity problem and GMM estimation

From the regression model, we can see that there might be a problem of endogeneity in the empirical regression model. In fact, if there is a problem of endogeneity in the model, the OLS, GLS become less strong estimations. Hence, we need to identify the endogeneity in the model and apple more appropriate regression estimations. Endogeneity is in which an explanatory variable is correlated with the error term or other omitted variables. In the relation with this research, a number of papers have found a relationship between some control variables in this study's model with other variables, especially variables appearing

in the regression model of this study. For example, dividend can be explained by yield, firm size, profitability, debt to equity ratio, leverage and liquidity (Patra et al., 2012), or by profitability, firm risk, net cash flow, tax, institution ownerships, firm growth and firm value (market to book value) (Amidu and Abor, 2006). Leverage can be impacted by assets maturity, firm size, profitability, tangible assets, tax rate and net operating loss (Barclay et al., 2003). Profitability (measured by ROA) can be influenced by firm size, initial capital and firm age, as in the research of Kuncová et al. (2016), by firm age, firm size, volume of capital, leverage and loss ratio (Malik, 2011), or by firm size, leverage, liquidity and firm age (Doğan, 2013).

INDEPENDENT VARIABLES	DEPENDENT VARIABLE					
	Debtmaturity (Instrumental variables GMM)					
	Debtmatur1 (21)	Debtmatur2 (22)	Debtmatur1 (23)	Debtmatur2 (24)	Debtmatur1 (25)	Debtmatur2 (26)
MAIN EXPLANATORY VARIABLE						
Overconfidence1	17.640	0.436				
	(11.302)	(0.310)				
Overconfidence2			1.895	0.077**		
			(1.555)	(0.035)		
Overconfidence3					6.300*	0.168***
					(3.648)	(0.051)
VARIABLE OF MANAGERIAL TRAITS						
Gender	-6.112	-0.127	-2.270	-0.046	-5.528	-0.126
	(4.159)	(0.109)	(3.796)	(0.096)	(4.313)	(0.083)
Duality	-4.589	-0.060	-3.918	-0.040	-3.969	-0.045
	(3.742)	(0.099)	(3.638)	(0.126)	(3.715)	(0.100)
LogMaAge	24.307	1.288**	15.166	1.146	23.686	1.266**
	(19.942)	(0.620)	(18.428)	(0.730)	(20.000)	(0.605)
LogMaEdu	7.917	0.065	3.527	-0.098	5.884	0.006
	(14.961)	(0.256)	(13.232)	(0.323)	(13.996)	(0.250)
OTHER CONTROL FIRM LEVEL VARIABLES						
OConcentration	12.760*	0.297**	8.815	0.206	12.904*	0.301**
	(7.022)	(0.155)	(5.449)	(0.169)	(6.925)	(0.140)
FO	3.373	0.588**	-2.540	0.446	0.639	0.517**
	(6.800)	(0.266)	(6.809)	(0.351)	(6.997)	(0.269)
SO	-7.037	0.040	-3.652	0.161	-8.355	0.003
	(6.311)	(0.167)	(5.180)	(0.188)	(6.808)	(0.156)
Liquidity2	0.679	0.056*	0.026	0.034	0.615	0.055**
	(0.961)	(0.031)	(0.876)	(0.036)	(0.961)	(0.028)
LogAssetMaturity	-0.080	0.091	1.901	0.128	-0.003	0.089
	(1.991)	(0.075)	(1.776)	(0.085)	(2.048)	(0.070)
Dividend1	0.487	-0.035	-3.642	-0.195	0.066	-0.045
	(3.956)	(0.171)	(3.882)	(0.183)	(3.944)	(0.156)
Leverage1	12.352	0.316	12.021	0.240	13.911	0.345
	(11.379)	(0.214)	(11.336)	(0.241)	(11.274)	(0.210)
Profitability	-14.862	-0.482	24.278	0.829	-7.119	-0.308
	(41.624)	(1.424)	(37.801)	(1.648)	(40.849)	(1.275)
Intangible	0.976	0.467	-5.479	0.343	-4.259	0.332
	(6.103)	(0.385)	(8.460)	(0.461)	(7.009)	(0.395)
LogFirmage	-13.935	-0.235*	-11.243	-0.104	-13.855*	-0.233*
	(8.641)	(0.131)	(7.141)	(0.140)	(8.085)	(0.127)
Intercept	-34.400	-2.007*	-15.095	-1.716	-25.536	-1.763*
	(26.446)	(1.079)	(26.156)	(1.249)	(26.003)	(1.027)
Number of Obs	85	91	86	92	86	92
Wald chi2	14.69	91.68	15.25	71.91	15.840	102.420
Prob > chi2	0.474	0.000	0.434	0.000	0.393	0.000

Table 3.8:Intrumental variables GMM estimation for cross-sectional model of debt maturity

Therefore, there might obviously be the existence of endogeneity in the regression model of this study. In order to address endogeneity, we use the instrumental variables GMM for the sub-sample size and dynamic panel-data estimation, two-step system GMM (Blundell and Bond, 1998) for the panel data. The GMM model can be seen as the best model to address all problems from all other estimations. The results are represented in table 3.8 and table 3.9. The results of *Wald Chi2* and *Prob > Chi2* suggest that all most all models are valid and appropriate. For the regression results of cross-sectional model (see table 3.8), a half of all models (Model 24, 25 and 26) show significant results among the relationship between managerial overconfidence and debt maturity. For the panel model (see table 3.9), in terms of the results of the first-order autocorrelation (AR1) and the second-order autocorrelation (AR2), it is shown that there is only evidence of the first-order autocorrelation and no evidence of second-order autocorrelation.

INDEPENDENT VARIABLES	DEPENDENT VARIABLE							
	Debtmatur1	Debtmatur2	Debtmatur1	Debtmatur2	Debtmatur1	Debtmatur2	Debtmatur1	Debtmatur2
	GMM (27)	GMM (28)	GMM (29)	GMM (30)	GMM (31)	GMM (32)	GMM (33)	GMM (34)
Liquidity2	-3.337	0.095	-7.954	0.093	-1.958	0.118***	-3.444	0.126***
	(2.774)	(0.061)	(8.862)	(0.062)	(4.146)	(0.048)	(3.365)	(0.050)
LogAssetMaturity	4.018	0.155	10.577	0.161	6.294	0.010	4.688	-0.002
	(4.797)	(0.102)	(10.427)	(0.091)	(4.568)	(0.089)	(4.889)	(0.097)
Dividend1			4.969	-0.012	0.574	-0.004		
			(6.308)	(0.020)	(1.891)	(0.019)		
Dividend2	-2.224	-0.015					-2.676	-0.020
	(4.311)	(0.039)					(4.636)	(0.037)
Leverage1					-1.899	1.190***	-6.470	1.203***
					(11.374)	(0.196)	(12.098)	(0.197)
Leverage2	-1.454	0.116***	-2.754	0.120***				
	(2.017)	(0.046)	(3.371)	(0.046)				
Profitability	9.756	1.164**	46.992	1.129**	13.679	0.925*	8.849	1.022**
	(39.286)	(0.596)	(60.887)	(0.581)	(30.364)	(0.507)	(38.950)	(0.502)
Intangible	2.969	3.546*	82.741	3.205*	1.272	0.868	-14.035	1.080
	(74.467)	(1.884)	(127.111)	(1.843)	(60.587)	(1.233)	(85.114)	(1.266)
Intercept	33.028	0.035	67.174	0.029	28.809	0.174	37.415	0.188
	(55.321)	(0.398)	(136.248)	(0.407)	(37.330)	(0.391)	(50.992)	(0.402)
Number of Obs	*3785*	*4574*	*3782*	*4570*	*3782*	*4564*	*3785*	*4568*
Wald chi2	*19.84*	*28.92*	*7.66*	*29.2*	*23.06*	*69.1*	*22.900*	*71.39*
Prob > chi2	*0.593*	*0.001*	*0.998*	*0.001*	*0.398*	*0.000*	*0.407*	*0.000*
AR (1)	*0.012*	*0.000*	*0.350*	*0.000*	*0.059*	*0.000*	*0.047*	*0.000*
AR (2)	*0.597*	*0.103*	*0.557*	*0.11*	*0.199*	*0.323*	*0.685*	*0.349*
Hansen test	*0.703*	*0.085*	*0.787*	*0.099*	*0.359*	*0.46*	*0.604*	*0.461*
Notes: The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1 % level, respectively. The standard errors are robust to heteroscedasticity.								

Table 3.9:Two-step system GMM estimation for debt maturity determinants

Regarding other control variables, there is several evidences show a positive relationship between ownership concentration and debt maturity. A weak relationship to debt maturity is found from foreign ownership, liquidity and firm age.

3.4.2.9. Comparing of constrained and unconstrained firms

Our analysis is based on the overview of securities, bond, stock and bank markets in

Vietnam mentioned in the previous section. We recognize that there might be a difference in making decisions on debt maturity between financially constrained firms and financially unconstrained firms. Following the research of Almeida and Campello (2007) and also learning from the paper of Hadlock and Pierce (2010), we classify the constrained and unconstrained firms according to the payout ratio (the same approach is also found in the paper of Fazzari et al., 1988) and total assets (the same approach is also found in the papers of Gilchrist and Himmelberg, 1995, Erickson and Whited, 2000). Following that, the dividend payout is calculated by the total dividend paid divided by operating income (the same as the second proxy of dividend in this study). These two measurements are based on the data of all firms from 2005 to 2016. Those two types of data are then ranked as 10 deciles and then the financially constrained firms are identified as firms ranked in the bottom three deciles and the financially unconstrained firms are those ranked in the top three deciles.

The regression results are quite similar between constrained firms and unconstrained firms. The small difference only comes from the dividend of the two models and the intangible assets of three models out of eight models with different proxies for the control variables.

INDEPENDENT VARIABLES	DEPENDENT VARIABLE (GLS regression)															
	Debtmatur1		Debtmatur2		Debtmatur1		Debtmatur2		Debtmatur1		Debtmatur2		Debtmatur1		Debtmatur2	
	Cons (35)	Non (36)	Cons (37)	Non (38)	Cons (39)	Non (40)	Cons (41)	Non (42)	Cons (43)	Non (44)	Cons (45)	Non (46)	Cons (47)	Non (48)	Cons (49)	Non (50)
Liquidity2	0.520***	0.428***	0.018***	0.007	0.520***	0.423***	0.018***	0.006	0.542***	0.506***	0.021***	0.013***	0.543***	0.505***	0.021***	0.014***
	(0.098)	(0.098)	(0.004)	(0.004)	(0.098)	(0.098)	(0.004)	(0.004)	(0.100)	(0.099)	(0.004)	(0.004)	(0.100)	(0.099)	(0.004)	(0.004)
LogAssetMaturity	1.350***	1.222***	0.143***	0.113***	1.356***	1.287***	0.143***	0.118***	1.273***	1.219***	0.139***	0.109***	1.276***	1.157***	0.140***	0.104***
	(0.291)	(0.319)	(0.017)	(0.021)	(0.291)	(0.323)	(0.017)	(0.021)	(0.292)	(0.320)	(0.016)	(0.021)	(0.291)	(0.317)	(0.016)	(0.020)
Dividend1					0.917	-0.067	0.535	0.000	3.242	-0.087	0.734	-0.002				
					(6.991)	(0.080)	(0.447)	(0.006)	(7.003)	(0.079)	(0.444)	(0.005)				
Dividend2	-0.145	-0.147	-0.018	-0.021***									-0.135	-0.087	-0.017	-0.017*
	(0.250)	(0.157)	(0.015)	(0.010)									(0.250)	(0.156)	(0.015)	(0.010)
Leverage1									4.768***	5.063***	0.418***	0.419***	4.724***	4.954***	0.411***	0.416***
									(0.824)	(0.796)	(0.047)	(0.0490)	(0.824)	(0.796)	(0.047)	(0.049)
Leverage2	0.903***	0.666***	0.068***	0.056***	0.907***	0.673***	0.069***	0.056***								
	(0.156)	(0.152)	(0.009)	(0.010)	(0.155)	(0.152)	(0.010)	(0.010)								
Profitability	0.484	2.687	0.182	0.069	0.212	1.195	0.133	-0.051	-0.892	0.743	0.095	-0.046	-0.515	2.017	0.151	0.059
	(1.995)	(2.442)	(0.113)	(0.143)	(1.990)	(2.339)	(0.113)	(0.134)	(1.974)	(2.269)	(0.111)	(0.131)	(1.982)	(2.374)	(0.111)	(0.140)
Intangible	-1.572	-0.635	0.355**	0.029	-1.489	-0.627	0.369*	0.035	-2.005	-0.719	0.345**	0.051	-2.152	-0.724	0.327	0.046
	(3.041)	(2.948)	(0.179)	(0.182)	(3.046)	(2.951)	(0.180)	(0.182)	(3.039)	(2.917)	(0.178)	(0.18)0	(3.034)	(2.916)	(0.178)	(0.180)
Intercept	-1.358***	-1.263***	0.054**	0.089***	-1.384***	-1.223*	0.054*	0.076**	-1.745***	-2.025***	0.008	0.017	-1.736***	-2.100***	0.007	0.024
	(0.466)	(0.504)	(0.026)	(0.030)	(0.468)	(0.530)	(0.026)	(0.031)	(0.500)	(0.551)	(0.028)	(0.032)	(0.501)	(0.533)	(0.028)	(0.031)
Number of Obs	1317	1116	1563	1375	1317	1113	1563	1371	1317	1113	1563	1367	1317	1116	1563	1371
Wald chi2	72.79	43.82	134.07	79.86	72.45	44.49	134.01	74.26	71.87	65.83	163.04	116.23	71.95	63.72	161.44	121.05
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1 % level, respectively.

Table 3.9: Regression results of financially contained and financially unconstrained firms

3.4.2.10. Findings from the answers of interviews

All questions put to the participants mostly aimed at recording the voice pitch and were also used to support the current studies and also future studies. Therefore, only two questions asked are relating to debt maturity, namely the first question and the third question. In the first question, only half of the question is related to debt maturity. In fact, about 93% of respondents understand the benchmark of debt maturity, and most of them stated that decisions on debt maturity depend on the maturity of assets, projects and also the purpose of using capital. Only about 7% said that we sometimes have to be flexible in choosing the maturity of debt and not only base decisions on the maturity of investment projects or assets.

For the third question, all respondents agreed that debt maturity plays a very important role in firm performance. Hence, they are quite careful when making decisions related to debt maturity.

3.4.3. Discussion

The main findings of the two main hypotheses seem to be very different from the expectation. For the first hypothesis, a negative relationship was predicted between managerial overconfidence and debt maturity. This means overconfident managers are believed to choose more short-term debt in the capital structure than longer-term debt. The results found from all constructed models demonstrate that they are very strong and confident. In fact, the findings are different from all previous statements stating that overconfident managers tend to be more aggressive and might lead to riskier management outcomes (Adam et al., 2015). The riskier and bad outcomes can be mentioned, such as decreasing the success of the projects (March and Shapira,1987; and Langer, 1975), increasing in the cost of external financing and reducing the positive NPV of projects (Heaton, 2002), raising the sensitivity of investment projects' return (Huang et al., 2011), using more internal financing sources than debt and more debt than equity (Malmendier et al., 2007 and Lin et al., 2008, Ahmed and Malmendier et al., 2011), using a tight dividend policy (Deshmukh et al., 2013), using an aggressive capital policy (Huang et al., 2016), producing more wrong predictions and having a narrower range of predictions (Hribar and Yang, 2016), raising the volatility in returns (Hirshleifer et al., 2012), or making more acquisitions and issuing more debt (Huang and Kisgen, 2013).

In fact, the regression results may reflect a different prediction compared to conventional thinking based on previous research results. However, it might be that in the Vietnamese context, the regression results become different. Furthermore, based on the answers of interviewees, we see that 100% of respondents agreed with the statement that debt maturity has a significant impact on firm performance and, therefore, are careful when making decisions related to this aspect. Moreover, 93% of interviewees decided that debt maturity should follow the asset or investment project maturity. Thus, it can be stated that even though the managers are believed to be overconfident, this does not mean that they tend to hold more short-term debt than non-overconfident managers. In order to further explain this result, we can state that the different finding might also come from the nature of the capital market in Vietnam. As mentioned above, it is not easy for Vietnamese firms to access the bond market, and once they can access the bond market, mostly they can access short-term sources. Therefore, if they only have a chance to use a short-term bond, they might prefer using long-term bank debt to avoid the transaction costs or the complex procedures from bank borrowings.

In terms of other managerial attribute variables, only manager's age is illustrated to positively impact on debt maturity for all models for both the sub-sample size and extended sample size. This means that older managers tend to prefer longer-term debt over short-term debt. This result is consistent with our expectation that younger managers tend to be more overconfident and can show a risk preference compared to older managers and then tend to use more short-term debt and vice versa. Meanwhile, there is no evidence suggesting a significant relationship between the variables of duality, gender, and manager's education with debt maturity, which is different from predictions.

Regarding other control variables, a positive relationship is found between ownership concentration and debt maturity, which is consistent with most previous studies such as Marchica (2008) and Arslan and Karan (2006). For foreign ownership, the result shows that a higher level of foreign ownership, firms tend to hold more longer-term debt, this finding is also the same as expectations. In terms of state ownership, compared to the conclusion in the research of Li et al. (2009), the result of a positive impact on debt maturity in this study is found to be similar. Also consistent with matching theory and almost all previous studies (such as Stohs and Mauer, 1996, Myers, 1977, Mitchell, 1991, Ozkan, 2000, Díaz-Díaz et al., 2016), asset maturity is confirmed as positively impacting on debt maturity. The finding

in terms of leverage also indicates a positive significant impact on debt maturity, which is similar to the studies of Awartani et al. (2015). For the intangible assets variable, the empirical results also show that the more intangible assets in firms, the greater the use of longer-term debt, as per the expectation. One last variable is considered to be consistent with the expectation is profitability, which is illustrated as having a negative impact on debt maturity.

In contrast, among all the control variables, liquidity, dividend and firm age are found to be showing different results compared to previous studies. Accordingly, liquidity is predicted to positively affect debt maturity, which is contrary to the conclusions in the research of Johnson (2003), Diamond (1991) and Datta et al. (2005). In terms of dividend, it should be expected to have a positive effect on debt maturity; however, the result shows a difference to the prediction. Finally, for the variable of firm age, Scherr and Hulburt (2001), Custódio et al. (2013) state that older firms tend to use more long-term debt than younger firms. However, in the Vietnamese context, the empirical result indicates an opposite relationship. This result is also different from the finding from Magri (2010), as this scholar found an inverted U-shape in relation to debt maturity. Further research might focus more on firm age and debt maturity in the Vietnamese context to produce a better estimation.

In terms of the second hypothesis, very interestingly, it shows a positive relationship between debt maturity and managerial overconfidence. That means that more overconfident managers tend to have a higher deviation between the actual debt maturity level and the targeted debt maturity level. This finding is consistent with the hypothesis constructed. The findings are similar in both sub-sample size and extended sample size. To explain this finding, it can be seen that it might be due to a greater focus on longer-term debt; hence, it is easy to fail in determining the best level for debt maturity, thus leading to a high deviation between the actual debt maturity and the optimal debt maturity. Besides that, there is a small evidence suggests that male managers tend to make a lower deviation between actual level of debt maturity and optimal level of debt maturity than female managers. This finding is also very interesting when normally female managers are believed to be more cautious than male managers. However, there is only one model in sub-sample size indicates this result, therefore, it is not a strong result. Duality is also found having a negative relationship with the deviation, but there is also one model supports for this relationship. Regarding manager's age, when in sub-sample size, it is found that there

is no relationship between this variable and the deviation, however, in extended sample size, it is indicated that manager's age strongly affects the deviation with positive signs. In term of other control variables, there are several evidences show that ownership concentration, state ownership, dividend, leverage, profitability, intangible assets, and firm age have significant associations with deviation, but those associations are also not very strong. In which, the significant relationship between the deviation and ownership concentration, state ownership, liquidity, asset maturity, leverage and firm age are also strongly confirmed in the extended sample size.

In terms of the endogeneity test with the use of the GMM estimation, the results from all significant models are similar to the results of the GLS from cross-sectional models and the GLS and FE estimations from panel models. In panel models, the finding is quite appropriate as there is only small evidence, with only a 10% significance in GLS and FE, showing the significance between those two variables. That means most of them are significant at 1% level. In the models of financially constrained firms and financially unconstrained firms, it is shown that there is only a difference between constrained and unconstrained firms in terms of dividend and intangible assets. Accordingly, the dividend is only significant for unconstrained firms and intangible assets are only significant with constrained firms.

3.5. Conclusion

Debt maturity is explained as playing a very important role in corporate management. Therefore, the investigation of the determinants of debt maturity has been increasing recently. Throughout the examination of a number of papers discussing the determinants of debt maturity and also new factors that might affect aspects of corporate management, it is found that managerial overconfidence is seen as a new factor that might have a significant impact on debt maturity.

Managerial overconfidence in this research is measured by two different proxies that make the study very different compared to previous studies. More specifically, the first proxy is voice pitch, which is used here for the first time to measure managerial overconfidence. To avoid a bias in the regression results, the study also drew on one previous study that used CEO photographs appearing in annual reports to test again all the regression results from the first proxy. Actually, the two different proxies of managerial overconfidence offer two

different research subjects, namely different top-line managers and only CEOs. This means that the regression results become stronger and more confident.

After running the regression, the findings indicate that overconfident managers tend to hold more longer-term debt than short-term debt and but tend to have a higher deviation between the actual debt maturity and the targeted debt maturity. It seems to be very interesting when the first finding is different from the prediction and other prior studies. When we predict that overconfident managers is highly associated with issuing more short-term debt than long-term debt. However, in the context of Vietnam, overconfident managers seem to prefer using more long-term debt, or just because they are following the matching principle of debt maturity. Another reason explaining for the result comes from the characteristics of financial system of Vietnam, when firms mostly depend on bank sources to finance for their debts. Hence, once they can access to the funds, they might prefer using long-term debt than short-term debt. And might be due to the preference of using more long-term debt in the capital structure, overconfident managers tend to make a higher bias between the target level of debt maturity and the actual level of debt maturity. Actually, the finding of overconfident managers tend to make higher deviation between the optimal level of debt maturity and the actual level of debt maturity is consistent with the prediction and also consistent with the nature of managerial overconfidence.

Besides the findings for the two main research hypotheses of this chapter, it is also found that manager's age has a positively significant impact on debt maturity. By contrast, duality, gender, and manager's education are indicated with no evidence that having the relationship with debt maturity. In term of other control variables, ownership concentration, foreign ownership, state ownership, asset maturity, leverage, intangible assets, and liquidity are showed having positive relationships with debt maturity. Those findings are also confirmed in GMM models except for the variable of intangible assets. On the other hand, profitability, dividend, and firm age are illustrated having negative effects on debt maturity in almost all empirical models.

Taking everything into account, we believe that our findings contribute significantly to the research bank and also the practice corporate management. For practical arena, it suggests that the decision of debt maturity choice might be affected by the overconfident managers, however, it is also impacted by the characteristics of the country-level financial market. For example, in Vietnam, the corporate bond market has not been developed sufficiently, the

main source of finance still come from bank source. Therefore, the initiative of finance sources might not belong to firms. Hence, it affects a lot the choices of debt maturity. However, we also find that overconfident managers tend to make higher deviation between targeted debt maturity and actual debt maturity. Therefore, firms with overconfident managers should be more careful in determining decisions related to debt maturity choices.

CHAPTER 4: MANAGERIAL OVERCONFIDENCE AND FIRM PERFORMANCE: EVIDENCE FROM VIETNAM

ABSTRACT

Managerial overconfidence plays an important role in firm value. It is believed that the greater the overconfidence level of managers, the greater the probability of loss in firm value. However, the empirical evidence from this study indicates a very interesting result whereby managerial overconfidence is shown to have a positive impact on firm value. The result is illustrated through empirical research from a sample size of 648 listed firms on the Vietnamese stock exchange market.

4.1. Introduction

Firm performance or firm value is one of the most important topics being debated in the financial and business literature and attracts many scholars in the research field as well as managers and investors in reality. Also, for any firm, the most important goal is normally maximizing firm value, which reflects the firm's market share maximization or is also understood as maximizing shareholder wealth (Fama, 1978, Wright and Ferris, 1997, Walker 2000, and Qureshi, 2006). This most important goal can be achieved by efficiently implementing the financial management system and also through the making of cautious and precise decisions by managers (Jensen and Smith, 1994, Fama and French, 1998). Hence, it can be seen that managers are key persons who play an important role in affecting the performance of businesses. Thus, managerial attributes can be considered as an interesting and practical aspect when examining the determinants of firm value or firm performance. For those reasons, this study attempts to focus on investigating the relationship between one of the most remarkable characteristics of managers – managerial overconfidence – and firm value. According to Lin et al. (2005), there are some reasons that can be used to explain why managers tend to be more confident. Firstly, managers are believed to be optimistic because they are the controllers of firms (March and Sharpia, 1987, Weinstein, 1980). Secondly, when they are committed, they are prone to being confident (Weinstein, 1980). Normally, overconfident people tend to overstate their skills and this leads to certain effects on corporate performance in general. For example, according to DeAngelo et al. (1996), optimistic managers tend to pay more dividends or choose more debt in capital structure and also follow pecking order theory (Hackbarth, 2002). With their decisions, overconfident managers might cause the problem of failure in investing (March and Shapira, 1987, and Langer, 1975) or a decrease in the NPV index of projects (Heaton, 2002) due to them underestimating the risks of projects and overestimating the successful probability of projects (Malmendier and Tale, 2005). According to Adam et al. (2015), overconfident managers may make a number of wrong decisions during their managerial lives, and hence have negative effects on firms.

Managerial overconfidence is mentioned widely in many recent studies in various areas, especially in the psychometric field. In the financial field, it is also studied in several areas, such as examining its impact on investment projects (March and Shapira, 1987, Langer, 1975, Hirshleifer et al., 2012, and Ahmed and Malmendier et al., 2013, Heaton, 2002),

capital structure and cash holdings (Malmendier et al., 2008, Lin et al., 2008, Huang-Meier et al., 2016), acquisitions (Graham et al., 2013), and dividend policy (Deshmukh et al., 2013). Of course, all of those aspects are important management decisions which certainly affect firm performance. However, there has been no study investigating the direct influence of managerial overconfidence on firm value. Therefore, this research aims to fill this gap by examining the relationship between managerial overconfidence and firm value. Furthermore, it can be stated that overconfident managers play an important role in determining the firm value when they affect all or most of the business decisions. Therefore, this research seeks the answer to the question of what the effect of overconfident managers is on firm value by implementing the research in Vietnam context – a developing country in Southeast Asia – one of the countries not mentioned in their researches so far. Vietnam can be seen as a new market to conduct the research, meaning we can examine and compare the empirical results with previous studies.

In this study, firm value and firm performance are seen as non-different terms that have the same meaning. Regarding the theories of firm performance, we based ourselves on the economic model and the organizational model of firm performance in conducting the study. Firstly, analysing the economic model, industrial organization economics is illustrated to be extremely useful to examine the impact of market structure on firm performance. In fact, there is a wide range of specific models explaining the factors affecting on firm performance, such as the characteristics of a firm's industry, the firm's position compared to firm's rivals, and the quality and quantity of the firm's resources (Scherer, 1980 and Porter, 1989). In terms of industry variables, Bain (1956), Ravenscraft (1983), and Schmalensee (1985) state that there is a significant impact of industry return on firm performance. Moreover, it is also demonstrated that different industries might indicate different impacts on firm performance. Besides the impact of the industry, firm performance is also affected by the competitors through competing for market share, market power and other competitive advantages (Shepherd, 1972, Karnani, 1984). In terms of firm-level variables, a number of factors have been identified in previous studies such as board composition (Hermalin and Weisbach, 1991), manager ownership (Mace, 1971, Vancil, 1987), CEO duality (Bhagat and Bolton, 2008, Berardino, 2016), board effectiveness (Conheady et al., 2014), investment opportunities, payout ratio (Giriati, 2016), debt structure, and corporate control activity (Agrawal and Knoeber, 1996).

According to organizational model of firm performance, a variety of aspects examined to determine their effect on the firm performance, such as the satisfaction level of employees and shareholder wealth (Cameron, 1986, Goodman and Pennings, 1977, and Steers, 1975), the behaviours of managers regarding psychological, sociological and physical interactions (Hansen and Wernerfelt, 1989), and organizational climate including structure, motivation, group dynamics, job enrichment, decision-making, leadership, target, and planning (Hansen and Wernerfelt, 1989, Pritchard and Karasick, 1973, Litwin and Stringer, 1968).

Throughout a number of empirical studies, the determinants of firm value have been found, including the board composition, focusing on examining the role of inside managers and outside managers (Hermalin and Weisbach, 1991, Weisbach, 1988, Brickley et al., 1991, Shivdasami, 1991,), aspects of corporate governance (Core et al., 1999, Bolton, 2008, Mehran, 1995, Huson el al., 2003, Zang and Gao, 2015 and Wang and Chen, 2016), manager's characteristics such as CEO duality (Yang and Zhao, 2014, Berardino, 2016), managerial ownership (Himmelberg et al., 1999, Mace, 1971, and Vancil, 1987), manager's gender (Liu et al., 2013), manager's age and education (Mohamed et al., 2015), the ownership structure including ownership concentration (Lozano et al., 2015), Saona and Martin, 2016), institutional ownership (Pirzada et al., 2015), family ownership (Dyer, 2006), R&D cooperation (Belderbos et al., 2004), corporate social responsibility (CSR) (Crifo et al., 2014, Saeidi et al, 2014, Badriyah et al., 2015), organizational culture, market orientation and innovativeness (Deshpande and Farley, 2004), the effectiveness of information systems resources (Ravichandran et al, 2005), new product introduction (Vermeulen et al., 2005), political connections (Li et al., 2008, Tang et al., 2016), the industry-academy linkages (Eom and Lee, 2010), intellectual capital, innovation and organizational strategy (Kalkan et al., 2014), the incidence of accident in the workplace (Argiles-Bosch et al., 2014), environmental collaboration with suppliers and customers (Grekova et al., 2014), innovation efficiency and global diversification (Gao and Chou, 2014), innovation strategy (Karabulut, 2015, Serra and Ferreira, 2010, Zehir et al., 2015), market competition and human resource management (Kaufman, 2015), knowledge management capabilities (Cohen and Olsen, 2014), social media in restaurant companies (Kim et al., 2015), environmental investment (Bostian et al., 2016), social ratings (Cellier and Chollet, 2016), entrepreneurial orientation and capability-based HRM (Edgar and O'Kane, 2015), etc.

Generally, firm performance is determined by a wide range of factors ranging from micro to macro elements. According to the organizational model of firm performance, the role of the manager is also a key determinant of firm value. Furthermore, throughout a number of empirical studies, it has been found that the manager's characteristics have significant impacts on firm performance. Hence, this study attempts to seek the relationship between managerial overconfidence and firm value.

Overconfidence is defined as people who tend to misjudge their abilities, skills, knowledge, produce more wrong predictions than non-overconfident people, and are always confident that they are better than the average (Deaves, 2010, Larwood and Whittaker, 1977, Svenson, 1981, and Alicke, 1985). Overconfident people are believed to lack learning experience from prior failures (Gervais and Odean, 2001, Miller and Ross, 1975, Weinstein, 1980). Regarding the specific term of managerial overconfidence, Miller and Ross (1975) indicate that overconfident managers tend to make less cautious decisions or overestimate the future earnings of investments or future firm performance's results (Hackbarth, 2009) and underestimate the firm risks (Heaton, 2002). Thus, it can be seen that managerial overconfidence can be a potential risk for firms whereby empirical evidence illustrates that overconfident managers tend to make overconfident decisions, hence cause unexpected outcomes for firms, and finally can negatively affect the value of the firm.

In terms of managerial overconfidence measurement, there have been a number of different measurements of this term, such as using upwardly biased forecasts (Lin et al., 2005, Huang et al., 2011), options holdings (Lambert et al., 1991, Meulbroek, 2001, Hall and Murphy, 2000, 2002, Malmendier and Tate, 2015), executive's relative salary (Malmendier and Tate, 2015), media coverage (Brown and Sarma, 2007), psychometric testing (Scheier et al., 1994, Graham et al., 2013), the visibility of CEO's photographs in annual reports (Schrand and Zechman, 2012) and manager's gender (Yang and Zhu, 2016, Mishra and Metilda, 2015, Huang and Kisgen, 2013). This study differently uses a very new measure, using voice pitch analysis to measure the overconfidence level of managers, which follows the suggestions from the studies of Feldman et al. (2010) and Mayew and Venkatachalam (2012). Besides, some of the previous proxies used to measure overconfidence also are used to strengthen the results from the new measurement, including the gender of managers and the scale of managers' photos' visibility on annual reports (stemming from the

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researches of Yang and Zhu (2016), Mishra and Metilda (2015), and Huang and Kisgen (2013) and Schrand and Zechman (2012)). From the three different proxies of managerial overconfidence, also two different types of research objects are studied, namely top-line managers from interviews as well as CEOs by collecting data of managers' gender and from the visibility of photos in annual reports. The use of two different types of research objects might help to minimize bias in the estimation results.

In this study, data from a total of 648 non-financial listed firms are collected, whereby data on voice pitch are collected from 123 direct interviews with Vietnamese listed firms' top managers, while the data of managers' gender and photos' scale are collected from annual reports of all 648 firms. All of the results are expected to support each other and produce confident results in this research. The proxies used to represent firm performance in this research are Tobin Q and market to book value.

The main purpose of this study is to find out the impact of managerial overconfidence on firm performance. Furthermore, the study also attempts to investigate the effect of cash holdings and debt maturity on firm performance. Finally, by using the same proxies for cash holdings and debt maturity from chapter 2 and chapter 3 and linking with the empirical results from chapter 2 and chapter 3, the study seeks to investigate the indirect relationship between managerial overconfidence and firm value by analysing the effect of managerial overconfidence on cash holdings and debt maturity and then from cash holdings and debt maturity on firm performance. With this aim, we construct the research questions as follows.

Research questions

1. *What is the impact of managerial overconfidence on firm performance?*
2. *What is the effect of cash holdings on firm performance?*
3. *Is there any relationship between debt maturity and firm performance?*

This study contributes to both the theoretical and practical arena whereby it introduces the new measurement of managerial overconfidence and then examines the impact of overconfident managers on firm value. The use of two different research objects, namely top-line managers and CEOs, and two different data types, namely a small sample size and an extended sample size to avoid bias in the regression results, is also another significant contribution. The next contribution can be the finding from examining the effect of cash holdings and debt maturity on firm performance. In addition, the result from investigating

the indirect impact of managerial overconfidence on firm value through examining its impact on cash holdings and debt maturity is a further contribution. Moreover, Vietnam is a developing country with different political and economic benchmarks compared to others, especially developed nations, thus interesting empirical results are expected.

This chapter is structured as follows. The following section is the literature review with an overview of the relevant studies in the field of overconfident managers and firm value. The next section is the research methodology and the description of the data collection. After that, the empirical results with the findings are represented. Following the findings part is the discussion with analysis, comparing and contrasting the findings to the previous studies in the literature review. The final section is the conclusion and recommendations.

4.2. Literature review

4.2.1. Overconfidence: theory, empirical and measurement

4.2.1.1. Definition of overconfidence

Overconfidence is seen as an abstract concept and there have been a number of definitions mentioned through various previous studies, especially in the psychology area. Among those definitions, some are often used as the term describing people who may misjudge their abilities and skills, overestimate future forecasts and always think they are better than average (Deaves, 2010, Larwood and Whittaker, 1977, Svenson, 1981, and Alicke, 1985). Further, overconfidence can also be mentioned as excessive optimism and self-attribution bias, and even making the same mistakes despite previous failures (Gervais and Odean, 2001, Miller and Ross, 1975, Weinstein, 1980). Due to those characteristics of overconfidence, it is stated that overconfident people may experience negative effects in their lives; in particular, if they are managers, they may affect the life of firms through their management decisions (Camerer and Lovallo, 1999). For example, Miller and Ross (1975) illustrate that overconfident managers may be too confident about their predictions for future firm performance, and therefore lack caution in thee process of decision-making and thus might lead to unexpected results.

In order to define overconfidence, several terms are listed, such as miscalibration, the better-than-average effect and the illusion of control (Fischhoff et al., 1997, Taylor and Brown, 1988, Langer, 1975). Fischhoff et al. (1977) noted that overconfident people tend to answer over-confidently all moderate and very difficult questions in their experiment, and then they defined them as miscalibration. Or, in the management context, Ben-David et al.

(2013) identify overconfident CEOs as those returning confident answers to a number question on their predictions for the future stock market. Regarding another term used to describe overconfidence, better than average is used by Taylor and Brown (1988) and Svenson (1981) to refer to people who always evaluate themselves as being better than others on average. In terms of the illusion of control, overconfident people are described as persons who are normally too confident about the outcomes of events, even they know these are uncontrollable (Langer, 1975).

Sometimes, overconfidence is described similarly as the term of optimism (Gervais, 2010). And many scholars explain optimism as the same as overconfidence, such as Heaton (2002), who states that optimistic managers tend to overestimate firm performance and underestimate unexpected risks. Meanwhile, Hackbarth (2009) states that optimistic persons may over-predict the growth rate of returns and the growth rate of assets or the positive value of assets and investment opportunities (Baker and Wurgler, 2012). Because the terms overconfidence and optimism are described quite similarly among studies, those two terms are also considered as one and are mentioned as an alternative to each other throughout the research.

4.2.1.2. The effect of managerial overconfidence on corporate financial behaviours

The previous section attempts to explain the definition of overconfidence to show that overconfident managers might lead to worse results in firm performance compared to other peers. This section is based on a number of the previous literature to find out the effect of managerial overconfidence on corporate operations and then examine whether or not this might affect firm value.

According to March and Shapira (1987) and Langer (1975), investment projects may be underestimated by overconfident managers and then have unexpected outcomes. The research of Heaton (2002) indicates clearly that in firms with overconfident managers, it is easy to have a decline in positive NPV projects. Also, it is stressed that more investment opportunities might be estimated as being overvalued (this conclusion is also found from the papers of Malmendier and Tate, 2005, and Ahmed and Malmendier et al., 2013) due to the overconfidence affecting the increase in the sensitivity of free cash flow and also the increase in the cost of using external capital (Heaton, 2002). Regarding sources of capital, Ahmed and Malmendier et al. (2013) find that overconfident managers seem to prefer less equity and external sources than others. This statement is also illustrated in the previous

study of Malmendier and Tate (2005), whereby they believe that overconfident managers see external finance as an undue cost and prefer to use internal finance (Malmendier et al., 2008 and Lin et al., 2008). In the study of Graham et al. (2013), they find that overconfident managers seek short-term debt in their capital structure. Besides, overconfident managers also tend to hold less cash (Huang-Meier et al., 2016), conduct more share repurchases because they believe the market undervalues their stocks (Shu et al., 2013), use a tight dividend policy as they think the external finance is expensive and retained earnings are seen as a very good finance source (Deshmukh et al., 2013). Many scholars demonstrate that overconfident managers can cause more risk to firms or even lose control of firms since they are too optimistic about the future of firms and then make more wrong forecasts and decisions (Adam et al., 2015, Hribar and Yang, 2015).

To sum up the effect of overconfident managers on corporate behaviours, there is no doubt that a firm can be negatively impacted if the managers are optimistic. Since overconfident managers may make overconfident decisions, which can lead to wrong decisions and then finally decrease the value of the firm. However, it can be seen that many previous studies just examined the impact of managerial overconfidence on the side aspects of corporate management, such as capital structure, investments, and dividends, but not the firm value. Therefore, this study attempts to investigate the direct relationship between overconfident managers and firm value in the context of Vietnam. The hypothesis is constructed as follows.

H4.1: Managerial overconfidence has a negative impact on firm value

4.2.2. Theories of firm performance

There are two main types of theories used in this study to explain the determinants of firm performance, namely the economic model of firm performance and the organizational model of firm performance. In terms of the economic model, market structure is examined to have significant impacts on firm performance, in which some of the main factors are listed, such as the characteristics of a firm's industry, the position of a firm compared to its rivals and the quality and quantity of a firm's resources (Hansen and Wernerfelt, 1989). For industry variables, the different industries are explained as having different impacts on firm value (Schmalensee, 1985). Further, the average profit of a firm's industry is also proved to have a significant relationship with firm performance. In terms of a firm's competitors, severe competition in the market regarding the market share, the source of market power,

and the relative competitive advantages are believed to have remarkable impacts on firm performance (Shepherd, 1972, Karnani, 1984). In firm-level variables, all relevant firm level aspects are believed to affect the performance of firms (Hansen and Wernerfelt, 1989).
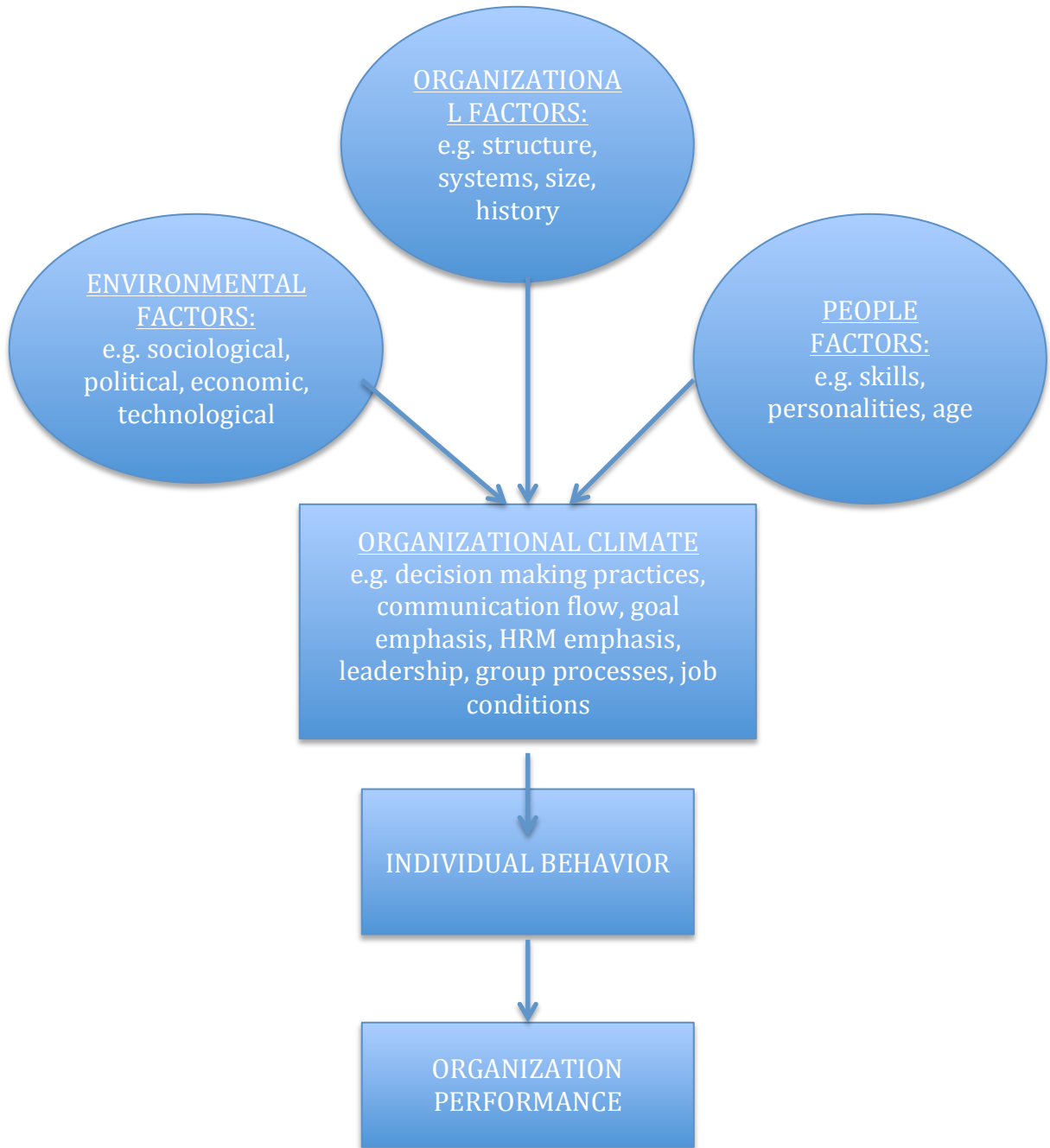
Figure 4.1: The organizational model of firm performance
(Hansen and Wernerfelt, 1989)

For the second theory, the organizational model of firm performance indicates that there are a variety of factors affecting firm performance. They are classified into three main groups of factors.

First is the group of organizational factors, such as structure, systems, size and history. Second are the factors from the environment, including sociological factors, political factors, economic elements and technological development. The third group is people factors, which examine some aspects such as skills, personalities and age. For those three main groups, it is believed that all of them have certain influences on the organizational climate, including the decision-making process, communication flow, targets, human resource management, leadership, group processes and job condition, and thus affect the individual behaviour and finally impact on firm performance (Hansen and Wernerfelt, 1989) (see figure 4.1).

4.2.3. The determinants of firm performance

Throughout a review of the empirical literature regarding the determinants of firm performance or firm value, it can be seen that there have been many different factors that affect firm performance. However, as the purpose of this study is just to mainly concentrate on the financial field, this research does not mention factors that might be irrelevant to financial analysis. However, some of them are still mentioned briefly as a part of the reference.

Firstly, one of the factors, which is often discussed in many prior studies, is the board of management. In fact, there have been a number of researchers who believe that the board composition plays a very important role in determining firm performance, whereby outside managers have a more important role in controlling the firms (Weisbach, 1988, Brickley et al., 1991, Shivdasami, 1991, Agrawal and Knoeber, 1996). But in contrast, the papers of Mace (1971) and Vancil (1987) suggest that inside managers enhance the firm's success. On the other hand, Hermalin and Weisbach (1991), in a study based on 142 NYSE firms, found that inside or outside directors are indifferent to showing stockholders' interests, but there is no relationship between board composition and firm performance. Besides the board composition, a smaller board of directors is also believed to lead to a better market valuation of the firms, according to the research of Yermack (1996). In another study, Conheady et al. (2014) indicate that there is a positive relationship between board effectiveness and firm performance. According to these authors, an effective board of

directors is at the centre of agency theory, which is minimizing agency cost and protecting owners' interest and hence significantly affecting firm performance. In terms of board independence, Liu et al. (2014) find a positive relationship between board independence and firm performance in China. In particular, the relationship becomes stronger for government-controlled firms and firms with lower information acquisition costs. Similarly, Najjar (2014) also finds that board independence will help to enhance the firm and stock value. Moreover, Najjar (2014) also indicates mixed results in that board size reveals a positive relationship with firm profitability, while small boards represent more effective share performance. Same as the studies of Liu et al. (2014) and Najjar (2014, Fuzi et al. (2016) believe that independent directors are trustworthy for shareholders and can help to minimize the agency problem. However, by contrast, with different results in the research presented in the fifth international conference in marketing and retailing, Fuzi et al. (2016) indicate a mixed relationship between the proportions of independent managers and firm performance. Meanwhile, Zabri et al. (2016) show that board independence and firm performance are irrelevant to each other. The paper also shows that there is a negative relationship between board size and ROA (similar to the study of Eisenberg et al., 1998), but for ROE, the relationship is insignificant. Additionally, board size is illustrated to negatively impact on firm performance as measured by Tobin Q in the study of Duru et al. (2013). In other aspects, the board meeting is considered in the context of firm performance by Vafeas (1999). Accordingly, the author concludes that board-meeting frequency has a significant impact on firm value. Specifically, it is inverse with firm performance.

In terms of ownership structure, there is a wide range of studies examining the impact of managerial ownership on firm performance. For example, Mace (1971) and Vancil (1987) state that the increase in managerial ownership will have a positive impact on the firm performance in cases where the percentage of ownership is less than 1%. In contrast, the firm's performance will be decreased with the increase of ownership if it goes beyond the 1% level. However, with a different finding when discussing the ownership structure of a firm, Himmelberg et al. (1999) state that a change in managerial ownership is irrelevant to the firm performance. Based on the research of Himmelberg et al. (1999), Zhou (2001) developed and found that "with rational managers maximizing long-term utility, small, one-year changes in ownership are not likely to reflect notable changes in incentives that would

lead to substantive within-year changes in performance". Besides managerial ownership, family ownership is also considered as an important factor affecting firm performance, as per the finding in the study of Dyer (2006). In his study, Dyer (2006) suggests that family ownership has a significant effect on firm value based on the theory of agency problems. Muttankin et al. (2015) also indicate that family firms normally perform better than non-family firms. This conclusion is also the same as the previous study of Anderson and Reeb (2003). The paper of Muttankin et al. (2015) represents further findings suggesting that politically connected family companies outperform those that are not politically connected. By contrast, Poutziouris et al. (2014) stress that there is no association between family ownership and firm performance in their research on UK companies. In another aspect related to institutional ownership, when investigating firm performance in Malaysia, Pirzada et al. (2015) used ROA, ROE, PE, EPS and the ratio of long term debt to capital as proxies for firm performance and found that the relationship between a firm's performance measured by EPS and PE ratio and institutional ownership is significant. Meanwhile, the result is insignificant if the performance is measured by long-term debt to capital ratio, ROA and ROE. Regarding ownership concentration, Saona and Martin (2016) prove that changes in ownership concentration can help to forecast a change in firm performance. Also studying about ownership concentration, Lozano et al. (2015) find that the relationship between ownership concentration and firm performance has a U-shaped form. On the other hand, Vintila and Gherghina (2014) indicate that ownership concentration from the three largest shareholders has a positive impact on firm value.

Besides ownership structure, in other aspects of corporate governance, Core et al. (1999) illustrate that weaker governance structures might lead to higher agency problems and therefore higher compensation for CEOs and thus lead to a worse result in performance. Similarly, Bhagat and Bolton (2008) demonstrate that better governance, indices, and board ownership have a positive association with firm performance. Regarding managers' compensation, Mehran (1995), Zang and Gao (2015) and Wang and Chen (2016) also find a positive relationship between directors' compensation and firm performance. In another aspect, Huson et al. (2003) find that CEO turnover has a positive relationship with firm performance. Or, in the study of Saona and Martin (2016), the protection of investors' rights and their legal status in a firm will significantly affect the firm value.

Regarding managerial attributes such as CEO duality, manager's gender, age, education

and tenure, there have been a number of papers mentioning the significant relationship between managerial attributes and firm performance. For example, by using the 1989 Canada-United Free Trade Agreement, Yang and Zhao (2014) state that firms with CEO duality normally tend to outperform firms with non-duality CEOs, especially during a change of the competitive environment. This conclusion is similar to the finding in the study of Bolton (2008), as he also finds that the relationship between CEO duality and firm performance is significantly positive. On the other hand, with different findings, Berardino (2016) indicates that CEO duality and boards with academic researchers have no significant relationship with firm performance. In terms of the manager's gender, it is found that the gender of the board of management is a significant factor that is considered in examining firm performance. According to Liu et al. (2013), a diversification in board gender plays a positive role in firm performance. Furthermore, these authors state that female CEOs have significant impacts on firm performance in legal person-controlled firms but not in state-controlled firms. Similarly, Perryman et al. (2015) find that firms with higher gender diversity in the top management teams represent a lower risk and have better firm value. Besides gender, other CEO characteristics are also considered in investigating firm performance, such as in the paper of Mohamed et al. (2015). In this research, several attributes of CEOs such as age, education background and tenure are examined. Accordingly, manager's age and education level might decrease the shortfall and so enhance the firm's value, while a long tenure of managers might decrease the firm value.

At the firm-level variables, there are many factors demonstrating a significant impact on firm performance, such as free cash flow, dividend payout ratio, investment opportunities (Giriati, 2016), changes in productivity, changes in employment, climate, quit rate and absenteeism rate (Addison and Belfield, 2001), insider shareholdings, debt, and corporate control activity (Agrawal and Knoeber, 1996), and research and development (Belderbos et al., 2004). In more detail, Giriati (2016) examines the relationship between a firm's value and other aspects such as the impact of free cash flow, payout ratio and investment opportunities set and opportunistic behaviour of managers. The findings of the research indicate that investment opportunities set, payout ratio and opportunities behaviour manager have a significant impact on the firm's value. In terms of the workplace environment, Addison and Belfield (2001), based on the data from the 1998 Workplace Employee Relations Survey, examined what factors affect the performance of a firm and

find some variables that affect the firm's performance, including change in productivity, change in employment, climate, quit rate and absenteeism rate. In another approach, Lang et al. (1995) investigate that when a firm finances funds through selling assets to get the cheapest fund, it might have high leverage and poor performance. In addition, when examining the firm performance, Agrawal and Knoeber (1996) find four mechanisms to control agency problems between managers and shareholders that affect the firm performance namely insider shareholdings, debt, and corporate control activity. Regarding R&D, Belderbos et al. (2004) study the effect of R&D cooperation on firm performance by classifying several types of R&D cooperation, consisting of competitors, suppliers, customers, and universities, on the firm value. Finally, the study indicates that there is a heterogeneity in the rationales and purposes of R&D cooperation. In other aspects, Badriyah et al. (2015) find that there is a significant relationship between the existence of a Risk Management Committee and the performance of a firm, and firm performance could be improved through management accounting practices (Abraman et al., 2016).

Regarding other important corporate aspects at firm level, such as leverage (Erickson et al.,2005; Faleye, 2007; Konijn et al., 2011; Ammanna et al., 2011), firm size (Ammanna et al., 2011; Prmborg, 2004; Bae et al., 2011; Erickson et al., 2005; Mak and Kusnadi, 2005; Uyar and Kilic, 2012; Wu, 2011), liquidity (Ammanna et al., 2011), sales growth (Hiraki et al., 2003; Mak and Kusnadi, 2005), capital expenditure (Ammanna et al., 2011; Connelly et al., 2013; Faleye, 2007; Fauver and Houston, 2004; Konijn et al., 2011; Mak and Kusnadi, 2005; Prmborg, 2004), profitability (Prmborg, 2004; Faleye, 2007; Bae et al., 2011; Uyar and Kilic, 2012; Connelly et al., 2013; Ammanna et al., 2011), there have been many studies indicating a significant relationship between those variables and firm performance. For example, leverage is shown to have a significant positive impact on firm performance as measured by Tobin Q (Vintila and Gherghina, 2014; Mak and Kusnadi, 2005; Bae et al., 2011). However, it is also found to have a negative relationship with firm performance due to the riskiness of debt and debt overhang (Erickson et al., 2005; Faleye, 2007; Konijn et al., 2011). On the other hand, Ammanna et al. (2011) show that leverage has both positive and negative impacts on firm performance. Meanwhile, Wu (2011), Prambord (2004), Uyar and Kilic (2012), and Connelly et al. (2013) indicate that there is no relationship between these two variables. In terms of firm size measured by the logarithm of total assets, there is a controversial debate regarding the relationship between firm size and firm performance

whereby a lot of researchers found different results for this relationship. For example, in the studies of Ammanna et al. (2011), Prmborg (2004), Bae et al. (2011), and Erickson et al. (2005), it is indicated that when total assets increase, the performance of the firm is decreased. By contrast, Mark and Kusnadi (2005), Uyar and Kilic (2012), and Wu (2011) show that the relationship between these two variables is positive. But it is also found in several studies that there is no relationship between total assets and firm performance, such as in Faleye (2007) and Connelly et al. (2012). For firm size measured by sales growth, it is stated that the higher the expectations for sales growth, the more a firm has value (Kuzey et al., 2014). Therefore, a number of studies demonstrate a positive relationship between sales growth and firm performance, such as Mak and Kusnadi (2005), Hiraki et al. (2003), and Jiao (2010). However, some scholars also found an insignificant impact of sales growth on firm performance, such as Wu (2011) and Uyar and Kilic (2012). In terms of the variable of liquidity, Ammanna et al. (2011) show that liquidity, as measured by cash ratio, has a significantly positive impact on firm value. Meanwhile, Pramborg (2004) finds that there is no relationship between these two terms. In addition, in the paper of Li et al. (2017), liquidity as measured by cash and near cash divided by total assets is also demonstrated as having a positive effect on firm value. Regarding the impact of capital structure on firm performance, the findings from a study of Ebaid (2009) show that when using ROA to represent for firm performance, the impact of short-term debt on firm performance is negative, but when changed to ROE, the relationship is insignificant. Meanwhile, long-term debt is found to positively impact on firm performance when measured by Tobin Q in the study of Cheung et al. (2015). For the dividend variable, Jiao (2010) shows that when dividend increases, firm value measured by Tobin Q tends to decrease. Some other aspects such as firm age are found to have a negative relationship with firm performance (Vintila and Gherghina, 2014), and Bourne et al. (2003) stated that share price has a significant impact on firm performance.

Besides investigating the determinants of firm performance over a long period, some scholars focus on specific periods such as during a recession period to examine the factors affecting firm performance. For example, Volkov and Smith (2015) find that during a time of crisis, corporate diversification plays a very important role that helps to improve firm performance. Also researching the firm performance during the recession, Dah (2016) indicates that relative industry turnover and managerial entrenchment have opposite effects

on the firm value during a downturn period. Meanwhile, Fosu et al. (2016) state that during a recessionary period, information asymmetry adversely impacts firm value.

Recently, the term corporate social responsibility (CSR) has been widely discussed in many studies. In terms of examining the determinants of firm performance, CSR is also mentioned as a key factor impacting the performance of a firm. In particular, by combining both quantitative and qualitative methods, Crifo et al. (2014) prove that CSR plays an important role in enhancing firm value. Each dimension in CSR will contribute differently to firm performance. Having the same research area, Saeidi et al. (2014) conclude that the relationship between CSR and firm performance is a fully mediated association. Ding et al. (2016) show that firms with different relative CSR to others might have better firm performance.

In fact, besides all the factors mentioned above, there are also many other factors illustrated as affecting firm performance. Those can be learning orientation and firm innovation capability (Calantone et al., 2002), the joint effects of a customer and learning-oriented organizational value system (Yilmaz et al. (2004), organizational culture, market orientation and innovativeness (Deshpande and Farley, 2004), the effectiveness of information systems resources (Ravichandran et al, 2005), new product introduction (Vermeulen et al., 2005), political connections (Li et al., 2008, Tang et al., 2016), industry-academy linkages (Eom and Lee, 2010), intellectual capital, innovation and organizational strategy (Kalkan et al., 2014), the incidence of accidents in the workplace (Argiles-Bosch et al., 2014), environmental collaboration with suppliers and customers (Grekova et al., 2014), innovation efficiency and global diversification (Gao and Chou, 2014), innovation strategy (Karabulut, 2015, Serra and Ferreira, 2010, Zehir et al., 2015), market competition and human resource management (Kaufman, 2015), knowledge management capabilities (Cohen and Olsen, 2014), social media in restaurant companies (Kim et al., 2015), environmental investment (Bostian et al., 2016), social ratings (Cellier and Chollet, 2016), technology-driven strategy (2016), and entrepreneurial orientation and capability-based HRM (Edgar and O'Kane, 2015).

Following the second and the third research questions of the study focusing on investigating the impact of cash holdings and debt maturity on firm performance, and based on a review of the literature, we predict that both cash holdings and debt maturity have a significantly positive relationship with firm performance. The hypotheses are as follows:

H4.2: Cash holdings have a positive effect on firm performance

H4.3: Debt maturity has a positive impact on firm performance

4.3. Methodology

4.3.1. Research design

4.3.1.1. Sample selection and data sources

The study is conducted on Vietnamese listed firms on the stock exchange market that have enough conditions for necessary and trusted data. Among a total of 648 listed firms (the latest update was at the end of 2016) on the Vietnamese stock exchange market, after reviewing all the necessary and available data, the total number of 648 firms is reduced, depending on the available data for each type of variable, which is shown in more detail in the section on the empirical results. Most importantly, 123 direct interviews with top managers are also conducted to record the voice of managers – one of the measurements of managerial overconfidence in this research, which is mentioned in the next part. Even though 123 direct interviews are conducted and collected, some data for the control variables are missing from the dataset, so the total number of the small sample size is also reduced when running the regression.

For the interviews, the questionnaires are designed with open-ended questions to ensure that the answers are long enough to analyse the voice. For the other data, some are collected from Thomson Reuters and the rest is collected from the firms' annual reports.

4.3.1.2. Data collection

There are three main parts in empirical research in this study that are equivalent to three different types of data. Firstly, the most important data is collected from the interviews, which are data from 123 direct interviews with top managers from 123 non-financial listed firms in Vietnam across the whole country. The interviews were conducted in two periods: the first one is from February to May 2017 with 79 interviews and the second period is from October 2017 to February 2018 with 44 interviews. As the dataset of firm value and the other control variables is from the end of 2016 for the first sub-sample size, all interviewees worked in their firms from at least 2016. Almost all interviews were conducted in the interviewees' workplace, about 20% of interviews were conducted during the annual conference for listed firms on the Hanoi Stock Exchange market held in early October 2017, and about 4% of the interviews were conducted at interviewees' home and cafes.

The process of getting approval from managers for the interviews was fulfilled as follows. All mails and phone calls were sent to managers of 424 listed firms to ask for the interviews. However, for the first period, only 79 managers accepted, and for the second period, there were only 44 managers willing to join the research. So, the total number of interviews collected is 123 top managers, but 5 managers among the 123 managers refused to record the interviews. Of the 123 top managers, there are 19 CEOs, in which 5 of them also hold the chairmen position, 81 CAOs/CFOs, whereby 4 are also vice executive directors, and 23 vice executive directors. In Vietnam, CAOs play the same role as CFOs, and almost all companies only have CAO but not CFO and vice versa. Hence, there is no difference in the roles of CFO and CAO in this research.

The total number of interviews from 123 managers is not a big number compared to many other studies; however, it still can be seen as a very good percentage for a study conducted in Vietnam as the total number of non-financial listed firms is only 648, thus the percentage calculated accounts for 18.98%. Regarding other data, besides the data of interviews in the first part of empirical research, all of them are collected from Thomson Reuters EIKON and annual reports.

For the second part of empirical research, all data of 648 firms are collected in 2016 with the data available from Thomson Reuters EIKON and annual reports. For the last empirical research part, data were also collected from all 648 firms but from an extended period of 2005 to 2016. These data were collected from Thomson Reuters EIKON and hand-collected from annual reports.

4.3.2. Measurement of manager's overconfidence

Overconfidence is mentioned widely among recent studies, especially in the corporate field. In fact, the term managerial overconfidence has become popular and a number of measurements for this term have been released. This section aims to overview the measurement of overconfidence and find the most appropriate measurement for the managerial overconfidence for this research.

The most popular measurement of managerial overconfidence is options holding (Malmendier and Tate, 2005, Chen and Ma, 2011, Hirshleifer et al., 2012, Ahmed and Duellman, 2013, Deshmukh et al., 2013, and Ting et al., 2016). Malmendier and Tate (2005) show that the more options are held, the greater the overconfidence level of CEOs. Accordingly, options are explained as the compensation for CEOs in firms and these are

not as easy to trade as other corporate shares. Therefore, holding more options may lead to more risks for CEOs. Malmendier and Tate (2005) also stress that CEOs who are risk-averse tend to hold options in the short term and trade them when they think the options' value is high enough (Lambert et al., 1991, Meulbroek, 2001, Hall and Murphy, 2000, 2002). For further explanation of options holding, in the research of Malmendier and Tate (2015), they mention again that options normally take a very long time to provide returns, and they can be called untradeable stock. Thus, for overconfident managers, the holding of options is not a problem because they believe in their value in the future when they can enhance firm performance. The use of options is popular in many studies, but it is not a perfect measurement that is appropriate in all cases. For example, in the study of Doukas and Petmezas (2007), they state that stock options are not suitable in the UK market and sometimes the holding of options may reflect that the managers are in the money of the options, but this does not mean that they are overconfident managers. Instead, the two scholars indicate that overconfident managers normally promote the chances of succeeding in contests.

Lin et al. (2005) believe that upwardly biased forecasts can be used to represent overconfident managers when they have more upwardly biased forecasts than downwardly biased forecasts during their management term. Having quite similar ideas of the ways to measure overconfident managers, Huang et al. (2011) suggest that bias in forecasted earnings and actual earnings can be a good measure for overconfident managers. They state that overconfident managers tend to make more over-forecasting than non-overconfident managers. Besides using biased forecasting to measure managerial overconfidence, Huang et al. (2011) suggest an alternative measurement for this term, namely the executive's relative salary. The use of the executive's relative salary for overconfident measurement can be explained by the illusion of control, whereby the managers have more power from the more executive's relative salary (Hayward and Hambrick, 1997, Sivanathan and Galinsky, 2007, Rudski, 2004).

One of the very good measurements of managerial overconfidence can be found in the research of Scheier et al. (1994) and Graham et al. (2013), which is the using of psychometric test. In these studies, overconfident managers are identified through a survey in which interviewees required to answer a number of psychometric questions. The questions in the survey of Graham et al. (2013) are related to risk-averse, time preference,

aversion to sure losses, and optimism, while the questions in the research of Scheier et al. (1994) are related to confident level.

Interestingly, a very new measurement of managerial overconfidence is found from the research of Schrand and Zechman (2012). Based on the visibility of the CEO's photograph in the firm's annual reports, the authors believe that the larger the visibility of the CEO's photograph in annual reports, the higher the level of overconfidence.

One more special measurement comes from the studies of Yang and Zhu (2016), Mishra and Metilda (2015), Huang and Kisgen (2013), in which the gender of managers is considered as an important factor determining the overconfidence of managers. Particularly, female managers are believed to be less confident than male managers. However, there is further research from Hardies, Breesch and Branson (2012) that shows that overconfidence cannot be identified through the gender of managers. However, most researchers agree with that measurement, so there is no doubt that the gender of the manager can be used as a measurement for overconfidence.

Besides several of the measurements of managerial overconfidence mentioned above, some other ways also used to measure this term can be mentioned, such as the press-based measure (Hirshleifer et al., 2012, Shu et al., 2013 and Hribar and Yang, 2016) and media coverage (Brown and Sarma, 2007).

Generally, a number of ways can be used to measure managerial overconfidence. However, most importantly, in order to find out the appropriate method and also a new method to measure overconfidence – one of the main purposes of this study – it is necessary to examine carefully the Vietnamese context. Among those measurements listed above, options can be seen as the most popular way, but in Vietnam, options are still very new and young and also not popular, so it is hard to use them to measure managerial overconfidence. For the executive's relative salary, press-based, and media coverage, in this case, the data are not available or not strong enough to use as a measurement of overconfidence. For the psychometric testing, the interviews also use a number of closed-ended psychometric questions with the purpose of measuring overconfidence; however, this seems not to be suitable for the small sample size of this research as it reveals insignificance in regression results. The same result happens with the measurement of using bias in earnings forecasts. Thus, psychometric testing and bias in earnings forecasts are considered as not appropriate methods to use in this research. After carefully examining all

the potential methods, we find four ways to measure managerial overconfidence, namely the visibility of CEO's photos in annual reports, the managers' gender, the third is a new one that this study wants to introduce and contribute to research and practice, namely voice pitch analysis, and finally, a comprehensive index is constructed from managers' gender, CEO's photos and voice pitch. The reason for using four methods is to avoid bias in the empirical results. If all measurements produce the same results, then the research becomes more reliable.

Regarding the new method of voice pitch, the idea of using this measurement stems from the studies of Hobson et al. (2012), Davis et al. (2012), Elkins et al. (2012), Feldman et al. (2010), Mayew and Venkatachalam (2012), Gamer et al. (2006). Accordingly, Hobson et al. (2012) in their research suggest that there is a negative relationship between vocal dissonance and financial misreporting. Davis et al. (2012) analyses the tone of voice in conference calls and states that the different tones decide the managers' style. Also, the human voice is believed to reflect the carrying of alerting and emotional messages (Elkins et al., 2012) and helps to detect guilty and innocent people (Gamer et al., 2006). The manager's tone of voice also indicates the strength of a company's information environment and helps to forecast the drift return (Feldman et al., 2010), Furthermore, Mayew and Venkatachalam (2012) demonstrate that the power of the manager's voice can be used to predict the firm's future earnings. Based on these conclusions about the role of voice pitch and its effects, we believe that the manager's voice pitch can be used to reflect its impact on firm value. Moreover, Dabbs and Mallinger (1999) prove that high testosterone levels predict a low voice pitch in men, and men are also considered to show risk-taking behaviour (Sapienza, Zingales, and Maestripieri, 2009, Stenstrom et al., 2011), especially concerning behaviours in the financial field (Apicella et al., 2008). Meanwhile, the trend of taking more risks normally implies overconfident managers (Menkhoff et al., 2006). Therefore, there is a basis for using voice pitch as a measurement of overconfident managers, and a lower voice pitch may predict a higher level of overconfidence.

According to the explanation of Dabbs and Mallinger (1999), Sapienza, Zingales, and Maestripieri (2009), Stenstrom et al. (2011), people with a low level of voice pitch also have high testosterone level, and thus those people are considered as having more overconfidence than others. The range of the voice pitch ranges from 0 to 300 F_0 in Hz (F_0 in Hz - the measurement of voice pitch). However, to make it suitable for the regression,

we adjust the voice pitch by using 100 divided by it. Therefore, after adjusting, the higher the level of voice pitch adjustment, the higher the level of managerial overconfidence. The adjustment of voice pitch is represented as the following equation.

$$Voice\ pitch\ adjustment = 100/\ Voice\ Pitch$$

All questions used to ask managers during the interview related to corporate aspects, such as cash holdings, debt maturity, merger and acquisitions, and other economic areas.

It should be noted that the interviewees were free to choose whether or not to answer the questions. Furthermore, the content of the answers was not explored in this study as the only purpose of the questions was to record the voice pitch of the managers. The questions are as follows.

> **Question 1**: What are your benchmark decisions relating to cash holding and debt maturity?
> **Question 2**: Do you believe cash holding will impact on firm performance? If yes, explain why.
> **Question 3**: Do you believe debt maturity has an effect on firm performance? If yes, explain why.
> **Question 4**: Do you evaluate your company/compare your company to your competitors? Who are your company's competitors?
> **Question 5**: What is your opinion about acquisition? What do you think about any acquisition in the future of your company?
> How many acquisitions have there been in your company since you were CEO?
> **Question 6**: What do you think about the future economy of Vietnam, for example in the next 10 years?
> **Question 7**: What do you think of the investment opportunities in your company's industry?

Due to the difficulty in having interviews with top managers, only 123 interviews were conducted, whereby 5 managers refused to have the interview recorded. Therefore, 118 interviews were finally recorded. These data are used to represent the overconfidence of managers. There are only 118 recordings, hence these are the first dataset used to run the regression to examine the relationship between managerial overconfidence and firm value. It can be stated that this proxy for overconfidence measurement is new and means that the research is special and unique.

For the second proxy for managerial overconfidence, the gender of managers is considered. In fact, the data on managers' gender are available in databases that are very easy to find, such as from Thomson Reuters EIKON or companies' annual reports. Therefore, in the first

dataset for the first regression model, the gender of managers who were interviews is used as an alternative measurement for overconfidence. Besides that, the gender of managers is also used in the extended sample size for the total of 648 firms to run the same model but with a larger sample size to retest the empirical results of the first model. Note that the gender of managers for the extended data is the gender of all CEOs from 648 firms, but not other managers' gender. Following the paper of Yang and Zhu (2016), Mishra and Metilda (2015), and Huang and Kisgen (2013), males are believed to be more confident than females. Furthermore, from the analysis of the first proxy, males are explained as having higher testosterone, lower voice pitch and more overconfidence than females. Hence, a dummy variable is used, with 1 for male to represent overconfidence and otherwise 0.

For the third proxy for managerial overconfidence, learning from the paper of Schrand and Zechman (2012), the visibility of the CEO's photographs in firms' annual reports is used to measure managerial overconfidence. Accordingly, the size of photographs is given points ranging from 1 to 4, meaning that if there is no CEO's photograph in the annual report, 1 point is given; if the photo is quite small and less than a quarter of a page, the points are 2; if the photo appears bigger than a quarter of a page but less than half of a page, the points are 3; and lastly, if the photo is very big at about at least half of a page, the points are 4. After giving points, it is explained that the higher the points, the more overconfident the manager is. For this data type, photographs of CEOs are examined, but not those of other managers.

In terms of the comprehensive index, by combining from managers' voice pitch, CEOs' photos and managers' gender, it is constructed as follows. Firstly, we find the median value of managers' voice pitch, and then denote the value of 1 for the sample value if it is higher than the median value, and 0 otherwise. Secondly, for the data of CEOs' photos, we believe that CEOs who have the photo appearing at least half of a page are overconfident manager. Therefore, we denote them with the value of 1 for overconfidence, otherwise is 0. For the CEOs' gender, they are actually 1 and 0; hence we do nothing with that. Finally, we calculate the sum of each sample firm based on the denoted points and state that the higher the point of firm, the higher level of managerial overconfidence.

To summarise the measurements for managerial overconfidence, there are four proxies, namely voice pitch adjustment, the gender of managers, the visibility of CEOs' photographs, and the comprehensive index, which are in turn used to measure managerial

overconfidence. Therefore, for each proxy for managerial overconfidence, there is an appropriate regression model with a different sample size. The use of different proxies is believed to ensure very consistent and reliable empirical results.

4.3.3. Proxies for firm value and other control variables for the determinants of firm value

4.3.3.1. Firm performance

For the dependent variable, firm performance is measured by two proxies, namely Tobin Q and market to book value, which are popularly used to represent this term in many studies. The purpose of using both Tobin Q and market to book value for firm performance is to check the reliability of the regression results. It is expected that the regression results from different models of firm performance will produce consistent results with each other.

A number of studies used Tobin Q to measure firm performance or firm value, such as Wernerfelt and Montgomery (1988) and (Mak and Kusnadi, 2005). Tobin Q is calculated by the following equation:

$$\frac{Market\ value\ of\ equity - Book\ value\ of\ equity + Total\ Assets}{Total\ Assets}$$

For market to book value, in this study it is calculated by Market to book is market value of equity plus book value of debt divided by the book value of assets and represented as the following equation (learning from study of Pinkowitz et al., 2006):

$$\frac{Market\ value\ of\ equity + Book\ value\ of\ debt}{Total\ Assets}$$

4.3.3.2. Two other main explanatory variables

Cash holdings

Budin and Handel (1975) and Faulkender (2002) used the cash-sales ratio to estimate cash holdings, while Guney et al. (2003) and Faleye (2004) used cash and marketable securities to total assets as a proxy for cash holdings. Jiang and Lie (2016) represented cash holding through cash and marketable securities. Pinkowits and Williamson (2001) used the natural logarithm of cash over net assets or assets, which is the same as Subramaniam et al. (2011), Al-Najjar (2013) and Venkiteshwaran (2011). Cash and marketable securities over net assets were used by Locorotondo et al. (2014), Megginson (2014) and Liu et al. (2014). Kling et al. (2014), Achary et al. (2012), Kusnadi et al. (2015), Chen et al. (2012), Klasa et

al. (2009), and Hall et al. (2013), and Duchin (2010) used cash and cash equivalents relative to total assets and the ratio of cash and short-term investments to total assets (Ghaly et al., 2015).

Based on the previous studies given above, cash holding in this study is measured by the ratio of cash and equivalent and short-term investment to the total assets. This measurement is the same as the measurement of cash holdings in chapter 2. The purpose is, besides investigating the direct impact of managerial overconfidence on firm performance, finding out the indirect impact of managerial overconfidence on firm performance through examining the effect of managerial overconfidence on cash holdings and then cash holdings on firm performance.

When investigating the determinants of firm performance, many prior studies mention the impact of liquidity on firm performance (Ammanna et al., 2011; Pramborg, 2004; Li et al., 2017). In particular, when using the cash ratio to measure liquidity, Ammanna et al. (2011) find that liquidity has a positive impact on firm performance, while Pramborg (2004) shows no evidence of this relationship. However, when using cash and near cash to total assets for cash holdings, Li et al. (2017) indicate a positive relationship between cash holdings and firm performance. Hence, in this research, the prediction for the impact of cash holdings on firm performance is positive.

Debt maturity

The research of this chapter is based on chapter 3 to construct the proxy for debt maturity by using the ratio of long-term debt to total debt and the ratio of long-term debt to short-term debt. From the review of literature, it is stated that short-term debt negatively impacts on firm performance measured by ROA and insignificant relationship if changed to ROE (Ebaid, 2009). However, when turning to use Tobin Q to measure firm performance as in the study of Cheung et al. (2015), the findings are similar with the findings of Ebaid (2009) in terms of ROA. Therefore, it is predicted that there is a positive relationship between long-term debt that is called debt maturity in this study with firm performance.

4.3.3.3. Variables of managerial traits

LogManager's Age: Age of interviewees was collected through interviews and annual reports. Age is stated to affect management decisions (Orens and Reheul, 2013). As age is a continuous numeric variable, it is converted to logarithmic form to run the model. Manager's age is found to have a positive impact on firm performance in the study of

Mohamed et al. (2015). Hence, in this study, it is expected that manager's age also has a positive impact on firm performance in the regression result.

Managerial ownership: There is a conflict of interest between managers and shareholders, which is known as the agency problem (Jensen, 1986, Jensen and Meckling, 1976). Managerial ownership is the percentage of holding the firm's share, whereby the firm here is the one in which the manager is working. It is found in many previous studies that the impact of managerial ownership on firm performance is different among different studies. For example, according to Mace (1971) and Vancil (1987), managerial ownership has a positive impact on firm performance only when the percentage of managerial ownership is less than 1%. By contrast, if the managerial ownership is higher than 1%, the relationship between these two terms is negative. However, a study of Himmelberg et al. (1999) shows that the changing in managerial ownership is irrelevant to the firm performance. In this study, a higher percentage of ownership is believed to address the conflict in agency problem, hence it is predicted that managerial ownership has a positive impact on firm performance.

4.3.3.4. Other control variables

Ownership concentration

According to Saona and Martin (2016), change in ownership concentration is illustrated as playing an important role in forecasting the change in firm performance. Moreover, Lozano et al. (2015) find that the relationship between ownership concentration and firm performance has a U-shaped form. However, ownership concentration is also showed to positively affect firm value in the research of Vintila and Gherghina (2014). In this study, we expect the relationship between ownership concentration and firm value to also be positive. Ownership concentration is normally measured by the percentage of common shares owned by the largest three shareholders in firms (La Porte et al., 1996, Guney et al. 2006).

Board size

Board size is used in a number of previous studies and has started to play an important role in business operation. It is defined as the number of directors on the board of management (Kusnadi, 2011). According to Yermack (1996), and Lipton and Lorsch (1992), a small board of managers is more effective in corporate management than a larger board of management, especially in the decision-making process. The board size is then transferred

to a logarithm to get a better fit for the regression model. From prior studies, Zabri et al. (2016) and Eisenberg et al. (1998) indicate that board size has a negative relationship with firm performance measured by ROA and measured by Tobin Q (Duru et al., 2013), but an insignificant relationship with firm performance measured by ROE (Zabri et al., 2016). Therefore, this study expects that the effect of board size on firm performance is negative.

LogAssetMaturity

In fact, there has been no evidence to confirm the impact of asset maturity on firm performance. However, it is found that asset maturity plays an important role in corporate management such as on debt maturity (Stohs and Mauer, 1996, Myers, 1977, Mitchell, 1991, Ozkan, 2000, Díaz-Díaz et al., 2016). Hence, we also believe that asset maturity might have an impact on firm performance. In this study, we expect the impact of asset maturity on firm performance to be positive because we think that a longer asset maturity indicates more investment opportunities. The variable of asset maturity in this study is transferred to logarithmic form for a better estimation of the regression.

Z-score:

The study uses Altman's Z-score as the proxy for financial distress and examines the relationship between these two aspects.

Z-score is calculated as follows:

Z-score = 1.2A + 1.4B + 3.3C + 0.6D + 1.0E

Where:

A = Working capital/ Total assets

B = Retained earnings/ Total assets

C = EBIT/ Total Assets

D = Market value of equity/ Book value of total liabilities

E = Sales/ Total Assets

Z-score is used to represent the financial distress of firms. Following its definition, it is known that if the Z-score is greater than 3, then the firm is considered to be in the "safe zone" and has a very small probability of bankruptcy. If the Z-score is between 3 and 1.8, then the firm is indicated to be in the "grey zone" and has a moderate probability of bankruptcy. And finally, if the Z-score is below 1.80, then it is believed to be in the

"distress zone" and has a very high probability of bankruptcy. Hence, it is predicted that a higher Z-score indicates higher firm performance results.

Dividend:

Dividend paid divided by the profit after is used as the variable for dividends in this study. In the research of Jiao (2010), the dividend is found to have a negative impact on firm performance. Thus, in this research, it is also predicted that the same relationship exists between dividend and firm performance as in the research of Jiao (2010).

Leverage

Leverage plays a very important role in corporate finance, especially in firm performance. However, the findings in terms of the impact of leverage on firm performance are controversial among prior studies. For example, leverage is proved to have a significant positive impact on firm performance measured by Tobin Q (Vintila and Gherghina, 2014, Mak and Kusnadi, 2005; Bae et al., 2011). However, it is also found to have a negative relationship with firm performance due to the riskiness of debt and debt overhang (Erickson et al., 2005, Faleye (2007), Konijn et al., 2011). On the other hand, Ammanna et al. (2011) show that leverage has both positive and negative impacts on firm performance. Meanwhile, Wu (2011), Prambord (2004), Uyar and Kilic (2012), and Connelly et al. (2012) indicate that there is no relationship between these two variables. In this study, we expect that there is a positive relationship between leverage and firm performance due to the advantage of a tax shield from debt.

Change in share price

Bourne et al. (2003) stated that share price has a significant impact on firm performance; therefore this study attempts to examine whether or not there is an existing relationship between firm value and change in the share price. The predicted sign regarding the relationship between change in share price and firm performance is positive.

Firm size

Based on the study of Guney et al. (2007) and García-Teruel and Martínez-Solano (2008), this research uses firm size, which is measured by the natural logarithm of gross sales, to examine its effect on firm value. It is explained that the higher the expectations for sales growth, the more a firm has value (Kuzey et al., 2014). Therefore, a number of studies demonstrated a positive relationship between sales growth and firm performance, such as Mak and Kusnadi (62), Hiraki et al. (41), and Jiao (2010). However, on the other hand,

some scholars also found an insignificant impact from sales growth on firm performance, such as in the studies of Wu (92) and Uyar and Kilic (87). This study is based on the statement of the higher the expectations for sales growth, the more a firm has value (Kuzey et al., 2014), thus expecting that the impact of firm size on firm performance is positive.

4.3.4. Model and regression results

4.3.4.1. Firm value and overconfident managers model

Based on a review of the prior literature and with the main purpose of the study finding out the impact of managerial overconfidence on firm value, we construct the main regression model as follows:

$$Firmvalue_i = \beta_0 + \beta_1 Overconfidence_j + \beta_2 LogManager's\ Age_j + \beta_3 MaOwnership_j +$$

$$\beta_4 OConcentration_i + \beta_5 LogBoardsize_i + \beta_6 CashHolding_i + \beta_7 Debtmaturity_i +$$

$$\beta_8 LogAssetMaturity_i + \beta_9 Dividend_i + \beta_{10} ZScore_i + \beta_{11} Leverage_i +$$

$$\beta_{12} Sharepricechange_i + \beta_{13} Firmsize_i + e_i \qquad (5)$$

Based on the construction of proxies for the main model of this study, we provide the following table to express the predicted signs of all variables:

Variables	Symbol	Explanation	Predicted sign	Data source
Dependent variable				
Firm value	Firmvalue1 and Firmvalue2	Represent firm value by the two proxies of Tobin Q and Market to Book value		Thomson Reuter Eikon; Annual reports. Handling calculation
Main explanatory variables				
Overconfident manager 1	Overconfidence1	Measured by voice pitch adjustment	-	Interviews
Overconfident manager 2	Overconfidence2	Gender of CEO and Gender of other managers, 1 if he is male, otherwise 0	-	Annual reports
Overconfident manager 3	Overconfidence3	Measured by the scale of CEO's photos showed in the firms' 2016 annual reports	-	Annual reports
Comprehensive index 1	Overconfidence12	The comprehensive index combined by overconfidence 1 and overconfidence 2 for sub-sample size model	-	Manual calculation
Comprehensive index 2	Overconfidence23	The comprehensive index combined by overconfidence 2 and overconfidence 3 for extended sample size model	-	Manual calculation

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Cash holdings	Cash	Cash and short-term investment/Total Asset	+	Thomson Reuter Eikon; Annual reports
Debt maturity	Debtmaturity1 and Debtmaturity2	The ratio of long-term debt to total debt; and The ratio of long-term debt to short-term debt.	+	Thomson Reuter Eikon; Annual reports
Managerial traits variables				
Managers' Age	LogMaAge	The logarithm of age of managers	+	Interviews; Annual reports
Manager's Ownership	MaOwnership	The percentage of holding the firm's share, which the firm here is the firm the manager is working	+	Annual reports
Other control variables				
Ownership concentration	OConcentration	The total percentage of top 3 owners of the firms	+	Thomson Reuter Eikon; Annual reports
Boardsize	LogBoardsize	The logarithm of number of members in board of directors including director, vice director, chief of financial officer, chief of accounting officer.	-	Thomson Reuter Eikon; Annual reports
Asset maturity	Logarithm of asset maturity	Asset maturity is calculated by net of property plants and equipment divided by depreciation. It is after that transferred into logarithm form	+	Thomson Reuter Eikon; Annual reports. Handling calculation
Dividend	Dividend1	Dividend paid divided by the profit after	+	Thomson Reuter Eikon; Annual reports.
Altman's Z	ZScore	Altman's Z score is the proxy for financial distress	+	Thomson Reuter Eikon; Annual reports. Handling calculation
Financial leverage	Leverage1 and Leverage2	There are two proxies of financial leverage. Leverage1 is measured by total debt divided by total equity Leverage2 is measured by total debt divided by total assets;	+	Thomson Reuter Eikon; Annual reports.
Change in share price	Sharepricechange	The yearly change in share price	+	Thomson Reuter Eikon
Firm size	Firmsize	The logarithm of sales growth. It is adjusted after removing the effect of inflation	+	Thomson Reuter Eikon; Annual reports.

Table 4.1: Expected signs of variables for determinants of firm performance

4.3.4.2. Descriptive statistics

For the sub-sample size model, there are three proxies of overconfidence are used including voice pitch, CEOs' gender and the comprehensive index constructed from manager's voice pitch and CEOs' gender. The proxy of CEOs' photos is not employed in this model due to the regression result is insignificant. The insignificant regression results might due to the small number of sample that makes the regression becomes insignificant. Because when we attempt with extended sample size, it is very significant for all models. Hence, we ignore the proxy of CEOs' photo for the small sample size, but employ this proxy for the extended sample size in the next section.

Although 123 interviews were conducted, 5 of the managers refused to have the interview recorded; therefore, the data Overconfidence1 referring to the voice pitch of managers is only 118. However, the data of the second proxy for overconfidence, Overconfidence2, is for all 123 interviews because the genders of interviewees are easy to collect. In some other data, due to the unavailability of data from a data source, not all data were collected for all 123 firms.

From the statistics data, Overconfidence1 ranges from 0.4 to 0.981, which is equivalent to the maximum value of voice pitch of 250 F_0 in Hz and the minimum value of voice pitch of 101.94 F_0 in Hz, and the mean value of Overconfidence1 is 0.685 which is equivalent to 145 F_0 in Hz. The standard deviation is 0.143. All of the statistics for Overconfidence1 are seen to be reasonable. For Overconfidence2, it is shown that 78.9% of participants are male managers, who are believed to be more overconfident than the rest of the managers of the interviews. Regarding Overconfidence12, it ranges from 0 to 2 depending on the total points from the two previous overconfidence proxies namely voice pitch and CEOs' gender.

For the data of firm value, both the two proxies of firm value are demonstrated to be quite similar with mean values of 1.101 and 0.8, the standard deviations are 0.772 and 0.78, and the maximum values are 5.603 and 5.25. Only the minimum value is a bit different, where Firmvalue1 is 0.281 and Firmvalue2 is 0.06, but the minimal difference is not a problem in this case.

Variable	Observation	Mean	Std. Dev.	Min	Max
Dependent variables					
Firmvalue1	118	1.101	0.772	0.281	5.603
Firmvalue2	118	0.80	0.78	0.06	5.25
Main explanatory variables					
Overconfidence1	118	0.685	0.163	0.400	0.981
Overconfidence2	123	0.789	0.410	0.000	1.000
Overconfidence12	123	1.268	0.790	0.000	2.000
CashHolding	123	0.135	0.161	0.000	0.788
Debtmaturity1	102	3.477	11.682	0.000	81.229
Debtmaturity2	113	0.371	0.357	0.000	1.000
Managerial traits variable					
MaAge	120	41.675	6.165	30.000	57.000
LogMaAge	120	1.615	0.063	1.477	1.756
MaOwnership	122	0.029	0.060	0.000	0.300
Other control variables					
OConcentration	122	0.523	0.212	0.059	0.984
Boardsize	123	4.683	1.762	2.000	9.000
LogBoardsize	123	0.639	0.170	0.301	0.954
LogAssetMaturity	110	1.056	0.581	-0.208	2.962
Dividend	120	0.452	0.650	0.000	4.249
Zscore	110	4.027	10.297	-0.590	76.032
Leverage1	118	0.902	1.152	0.000	5.538
Leverage2	120	0.235	0.203	0.000	0.736
Changeinshareprice	100	0.245	0.585	-0.721	2.125
Firmsize	120	8.600	0.816	6.558	10.670

Table 4.2: Descriptive statistics for sub-sample size firm performance model

Based on the data of managerial age, the youngest manager in this survey is 30 years old, while the oldest manager is 57 years old. These data of managerial age is then transferred to a logarithmic form to have a better fit for the regression models. For managerial ownership, not many managers have a larger percentage of ownership in firms or have no share of firms. The statistics show that there is only 2.9% for the mean value for the managerial ownership, the minimum percentage is 0%, and the highest percentage is 30%. Regarding the data of ownership concentration, it is seen that the concentration level among sample firms is quite large with a mean value of 52.3% and the largest percentage is 98.4%. The number of managers in the board of management is on average about 5 persons. The smallest size of the board is only 2 persons, in contrast to the largest board size of 9 persons. Similarly to managerial age, board size is after that converted to logarithmic form. For the cash holding variable, the average cash holding level of firms is shown with 13.5%, while the smallest level is even 0% and the largest level is 78.7%. In terms of debt maturity, there are two measurements of debt maturity based on two different calculations, but they seem to be consistent with each other and it is illustrated that on average a long-term debt of a firm accounts for 37.1% in total debt with a long-term debt that is 3.477 times short-term debt. There are several firms that operate without any debt, but also some firms that use 100% of the debt. For asset maturity, it is also converted to the logarithmic form for a

better fit of the regression. For the data of dividend, the mean values for the dividend are 0.425, and it is shown that some firms pay no dividend. For the Z-score, it seems that there are a number of Vietnamese firms in bad situations and nearly go bankrupt, whereby the mean value is only 4.027 while the maximum value is 76.032 and the minimum value is -0.59. From the data of leverage, the mean value of total debt over total assets is 23.5%, so not many firms use too much debt to finance their assets. During the research period, there are a number of firms that experienced a decrease in share price; however, there are also a number of firms that witnessed a significant increase whereby the maximum value is 2.125. For the last variable, firm size is shown to be a mean value of 8.6 in the range of 6.558 to 10.

4.3.4.3.   *Correlation Matrix*

Looking at the correlation matrix below, it is seen that overconfidence positively impacts firm value. It is different from the prediction and the positive relationship is the same for both two proxies of overconfidence. LogMaAge and MaOwnership show that there are negative effects on firm value among those managerial trait variables. These are also different from the prediction. Regarding the other control variables at the firm level, OConcentration indicates two different signs in two different proxies of firm value. Meanwhile, the variables of LogBoardsize, LogAssetMaturity, Leverage show different signs from the correlation matrix to the prediction. From the correlation matrix, LogBoardsize, LogAssetMaturity, and Leverage are considered as having a negative effect on firm value. For the remaining variables, all of them have the same results of associations with firm value as the predicted signs.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Firmvalue1 (1)	1.000																		
Firmvalue2 (2)	0.975	1.00																	
Overconfidence1 (3)	0.071	0.070	1.000																
Overconfidence2 (4)	0.038	0.006	0.626	1.000															
Overconfidence12 (5)	0.091	0.079	0.875	0.844	1.000														
LogMaAge (6)	-0.035	0.001	-0.252	-0.299	-0.305	1.000													
MaOwnership (7)	-0.119	-0.087	-0.118	-0.133	-0.161	0.300	1.000												
OConcentration (8)	0.021	-0.052	-0.153	-0.012	-0.084	-0.206	-0.182	1.000											
LogBoardsize (9)	-0.006	-0.064	-0.051	0.157	-0.007	-0.037	-0.150	0.196	1.000										
CashHolding (10)	0.255	0.277	-0.119	-0.208	-0.228	-0.093	-0.095	0.068	-0.020	1.000									
Debtmaturity1 (11)	-0.027	0.013	0.108	0.031	0.086	-0.088	-0.080	0.102	0.090	-0.081	1.000								
Debtmaturity2 (12)	0.040	0.096	0.002	-0.037	0.012	-0.053	-0.083	0.086	0.068	-0.064	0.465	1.000							
LogAssetMaturity (13)	-0.108	-0.092	0.117	-0.034	0.086	-0.159	-0.183	0.127	-0.155	-0.022	0.123	0.417	1.000						
Dividend (14)	0.060	0.081	-0.252	-0.241	-0.236	0.045	0.013	0.039	0.001	0.307	0.020	0.087	0.295	1.000					
Zscore (15)	0.448	0.491	0.030	0.049	0.099	-0.148	-0.032	-0.226	-0.245	0.096	-0.029	0.097	0.190	-0.002	1.000				
Leverage1 (16)	-0.127	-0.131	0.021	0.080	0.046	-0.125	-0.079	0.022	0.062	-0.335	0.076	-0.039	-0.009	-0.171	-0.233	1.000			
Leverage2 (17)	-0.181	-0.117	-0.017	-0.014	-0.006	-0.092	-0.112	-0.016	0.096	-0.319	0.196	0.061	-0.021	-0.142	-0.293	0.829	1.000		
Changeinshareprice (18)	0.369	0.386	-0.166	-0.234	-0.176	0.035	-0.059	-0.042	-0.012	0.251	0.013	0.03	-0.099	0.117	0.309	-0.156	-0.244	1.000	
Firmsize (19)	0.229	0.220	-0.176	-0.163	-0.235	0.013	-0.186	0.071	0.537	0.171	-0.039	-0.008	-0.135	0.189	-0.073	0.104	-0.000	0.191	1.000

Table 4.3: Correlation matrix for the sub-sample size firm performance model

4.3.5. Findings and empirical results

4.3.5.1. Managerial overconfidence and firm value

A total of 12 different models are created by using different proxies of firm value, overconfidence, debt maturity, and leverage. The reason for using different proxies is explained in the previous part, namely that it helps to make the research becomes more reliable. After the GLS regression, the number of observations is reduced due to the lack of some data among the variables; therefore, the number of observations is just from 80 to 87 depending on each type of data. The empirical results are described as follows.

Very interestingly, managerial overconfidence is demonstrated as having a significantly positive relationship with firm value. That means that the more the overconfidence level of manager, the higher the result in firm value. The results are illustrated as being the same for almost all proxies of overconfidence and with almost all different models with different proxies of some independent variables. Furthermore, the results from the models with the first proxy and the comprehensive index of overconfidence indicate that the models are very appropriate with *Pro>chi2* equal 0 and the variable of overconfidence is significant at the 1% and 5% level for all models.

Besides the regression results for managerial overconfidence, the empirical results also reveal the significance level of some of the other variables in this model. Accordingly, LogMaAge is indicated as slightly impacting on firm value among two different models. The positive relationships with firm value are also demonstrated for the variables of cash holdings, ownership concentration, Z-score, change in share price, and firm size. For the Z-score and firm size, there is a very strong confirmation that they have a positive relationship with firm value, whereby it is significant at the almost 1% and 5% level across all different models. It is quite similar for ownership concentration and change in share price as many models indicate the significant results. For manager's age, there are only 2 models showing a positive relationship with firm value. In contrast, debt maturity, managerial ownership, board size, dividend, and leverage are found with no evidence showing the relationship between leverage and firm value.

INDEPENDEN	DEPENDENT VARIABLE											
	Firmvalue1						Firmvalue2					
								8	9	10	11	12
MAIN EXPLANATORY VARIABLES												
Overconfidence1	0.911**		1.112***				0.914**		1.103***			
	(0.402)		(0.438)				(0.399)		(0.431)			
Overconfidence2		0.296*		0.407**				0.240		0.362*		
		(0.178)		(0.201)				(0.178)		(0.199)		
Overconfidence12					0.183**	0.172**					0.251***	0.249***
					(0.085)	(0.084)					(0.095)	(0.093)
CashHolding	0.905	1.032*	0.895	1.083*	1.092*	1.306**	1.134**	1.228**	1.087*	1.248**	1.163**	1.352**
	(0.571)	(0.588)	(0.607)	(0.627)	(0.582)	(0.580)	(0.567)	(0.587)	(0.596)	(0.619)	(0.616)	(0.605)
Debmaturity1			-0.001	0.001					0.004	0.006	0.000	0.005
			(0.007)	(0.007)					(0.007)	(0.007)	(0.007)	(0.007)
Debmaturity2	0.065	0.080			0.058	0.146	0.154	0.162				
	(0.191)	(0.194)			(0.191)	(0.191)	(0.190)	(0.194)				
VARIABLE OF MANAGERIAL TRAITS												
LogMaAge	1.193	1.068	1.8205	1.748	1.154	1.321	1.389	1.197	2.285*	2.131	1.983	2.446*
	(1.213)	(1.229)	(1.340)	(1.371)	(1.214)	(0.084)	(1.203)	(1.226)	(1.317)	(1.355)	(1.348)	(0.093)
MaOwnership	-0.935	-1.096	-1.038	-0.977	-0.804	-0.370	-0.467	-0.674	-0.589	-0.574	-0.710	-0.265
	(1.668)	(1.687)	(1.779)	(1.811)	(1.681)	(1.673)	(1.655)	(1.683)	(1.749)	(1.789)	(1.787)	(1.756)
FIRM LEVEL VARIABLES												
OConcentration	0.615**	0.522*	0.721**	0.597*	0.550*	0.341	0.410	0.309	0.520	0.387	0.659**	0.458
	(0.301)	(0.301)	(0.321)	(0.317)	(0.298)	(0.297)	(0.299)	(0.300)	(0.316)	(0.313)	(0.314)	(0.309)
LogBoardsize	-0.348	-0.535	-0.281	-0.558	-0.432	-0.687	-0.610	-0.755	-0.516	-0.759	-0.407	-0.641
	(0.456)	(0.480)	(0.465)	(0.496)	(0.460)	(0.458)	(0.452)	(0.479)	(0.457)	(0.490)	(0.467)	(0.459)
LogAssetsmaturity	-0.310***	-0.244*	-0.301**	-0.199	-0.274**	-0.290**	-0.326***	-0.266**	-0.300**	-0.205	-0.251*	-0.251*
	(0.133)	(0.135)	(0.138)	(0.141)	(0.132)	(0.132)	(0.132)	(0.134)	(0.135)	(0.140)	(0.136)	(0.134)
Dividend	0.083	0.054	0.096	0.051	0.060	0.066	0.091	0.058	0.101	0.055	0.066	0.071
	(0.097)	(0.097)	(0.103)	(0.102)	(0.096)	(0.096)	(0.097)	(0.097)	(0.102)	(0.101)	(0.101)	(0.099)
Zscore	0.043***	0.039***	0.041***	0.035***	0.040***	0.044***	0.046***	0.042***	0.045***	0.040***	0.038***	0.041***
	(0.009)	(0.009)	(0.009)	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.010)	(0.009)	(0.009)
Leverage1	0.077	0.056	0.058	0.035	0.071	0.099	0.105	0.085	0.080	0.058	0.053	0.075
	(0.065)	(0.065)	(0.067)	(0.068)	(0.065)	(0.064)	(0.064)	(0.065)	(0.066)	(0.067)	(0.067)	(0.065)
Changshareprice	0.196	0.214	0.263*	0.307**	0.195	0.193	0.196	0.204	0.256*	0.291**	0.275**	0.269**
	(0.126)	(0.131)	(0.144)	(0.151)	(0.127)	(0.126)	(0.125)	(0.131)	(0.142)	(0.150)	(0.144)	(0.142)
Firmsize	0.230**	0.241**	0.185*	0.216**	0.251***	0.262***	0.243***	0.248***	0.215**	0.240**	0.222***	0.252***
	(0.100)	(0.103)	(0.107)	(0.111)	(0.101)	(0.101)	(0.099)	(0.102)	(0.105)	(0.109)	(0.108)	(0.106)
Constant	-3.549	-2.884	-4.285*	-3.762	-3.227	-0.038*	-4.123*	-3.262	-5.434**	-4.718**	-4.365*	-5.510**
	(2.270)	(2.259)	(2.491)	(2.515)	(2.240)	(0.237)	(2.252)	(2.254)	(2.449)	(2.485)	(2.479)	(2.437)
Number of Obs												
Wald chi2												
Prob > chi2												

Notes: The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1 % level, respectively. The standard errors are robust to heteroscedasticity.
Note that the alternative independent variables such as Leverage2 are in turn interchangeable to models. The results revealed the same relationship with firm value.

Table 4.4: Regression results of managerial overconfidence and firm performance

In fact, to make the regression results more robust, we attempted to check the non-linearity between managerial overconfidence and firm performance to examine whether overconfidence might increase firm value at a certain level of overconfidence, but if the level of overconfidence increases further, the performance of firms might be reduced. However, after checking whether or not there exists a non-linear relationship between managerial overconfident and firm performance, we found that the relationship between these two terms is linear, meaning that the impact of managerial overconfidence on firm value is definitely positive.

4.3.5.2. Firm value and managerial overconfidence in the extended sample size

To strengthen the result of overconfidence positively impacting on firm value, we conduct the second empirical research with an extended sample size by using all data of 648 listed firms on the Vietnamese stock exchange market. After the GLS regression, the number of observations is reduced due to the lack of data from some variables. Hence, the total number of observations is shown to be in the range of 415 and 523. The results of *Wald chi2* and *Prob>chi2* also indicate that all models are fitted and significant. For the second extended sample size, the three proxies for overconfidence related to CEOs' gender, CEOs' photos, and the comprehensive index combined by CEOs' gender and CEOs' photos called Overconfidence23 are used when they are available for a larger sample size. Note that the gender of managers in this part's sample size is different from that of in the small sample size. More specifically, managers' gender in the small sample size is the gender of interviewees including all top managers such as CEO, CFO, CAO, and vice manager, but in the larger sample size, they are the only the gender of CEOs for all firms.

Once more, the positive relationship between managerial overconfidence and firm value is confirmed for almost all models with three proxies of overconfidence at the 1%, 5% and 10% significance levels. For Overconfidence3 with the second proxy of firm value named Firmvalue2, they are shown to be insignificant, but for the rest, they are significant. Hence, they are still very strong and confirm the positive impact of overconfidence on firm value.

The same results are revealed for other variables, such as logarithm of managerial age, ownership concentration, the logarithm of asset maturity, Z-score , change in share price and firm size. The significance level of all those variables is shown to be higher and for more models than in the small sample size. Furthermore, the role of debt maturity, board size and leverage are also presented, whereby it is shown that there is a significantly

positive relationship with firm value in almost all models. However, for cash holdings, we cannot find any evidence of its impact on firm value.

INDEPENDENT VARIABLES	DEPENDENT VARIABLE											
	Firmvalue1						Firmvalue2					
	13	14	15	16	17	18	19	20	21	22	23	24
MAIN EXPLANATORY VARIABLES												
Overconfidence2	0.045**			0.044**			0.052***			0.046**		
	(0.022)			(0.020)			(0.021)			(0.020)		
Overconfidence3		0.121*			0.122*			0.043			0.011	
		(0.071)			(0.068)			(0.073)			(0.069)	
Overconfidence23			0.058***			0.046***			0.049***			0.041**
			(0.02)			(0.018)			(0.020)			(0.018)
CashHolding	0.077	0.001	0.060	-0.014	0.058	-0.022	-0.033	-0.046	-0.039	-0.109	-0.026	-0.115
	(0.122)	(0.113)	(0.122)	(0.121)	(0.117)	(0.121)	(0.126)	(0.119)	(0.127)	(0.122)	(0.120)	(0.122)
Debmaturity1				0.017**	0.015**	0.017**				0.040***	0.040***	0.040***
				(0.008)	(0.008)	(0.008)				(0.008)	(0.008)	(0.008)
Debmaturity2	0.042	0.098**	0.039				0.164***	0.220***	0.164***			
	(0.051)	(0.047)	(0.051)				(0.056)	(0.051)	(0.056)			
VARIABLE OF MANAGERIAL TRAITS												
LogMaAge	0.354	0.286	0.335	0.523***	0.341*	0.500***	0.280	0.150	0.260	0.428**	0.292	0.406**
	(0.219)	(0.202)	(0.218)	(0.207)	(0.202)	(0.206)	(0.222)	(0.209)	(0.221)	(0.205)	(0.204)	(0.205)
MaOwnership	-0.077	-0.039	-0.086	-0.258	-0.141	-0.261	-0.051	0.028	-0.054	-0.195	-0.090	-0.194
	(0.176)	(0.158)	(0.175)	(0.167)	(0.160)	(0.166)	(0.177)	(0.164)	(0.177)	(0.166)	(0.162)	(0.165)
FIRM LEVEL VARIABLES												
OConcentration	0.249***	0.199***	0.247***	0.148**	0.174***	0.150**	0.179**	0.137*	0.176**	0.034	0.043	0.033
	(0.079)	(0.073)	(0.078)	(0.074)	(0.072)	(0.074)	(0.078)	(0.073)	(0.078)	(0.074)	(0.073)	(0.073)
LogBoardsize	0.315***	0.240**	0.295***	0.188**	0.237*	0.181	0.091	0.013	0.085	-0.007	0.071	-0.009
	(0.119)	(0.108)	(0.118)	(0.113)	(0.109)	(0.113)	(0.120)	(0.112)	(0.120)	(0.112)	(0.110)	(0.112)
LogAssetsmaturity	-0.073**	-0.045	-0.072**	0.009	-0.008	0.009	-0.041	-0.018	-0.040	0.041	0.028	0.041
	(0.038)	(0.036)	(0.038)	(0.037)	(0.036)	(0.037)	(0.039)	(0.037)	(0.039)	(0.037)	(0.036)	(0.037)
Dividend	-0.010	-0.010	-0.009	-0.009	-0.011	-0.009	-0.005	-0.011	-0.005	-0.011	-0.014	-0.012
	(0.013)	(0.012)	(0.013)	(0.012)	(0.012)	(0.012)	(0.013)	(0.012)	(0.013)	(0.012)	(0.012)	(0.012)
Zscore	0.067***	0.080***	0.068***	0.123***	0.125***	0.124***	0.097***	0.109***	0.098***	0.160***	0.164***	0.161***
	(0.006)	(0.006)	(0.005)	(0.009)	(0.009)	(0.008)	(0.006)	(0.006)	(0.006)	(0.008)	(0.010)	(0.008)
Leverage1	0.044***	0.037**	0.045***	0.063***	0.054***	0.063***	0.053***	0.046***	0.053***	0.077***	0.069***	0.077***
	(0.016)	(0.015)	(0.016)	(0.015)	(0.015)	(0.015)	(0.016)	(0.015)	(0.016)	(0.015)	(0.015)	(0.015)
Changshareprice	0.262***	0.226***	0.258***	0.210***	0.197***	0.207***	0.223***	0.187***	0.220***	0.171***	0.163***	0.168***
	(0.029)	(0.027)	(0.029)	(0.028)	(0.027)	(0.028)	(0.029)	(0.027)	(0.029)	(0.027)	(0.027)	(0.027)
Firmsize	0.046	0.051**	0.045	0.001	0.004	0.002	0.057**	0.084***	0.061	0.029	0.029	0.032
	(0.029)	(0.026)	(0.029)	(0.029)	(0.028)	(0.029)	(0.030)	(0.027)	(0.029)	(0.029)	(0.028)	(0.029)
Constant	-0.555	-0.554	-0.567	-0.507	-0.333	-0.517	-0.749*	-0.764**	-0.787**	-0.823**	-0.615	-0.845**
	(0.413)	(0.384)	(0.409)	(0.390)	(0.381)	(0.388)	(0.419)	(0.397)	(0.417)	(0.388)	(0.385)	(0.387)
Number of Obs	522	491	523	435	417	436	490	466	491	433	415	434
Wald chi2	451.5	498.95	459.53	477.2	415.67	480.23	531.45	575.77	532.86	644.06	538.97	644.91
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1 % level, respectively. The standard errors are robust to heteroscedasticity. Note that the alternative independent variables such as Leverage2 are in turn interchangeable to models. The results revealed the same relationship with firm value.

Table 4.5: Regression results for the extended sample size of firm performance

4.3.5.3. Determinants of firm value: the case of general control variables

4.3.5.3.1. A model for the case of the control variables in the main regression model

In order to retest the relationship of all general control variables in the empirical models in the last two parts, including cash holdings, debt maturity, logarithm of asset maturity, dividend, Z-score, leverage, change in share price, and firm size, this section uses a very large sample size, increasing the sample size of 648 firms from just the period of one year in 2016 to panel data of up to 4000 observations in the period of 2005 to 2016. The number of observations varies depending on the year of firms since they listed on the stock exchange market. The extended research period creates a new total number of observations up to 3280 to 3975. The results from *prob>chi2*, *F test* and *Pro>F* indicate that all models are very significant. The kind of data in this section is panel data; therefore, with each model, we run both the GLS and fixed effect regression to examine the effect of all control variables on firm value.

The empirical results from the regressions demonstrate that all control variables in the model significantly impact on firm value except for dividend. There is no evidence to show a significant relationship between dividend and firm value in this research. Meanwhile, for the remaining variables, almost all variables are very significant at the 1%, 5% and 10% significance levels. However, in cash holdings and firm size, it is recognized that there are both side effects from those variables on firm value.

INDEPENDENT VARIABLES	DEPENDENT VARIABLE															
	Firmvalue1								Firmvalue2							
	FE (25)	GLS (26)	FE (27)	GLS (28)	FE (29)	GLS (30)	FE (31)	GLS (32)	FE (33)	GLS (34)	FE (35)	GLS (36)	FE (37)	GLS (38)	FE (39)	GLS (40)
CashHolding	-0.078	0.129***	-0.111	0.076	-0.049	0.155***	-0.079	0.093*	-0.137**	0.072	-0.132*	0.060	-0.078	0.225***	-0.076	0.195***
	(0.063)	(0.049)	(0.070)	(0.054)	(0.063)	(0.049)	(0.069)	(0.054)	(0.064)	(0.051)	(0.070)	(0.057)	(0.062)	(0.050)	(0.068)	(0.054)
Debmaturity1			0.000	0.005***			-0.001	0.005***			0.000	0.008***			-0.001	0.006***
			(0.001)	(0.001)			(0.001)	(0.001)			(0.001)	(0.001)			(0.001)	(0.001)
Debmaturity2	0.053**	0.151***			0.032	0.144***			0.096***	0.212***			0.049**	0.179***		
	(0.025)	(0.019)			(0.025)	(0.019)			(0.026)	(0.019)			(0.025)	(0.019)		
LogAssetsmaturity	0.013	-0.002	0.013	0.013	0.008	-0.003	0.008	0.011	0.039**	0.037***	0.046***	0.073***	0.028	0.031**	0.034**	0.065***
	(0.018)	(0.013)	(0.018)	(0.014)	(0.018)	(0.013)	(0.018)	(0.014)	(0.018)	(0.014)	(0.019)	(0.014)	(0.018)	(0.013)	(0.018)	(0.014)
Dividend	-0.005	-0.005	-0.004	-0.005	-0.005	-0.006	-0.004	-0.006	0.001	-0.003	0.000	-0.004	-0.002	-0.006	-0.002	-0.007
	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.006)	(0.005)	(0.006)	(0.005)	(0.005)
Zscore	0.073***	0.078***	0.113***	0.097***	0.077***	0.080***	0.122***	0.099***	0.087***	0.104***	0.126***	0.125***	0.098***	0.112***	0.143***	0.139***
	(0.003)	(0.002)	(0.004)	(0.003)	(0.003)	(0.002)	(0.004)	(0.003)	(0.003)	(0.002)	(0.004)	(0.003)	(0.003)	(0.002)	(0.004)	(0.003)
Leverage1					0.531***	0.247***	0.694***	0.325***					1.010***	0.739***	1.149***	0.828***
					(0.058)	(0.039)	(0.058)	(0.040)					(0.058)	(0.039)	(0.057)	(0.040)
Leverage2	0.077***	0.040***	0.099***	0.053***					0.123***	0.063***	0.139***	0.068***				
	(0.011)	(0.008)	(0.011)	(0.007)					(0.011)	(0.008)	(0.011)	(0.008)				
Changshareprice	0.235***	0.238***	0.200***	0.213***	0.231***	0.236***	0.196***	0.211***	0.229***	0.223***	0.193***	0.194***	0.223***	0.216***	0.187***	0.187***
	(0.008)	(0.009)	(0.007)	(0.009)	(0.008)	(0.009)	(0.007)	(0.009)	(0.008)	(0.009)	(0.007)	(0.009)	(0.007)	(0.009)	(0.007)	(0.008)
Firmsize	-0.052**	0.087***	-0.115***	0.067***	-0.064***	0.079***	-0.129***	0.057***	-0.093***	0.074***	-0.138***	0.059***	-0.123***	0.023***	-0.168***	-0.001
	(0.024)	(0.009)	(0.025)	(0.011)	(0.024)	(0.009)	(0.025)	(0.01)	(0.025)	(0.011)	(0.026)	(0.011)	(0.024)	(0.010)	(0.025)	(0.010)
Constant	1.155***	-0.079	1.611***	0.08	1.185***	-0.038	1.609***	0.118	1.136***	-0.363***	1.452***	-0.253***	1.236***	-0.084	1.481***	0.057
	(0.213)	(0.083)	(0.222)	(0.086)	(0.212)	(0.084)	(0.219)	(0.086)	(0.216)	(0.087)	(0.225)	(0.091)	(0.211)	(0.085)	(0.216)	(0.087)
Number of Obs	3975	3975	3337	3337	3970	3970	3337	3337	3873	3873	3280	3280	3869	3869	3280	3280
Wald chi2		2891.49		2387.1		2908.67		2411.99		3564.43		2775.31		4114.19		3407.21
Prob > chi2		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
F test	247.82		240.32		254.91		252.56		275.93		256.59		313.95		307.35	
Prob > F	0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	

Notes: The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1 % level, respectively. The standard errors are robust to heteroscedasticity.

Table 4.6: Regression results of firm performance determinants: general control variables

4.3.5.3.2. An extended model with macro variables

In this section, we attempt to extend the model with some macro variables. Following the economic model of firm performance and the organizational model of firm performance, it is believed that some macro variables might have an impact on firm performance; therefore, this study focuses on some of the main macro variables such as GDP, inflation rate, and the trade openness of the country and industry to examine all potential variables that might determine firm performance. Furthermore, inflation and GDP growth rate are also found having positively significant impact on firm growth in the study of Beck et al. (2005). Additionally, in the research of Boubakri et al. (2005), it is indicated that change in firm performance depends significantly on macro variables. More specifically, economic growth positively impacts in a higher profitability and efficiency gains, and trade liberalization significantly related to a higher levels of investment and output. Moreover, real GDP is found associated with firm performance in the research of Omran et al. (2008). Regarding industry effect, there are also some evidences from the papers of Omran et al. (2008) and Beck et al. (2005) indicate that there is a difference in firm performance among firms in different industries. Therefore, in this section, we also believe that inflation, GDP growth, and trade openness are expected to positively impact on firm performance. Also, we expect there are different firm performance results among firms in different industries.

The GDP variable is the percentage of the annual growth rate of gross domestic products. The variable of inflation is the inflation rate measured by the consumer price index and reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services. Trade openness is measured by the ratio of exports plus imports to GDP. All data of GDP, inflation and trade openness are collected from the World Bank from 2005 to 2016 for Vietnam. Regarding industry, based on all firms' websites, we classify all firms into three types of industry namely merchandising, manufacturing and services. The variables of industries are dummy variables in the model.

INDEPENDENT VARIABLES	DEPENDENT VARIABLE							
	Firmvalue1	Firmvalue2	Firmvalue1	Firmvalue2	Firmvalue1	Firmvalue2	Firmvalue1	Firmvalue2
‥‥‥‥	GLS (41)	GLS (42)	GLS (43)	GLS (44)	GLS (45)	GLS (46)	GLS (47)	GLS (48)
CashHolding	0.159***	0.091*	0.080	0.050	0.174***	0.229***	0.090*	0.172***
	(0.048)	(0.050)	(0.053)	(0.055)	(0.048)	(0.049)	(0.053)	(0.053)
Debmaturity1			0.005***	0.008***			0.005***	0.006***
			(0.001)	(0.001)			(0.001)	(0.001)
Debmaturity2	0.142***	0.207***			0.138***	0.175***		
	(0.018)	(0.019)			(0.018)	(0.018)		
LogAssetsmaturity	0.002	0.049***	0.015	0.082***	0.000	0.040***	0.012	0.072***
	(0.013)	(0.014)	(0.014)	(0.014)	(0.013)	(0.013)	(0.014)	(0.014)
Dividend1	-0.002	0.001	-0.002	-0.001	-0.002	-0.002	-0.002	-0.004
	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Zscore	0.076***	0.101***	0.091***	0.120***	0.077***	0.109***	0.093***	0.135***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
Leverage1					0.202***	0.692***	0.279***	0.791***
					(0.038)	(0.038)	(0.039)	(0.039)
Leverage2	0.036***	0.058***	0.049***	0.064***				
	(0.007)	(0.008)	(0.007)	(0.008)				
Changshareprice	0.201***	0.180***	0.178***	0.156***	0.200***	0.176***	0.176***	0.150***
	(0.009)	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Firmsize	0.091***	0.079***	0.075***	0.069***	0.086***	0.032***	0.068***	0.011
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
GDP	0.169***	0.169***	0.161***	0.157***	0.167***	0.162***	0.159***	0.147***
	(0.012)	(0.013)	(0.012)	(0.013)	(0.012)	(0.012)	(0.012)	(0.012)
Inflation	-0.005***	-0.007***	-0.006***	-0.008***	-0.005***	-0.007***	-0.006***	-0.008***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Openness	-0.005***	-0.005***	-0.004***	-0.005***	-0.005***	-0.004***	-0.004***	-0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Manufacturing	0.051***	0.043***	0.023	0.000	0.050***	0.032***	0.022	-0.011
	(0.017)	(0.018)	(0.017)	(0.018)	(0.017)	(0.017)	(0.017)	(0.017)
Merchandise	-0.016	-0.066***	-0.035	-0.089***	-0.013	-0.058***	-0.032	-0.091***
	(0.021)	(0.021)	(0.021)	(0.022)	(0.021)	(0.021)	(0.021)	(0.021)
Constant	-0.342***	-0.627***	-0.229***	-0.489***	-0.319***	-0.378***	-0.208*	-0.216*
	(0.112)	(0.115)	(0.114)	(0.120)	(0.113)	(0.112)	(0.114)	(0.115)
Number of Obs	3962	3860	3329	3272	3957	3856	3329	3772
Wald chi2	3321.83	4060.45	2760.84	3172.68	3325.3	4598.14	2771.77	3816.54
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 4.7: Determinants of firm performance: models with macro variable

The regression results from the extended model with the macro variables show similar findings in terms of the relationship between cash holdings, debt maturity, asset maturity, Z-score, leverage, change in share price, and firm size with firm performance. However, the significance levels of all variables seem to be higher and stronger in this model. The dividend is once again found to be similar to the findings in the previous models in that there is no evidence suggesting the impact of this term on firm performance. Furthermore, all macro variables are found to have a significant impact on firm performance. Specifically, when GDP increases, it might create a more advantageous environment for firms and hence help to increase firm performance. In contrast, inflation and trade openness showed a negative impact on firm value. In terms of industry, it is shown that for manufacturing firms, firm performance seems to be better than it is for merchandisers and services. Meanwhile, the evidence also shows that merchandisers' performance seems to be lower than that of the others. All different models with different proxies of some variables

indicate quite consistent results. Hence, the findings are believed to be very reliable and significant.

4.3.5.3.3. Endogeneity problem and GMM model

In fact, when doing research with a model that has many explanatory variables, there might be a problem of endogeneity. If there is a problem of endogeneity in the model, the OLS, GLS become less strong estimations. Hence, we need to identify the endogeneity in the model and apple more appropriate regression estimations. Endogeneity is in which an explanatory variable is correlated with the error term or other omitted variables. In the empirical regression model of this study, a number of control variables, namely cash holdings, debt maturity, dividend, and leverage, might be explained by other variables. Specifically, cash holdings is determined by firm value, Z-score, leverage, change in share price, firm size and profitability, as in the findings of chapter 2. Debt maturity is shown to be impacted by liquidity, asset maturity, dividend, leverage and intangible assets, as shown in chapter 3. Dividend can be explained by yield, firm size, profitability, debt to equity ratio, leverage and liquidity (Patra et al., 2012) and by profitability, firm risk, net cash flow, tax, institution ownerships, firm growth and firm value (market to book value) (Amidu and Abor, 2006). Leverage can be impacted by assets maturity, firm size, profitability, tangible assets, tax rate and net operating loss (Barclay et al., 2003). Therefore, we can state that there might be a problem of endogeneity in the research model. In order to address endogeneity, we use the dynamic panel-data estimation called the Generalised Method of Moments (GMM) estimation method (Blundell and Bond, 1998). In fact, the use of GMM brings two advantages; firstly, the GMM method is more effective in controlling for a potential endogeneity problem than the fixed-effect estimation method because fixed-effect estimation does not consider the endogeneity problem in its regression. Meanwhile, it is believed that there is an existence of endogeneity in the research model. Therefore, the GMM method is a good way to get other predicted results after addressing the endogeneity problem that will enable the empirical results on the determinants of cash holdings to become stronger. Secondly, the GMM method is also believed to address the dynamic behaviour of firms.

The results are presented in table 4.8 for cross-sectional models and 4.9 for panel models below. In terms of cross-sectional models, the instrumental variables GMM is used to test the relationship from managerial overconfidence, cash holdings and debt maturity with firm

value. The results of *Wald Chi2, Prob > Chi2* from all models indicate that all models are appropriate. Almost all models also reveal a positively significant relationship between managerial overconfidence and firm value. Regarding cash holdings, there is a moderate relationship is shown with firm value. Meanwhile, a very weak impact from debt maturity is found in the relationship with firm value. Among other control variables, only Zscore is indicated having a very strong relationship with firm value; manager's age is found with a moderate effect on firm value. By contrast, for the rest of control variables, there is no evidence indicating any relationship with firm value.

INDEPENDENT VARIABLES	DEPENDENT VARIABLE											
	Firmvalue (GMM for cross-sectional data)											
	Firmvalue1 (49)	Firmvalue1 (50)	Firmvalue1 (51)	Firmvalue2 (52)	Firmvalue2 (53)	Firmvalue2 (54)	Firmvalue1 (55)	Firmvalue1 (56)	Firmvalue1 (57)	Firmvalue2 (58)	Firmvalue2 (59)	Firmvalue2 (60)
MAIN EXPLANATORY VARIABLES												
Overconfidence1	1.119			1.140*			1.319*			1.319*		
	(0.683)			(0.690)			(0.731)			(0.715)		
Overconfidence3		0.731*			0.716			0.898*			0.876*	
		(0.436)			(0.438)			(0.490)			(0.487)	
Overconfidence13			0.389**			0.396**			0.471**			0.479**
			(0.201)			(0.199)			(0.219)			(0.213)
CashHolding	8.473	8.912*	8.606*	9.381*	9.835*	9.515**	8.616	(8.983	8.395	9.147	9.529*	8.906*
	(5.366)	(5.263)	(5.002)	(5.402)	(5.308)	(5.040)	(5.861)	(5.672)	(5.188)	(5.866)	(5.680)	(5.178)
Debmaturity1							0.005	0.007	0.005	0.009*	0.012	0.009**
							(0.006)	(0.006)	(0.005)	(0.006)	(0.006)	(0.005)
Debmaturity2	0.163	0.223	0.161	0.261	0.319	0.258						
	(0.354)	(0.386)	(0.351)	(0.371)	(0.403)	(0.370)						
VARIABLE OF MANAGERIAL TRAITS												
LogMaAge	3.806	4.104	4.041	4.235	4.513*	4.476*	4.338	5.035*	5.012*	4.913*	5.576*	5.610**
	(2.572)	(2.662)	(2.505)	(2.617)	(2.729)	(2.550)	(2.813)	(3.045)	(2.771)	(2.758)	(3.021)	(2.710)
MaOwnership	-0.127	-0.018	0.481	0.415	0.504	1.034	0.501	0.999	1.230	1.017	1.497	1.762
	(2.689)	(2.643)	(2.602)	(2.784)	(2.759)	(2.699)	(2.825)	(2.694)	(2.636)	(2.790)	(2.685)	(2.596)
FIRM LEVEL VARIABLES												
OConcentration	0.393	0.328	0.386	0.168	0.098	0.161	0.527	0.482	0.586	0.318	0.266	0.382
	(0.574)	(0.571)	(0.556)	(0.608)	(0.605)	(0.590)	(0.601)	(0.580)	(0.555)	(0.609)	(0.590)	(0.560)
LogBoardsize	0.341	-0.156	0.104	0.141	-0.342	-0.101	0.306	-0.345	-0.011	0.097	-0.535	-0.227
	(0.652)	(0.630)	(0.628)	(0.683)	(0.666)	(0.663)	(0.675)	(0.623)	(0.617)	(0.685)	(0.643)	(0.631)
LogAssetsmaturity	-0.015	0.100	0.012	-0.005	0.110	0.023	-0.045	0.131	-0.009	-0.033	0.140	0.002
	(0.311)	(0.332)	(0.311)	(0.337)	(0.363)	(0.340)	(0.322)	(0.366)	(0.319)	(0.339)	(0.389)	(0.338)
Dividend1	-0.265	-0.282	-0.258	-0.288	-0.309	-0.281	-0.235	-0.263	-0.213	-0.244	-0.275	-0.220
	(0.312)	(0.279)	(0.280)	(0.328)	(0.296)	(0.297)	(0.332)	(0.289)	(0.280)	(0.342)	(0.300)	(0.289)
Zscore	0.044***	0.035***	0.039***	0.047***	0.038***	0.043***	0.044***	0.032***	0.038***	0.048***	0.036***	0.041***
	(0.010)	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)	(0.011)	(0.009)	(0.009)	(0.011)	(0.010)	(0.009)
Leverage1	0.309	0.282	0.305*	0.358*	0.332*	0.353*	0.275	0.237	0.256	0.307	0.270	0.287*
	(0.191)	(0.182)	(0.182)	(0.197)	(0.191)	(0.189)	(0.187)	(0.174)	(0.169)	(0.189)	(0.178)	(0.170)
Changshareprice	0.097	0.184	0.130	0.088	0.172	0.122	0.043	0.188	0.119	0.027	0.166	0.106
	(0.157)	(0.167)	(0.154)	(0.169)	(0.182)	(0.168)	(0.208)	(0.214)	(0.196)	(0.218)	(0.227)	(0.208)
Firmsize	0.115	0.175	0.188	0.119	0.176	0.193	0.074	0.162	0.167	0.099	0.184	0.194
	(0.190)	(0.180)	(0.178)	(0.196)	(0.185)	(0.183)	(0.209)	(0.192)	(0.186)	(0.210)	(0.194)	(0.186)
Constant	-8.753*	-9.245*	-9.377**	-9.794**	-10.210**	-10.432**	-9.139*	-10.386*	-10.519**	-10.500**	-11.662*	-11.938**
	(5.111)	(5.179)	(4.961)	(5.102)	(5.227)	(4.956)	(5.498)	5.824	(5.375)	(5.360)	(5.767)	5.233
Number of Obs	87	87	87	87	87	87	80	80	80	80	80	80
Wald chi2	48.78	56.37	59.34	75.45	86.1	94.48	60.9	78.46	77.06	100.44	126.79	131.5
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: The asterisk * (**) (***) indicates significance level at the 10%, 5% and 1 % level, respectively. The standard errors are robust to heteroscedasticity.
Note that the alternative independent variables such as Leverage2 are in turn interchangeable to models. The results revealed the same relationship with firm value

Table 4.8: Instrumental variables GMM estimation for cross-sectional models of firm performance

In terms of panel models, the results of *Wald Chi2, Prob > Chi2*, and Hansen test suggest that some models are appropriate and that the problem of endogeneity exists. It is known that Hansen test is used to test the appropriation of instrumental variables in the regression model, Hansen test with H_0 is instrumental variable is exogeneity, meaning that it is uncorrelated with error term of the model, therefore the higher value of P value of Hansen test, the better of the model is. Thus, almost all models showing very good results of Hansen test, but 3 of the 8 models show a very small result for the Hansen test. That means that, in some models, there might be some weak evidence of endogeneity. In terms of the results of the first-order autocorrelation (AR1) and the second-order autocorrelation (AR2), it is shown that there is only evidence of the first-order autocorrelation and no evidence of second-order autocorrelation.

INDEPENDENT VARIABLES	DEPENDENT VARIABLE							
	Firmvalue1	Firmvalue2	Firmvalue1	Firmvalue2	Firmvalue1	Firmvalue2	Firmvalue1	Firmvalue2
	GMM (61)	GMM (62)	GMM (63)	GMM (64)	GMM (65)	GMM (66)	GMM (67)	GMM (68)
CashHolding	0.000	0.125	-0.126	0.010	0.019	0.156	-0.075	0.122
	(0.201)	(0.190)	(0.183)	(0.186)	(0.191)	(0.178)	(0.167)	(0.160)
Debmaturity1			0.004	0.004			0.003	0.003
			(0.003)	(0.003)			(0.003)	(0.003)
Debmaturity2	0.159***	0.176***			0.136**	0.116**		
	(0.057)	(0.058)			(0.060)	(0.057)		
LogAssetsmaturity	0.026	0.061	0.043	0.105***	0.026	0.038	0.040	0.077*
	(0.043)	(0.045)	(0.036)	(0.042)	(0.042)	(0.042)	(0.041)	(0.043)
Dividend1	0.003	0.004	0.004	-0.001	0.010	0.004	0.010	-0.003
	(0.013)	(0.013)	(0.012)	(0.011)	(0.014)	(0.016)	(0.014)	(0.011)
Zscore	0.067***	0.091***	0.080***	0.101***	0.065***	0.096***	0.080***	0.111***
	(0.013)	(0.014)	(0.013)	(0.014)	(0.014)	(0.014)	(0.013)	(0.013)
Leverage1					0.246***	0.679***	0.358***	0.736***
					(0.112)	(0.104)	(0.105)	(0.096)
Leverage2	0.045***	0.064***	0.063***	0.070***				
	(0.017)	(0.019)	(0.016)	(0.018)				
Changshareprice	0.113***	0.077***	0.141***	0.114***	0.118***	0.075***	0.143***	0.111***
	(0.027)	(0.027)	(0.028)	(0.028)	(0.029)	(0.027)	(0.027)	(0.025)
Firmsize	0.057*	0.080***	0.038	0.064***	0.049	0.016	0.032	-0.007
	(0.034)	(0.034)	(0.031)	(0.034)	(0.040)	(0.037)	(0.033)	(0.034)
Constant	5.406	2.208	42.391	16.401	7.124	12.891	50.625	40.011
	(43.918)	(49.548)	(58.084)	(53.104)	(42.982)	(46.494)	(57.623)	(66.561)
Number of Obs	*3962*	*3860*	*3329*	*3272*	*3957*	*3856*	*3329*	*3272*
Wald chi2	*798.4*	*1048.67*	*889.09*	*839.59*	*745.13*	*1012.81*	*822.18*	*1113.89*
Prob > chi2	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
AR (1)	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
AR (2)	*0.67*	*0.528*	*0.681*	*0.986*	*0.673*	*0.589*	*0.771*	*0.938*
Hansen test	*0.163*	*0.458*	*0.313*	*0.557*	*0.172*	*0.309*	*0.167*	*0.415*

Table 4.9: Two-step system GMM estimation for firm performance determinants

The regression results from the GMM models are a bit different from the GLS and FE models. In particular, there is no evidence to confirm a significant relationship between cash holdings and firm performance. Moreover, only one proxy of debt maturity, measured by long-term debt divided by total debt, is found to have a positive impact on firm performance. Meanwhile, the other one is insignificant. The dividend is also confirmed in

the model as it shows no impact on firm performance. For the rest of the variables, similar findings are found that are consistent with almost all previous models.

4.3.6. Discussion

It is strongly believed that there is a positive relationship between managerial overconfidence and firm value, whereby almost all models indicate the same findings. Actually, this conclusion is very different from the expectation and the logic from the literature reviews, where it is believed that managerial overconfidence may lead to failed decisions such as reducing the positive NPV projects (Heaton, 2002), causing unexpected outcomes or wrong predictions for company (March and Shapira, 1987, Langer, 1975, Adam et al., 2015, and Hribar and Yang, 2015) and thus is predicted to have negative impacts on firm value. In terms of cash holdings, the regression results show that cash holdings have a positive impact on firm performance, which is consistent with the conclusions of some prior studies such as Ammanna et al. (3) and Li et al. (2017). For the debt maturity variable, even though there is a small sample size, the regression results show that there is no evidence of the impact of debt maturity on firm performance. However, in the models of the extended sample size and the panel data, the findings are similar to the findings in the studies of Cheung et al. (2015) and Ebaid (2009), which show a positive relationship between debt maturity and firm performance. That means that holding more long-term debt seems to bring more benefits for firms. Therefore, there is still confidence when we confirm that there is a significantly positive impact of debt maturity on firm performance.

In fact, when linking with the regression results from chapter 2 and chapter 3, we can see that there is a basis to see that the regression results in this chapter are reasonable. In chapter 2, the findings indicate that a higher level of managerial overconfidence might lead to a lower level of cash holdings, but the actual cash holdings level is not far from the target cash holding level. Therefore, it might not have a negative effect on firm performance even though cash holdings are found to have a positive impact on firm performance in this study. Furthermore, in chapter 3, overconfident managers are found to tend to hold more long-term debt than short-term debt, hence this might not have any negative effects on firm performance. This statement is also supported by the finding of a relationship between debt maturity and firm performance in this chapter. In this chapter, debt maturity in the models

of the cross-sectional extended sample size and panel data show that the issuing of more long-term debt might help to enhance the firm value. Therefore, overconfident managers tend to hold more long-term debt, and thus might enhance the firm value.

Besides the findings from those three main explanatory variables, the regression models also indicate some other determinants of firm performance. Firstly, in terms of managerial traits, some models show that the older the managers, the better the firm performance results. So, the significant relationship between these two variables might be weak. The finding of this positive association is consistent with the findings in the research of Mohamed et al. (2015) and the same as expectation. Meanwhile, there is no evidence from all the models of small and extended sample sizes to indicate a significant impact between managerial ownership and firm performance. This finding is different from the findings of Mace (1971) and Vancil (1987) and different from the prediction, but similar to the conclusion of Himmelberg et al. (1999).

For other firm-level variables, ownership concentration is found to have a moderately significant relationship with firm performance, whereby half of the models from the small sample size and almost all models in the extended sample size show positive significant relationships with firm performance. This result is the same as the prediction and similar to the findings from a study of Vintila and Gherghina (2014), but different from the study of Lozano et al. (2015), who show a U-shaped relationship between ownership concentration and firm value.

Board size is found to be insignificant for firm performance in the small sample size and in some models of the extended size. But half of the models in the extended sample size show a positive relationship with firm performance. This conclusion is quite different from prior studies, such as Yermack (1996), Lipton and Lorsch (1992), and Zabri et al. (2016), and also different from the expectation. It seems that the number of managers on the board of management is found to be better for firm performance for Vietnamese firms.

In terms of asset maturity, almost all models in the small sample size confirm that there is a negative relationship between asset maturity and firm performance. However, in the extended sample size, the relation seems to be quite weak with just 2 among the 16 models showing negative significant results. This result is inconsistent with the expectation and also shows a weak relationship between asset maturity and firm performance. So, it can be stated that asset maturity might be not a good determinant for firm value.

For Z-score, there is very strong evidence showing that a higher score indicates a better firm performance as all models from all types of data produce very significant results to confirm this finding. This finding is believed reasonable and consistent with the prediction. Z-score can be seen as a very good determinant of firm performance.

In terms of leverage, in a small sample size, there is a weak result as only two models of Leverage1 show a positively significant result. For the second proxy, it is completely insignificant. However, from the rest of all models from both extended sample size and panel data, leverage is shown to have a very strong impact on firm performance. So, we can still confirm that a higher level of leverage might help to boost the value of the firm. This conclusion is similar to the conclusions in studies of Vintila and Gherghina (2014), Mak and Kusnadi (2005), Bae et al. (2011), and also the same as expectation, but different from the papers of Erickson et al. (2005), Faleye (2007), Konijn et al. (2011), Wu (2011), Prambord (2004), Uyar and Kilic (2012), and Connelly et al. (2013).

Similar to leverage, change in share price is shown to have little evidence to confirm the positive impact on firm performance in the small sample size, but the relationship becomes very strong for all the remaining models. This means that we still can state that the increase in the change in share price might enhance the performance of firms. This finding is consistent with the prediction and the study of Bourne et al. (2003).

In terms of firm size, based on the regression results of the small sample size and from the panel data except the models from the GMM method, a strong positive relationship between firm size and firm performance is found, which is similar to the findings of Kuzey et al. (2014), Mak and Kusnadi (2005), Hiraki et al. (2003), and Jiao (2010), but in the extended sample size and the GMM models the impact of firm size on firm value is positively weak.

Finally, regarding dividend, unlike the finding in the study of Jiao (2010) and also different from the expectation, all models in this research indicate that dividend has no relationship with firm performance.

Besides the firm-level control variables, some of the macro variables are also found to indicate a significant impact on firm performance. In fact, these macro variables are constructed based on economic model theory, organizational model theory, and also from some prior studies and are believed to play a very important role in determining firm performance. Accordingly, it is illustrated that when GDP increases, it might help to

enhance firm performance, this finding is consistent with the findings of Beck et al. (2005), Boubakri et al. (2005), and Omran et al. (2008). By contrast, inflation and trade openness showed a negative impact on firm value, which are different from expectations and the findings of Beck et al. (2005), and Boubakri et al. (2005). It seems that a greater level of trade openness is not an advantage for Vietnamese firms in the research period. Regarding industry, similar to predictions, there are differences in term of firm performance among firms in different industries. Accordingly, it can be stated that in the manufacturing industry, the firm performance seems to be higher than in the merchandising and service industries. In addition, there is further evidence showing that merchandisers' performance seems to be lower than others.

Moving to the GMM regression models, for cross-sectional data, there is also a confirmation in terms of the significant relationship between managerial overconfidence and firm value. The regression results from instrumental variables GMM also confirm the significant impact of cash holdings, debt maturity, manager's age and Zscore for firm value. For the panel models, even though not all models suggest the existence of an endogeneity problem in the models, the majority of models indicate that there is the problem of endogeneity. After running the GMM models, it is found that cash holdings and the first proxy of debt maturity have no relationship with firm performance, while the second proxy of debt maturity is demonstrated as having a positive impact on firm performance. For the other control variables, the findings are similar to previous tests.

4.4. Conclusion

Firm value is seen as one of the most important concerns in corporate management. From the traditional theory of financial management, maximizing firm value is the most important objective of firms. Therefore, investigating the determinants of firm value is also the target of many researchers and managers. Through carefully examining the factors that affect firm value, the target of maximizing firm value might become easier. In fact, after reviewing the relevant literature, it can be seen that there a wide range of determinants of firm value has been identified, from micro factors to macro factors. Therefore, it is not easier to find a gap in this area. However, recently, the aspect of managerial attributes is often mentioned in some aspects of the corporate management field. Drawing on this idea, this study seeks to see if there is any gap in terms of managerial overconfidence and its impact on firm performance. The overconfident manager is considered to make more

confident and aggressive decisions than non-overconfident managers and hence might cause risky and unexpected outcomes. Following that, we think that firms with overconfident managers might have some bad results in firm performance. Hence, we attempt to focus on this idea to do the research. Ideally, we find that it can be novel to examine the impact of managerial overconfidence on firm performance by using a very new measurement of managerial overconfidence that no study has used so far. Finally, a new measurement of managerial overconfidence is found, namely through the analysis of the manager's voice pitch. It is believed that this measurement is novel and brings a significant contribution to the research foundations. Furthermore, to avoid bias in the empirical results, the study also uses two more measurements suggested from prior studies, namely the gender of managers and the size of managers' photos on annual reports to recheck the empirical results from the model using voice pitch. From three different proxies of managerial overconfidence, two different research objects are studied, namely top-line managers from interviews and CEOs from collecting data of managers' gender and from the visibility of photos in annual reports. The use of two different types of research objects aims to minimize the bias in the regression results.

Besides the main purpose of investigating the impact of managerial overconfidence on firm performance, this chapter also attempts to find the impact of cash holdings and debt maturity on firm performance, and then find the indirect impact of managerial overconfidence on firm performance through its impact on cash holdings and on debt maturity.

In order to collect the data of managers' voice pitch to measure overconfidence, 123 interviews with top-line managers of Vietnamese listed firms are collected. After collecting the data from interviews, the first group of data are set up for a small sample size with the data of 123 firms. The second type of sample size is the extended sample size, expanding to all 648 firms. The extended sample size is collected based on the two other measurements of managerial overconfidence. In fact, the data of CEOs' gender and CEOs' photos are available from firms' annual reports. Hence, the second type of sample size can be a retest for the main regression results of the voice pitch model.

After running all empirical models, it is found that there is a positive relationship between managerial overconfidence and firm value. This finding is seen as very strong and reliable as almost all different models with different proxies for managerial overconfidence from

both the small and extended sample size produce similar results. Furthermore, in terms of cash holdings and debt maturity, the regression results show that both cash holdings and debt maturity have a positive impact on firm performance.

Moreover, associating with the regression results from chapter 2 and chapter 3, there is a supporting explanation for the positive relationship between managerial overconfidence and firm value. Specifically, in chapter 2, the results show that the greater the level of managerial overconfidence, the lower the level of cash holdings, but the actual cash holdings level is not far from the target cash holding level. Thus, it might not have a negative effect on firm performance, and cash holdings are found to have a positive impact on firm performance in this study. Furthermore, in chapter 3, overconfident managers are shown to prefer to hold more long-term debt than short-term debt, hence this might not lead to any negative effects on firm performance, and, especially, it is found in this chapter that issuing more long-term debt might help to enhance the firm value. Therefore, overconfident managers tend to hold more long-term debt, which might help to increase firm performance.

Besides the main findings in terms of managerial overconfidence, cash holdings and debt maturity, this study also finds a number of different determinants of firm value that are fairly consistent with prior studies from the literature review. Specifically, in terms of managerial traits, it is shown that there is a moderately positive relationship between managers' age and firm performance. Meanwhile, there is no evidence indicating a significant impact between managerial ownership and firm performance. Regarding the firm-level variables, ownership concentration is found to have a moderately significant relationship with firm performance, while board size is shown to have a weak positive relationship with firm performance. In terms of asset maturity, it is confirmed that there is a negative relationship between asset maturity and firm performance. For Z-score, leverage, change in share price, and firm size, their relationships with firm performance are significantly positive. Meanwhile, there is no evidence suggesting an association between dividend and firm performance. Additionally, GDP, inflation, trade openness and industry are also demonstrated as strongly impacting on firm performance besides some firm-level variables.

By using GMM to address the problem of endogeneity for both cross-sectional data and panel data, there are some different regression results, however the most important

variables such as overconfidence, cash holdings and debt maturity are still confirmed by almost all models that they have a significant relationship with firm value.

To sum up, the contributions of this study includes, firstly, the investigation of the impact of overconfident managers on firm value, secondly, the introduction of a new measurement of managerial overconfidence by using voice pitch and the comprehensive index, thirdly, investigating the indirect impact of managerial overconfidence on firm value through examining its impact on cash holdings and debt maturity, fourthly, the use of two different research subjects, namely top-line managers and CEOs, and two different sample sizes to avoid bias in the empirical results, and finally, the targeted market is the Vietnamese market.

Additionally, the findings from our research also suggest that managerial overconfidence might not bring negative impacts on firm value. However, managerial overconfidence has significant relationship with cash holdings, and debt maturity. Further, cash holdings and debt maturity is also found having a significant effect on firm value. Hence, firm's owners should be more careful in appointing managers and firms with overconfident managers should be also more careful in deciding cash holding and debt maturity policies. Any aggressive decisions might bring negative impacts on firms.

Further studies can base on our research to extend to other aspects in financial management, or use different proxies of managerial overconfidence to confirm the relationship between managerial overconfidence and firm value.

CHAPTER 5: CONCLUSION

5.1. Overview

Financial management is one of the most important aspects of corporate management and maximizing firm value is the most important target of any firm. We can say that managers are those who affect the management of firms the most. Therefore, investigating the behaviours of managers can help to improve and enhance the firm's management results. Recently, there have been a number of studies indicating the impact of managerial overconfidence on some aspects of corporate finance. Stemming from this idea, this study develops and expands the research to investigate the effect of managerial overconfidence on some new aspects of corporate management. Throughout the literature reviews, we find that the investigation of managerial overconfidence on cash holdings, debt maturity, and firm performance can be a significant contribution to the research area and also the management area. Combining this with a new measurement for managerial overconfidence, the thesis is believed to be novel research.

The findings of many recent studies state that managerial overconfidence is one of the most important traits of managers, as it has a significant influence on corporate management. It is believed that managerial overconfidence is associated with the failure of the operating results of firms, unexpected outcomes for investments, and high volatility of free cash flows as these managers tend to misjudge their abilities, knowledge, and predictions. Relating to cash holdings, debt maturity, and firm performance, it is also predicted that overconfident managers might have more aggressive decisions compared to their non-overconfident counterparts, such as holding too little cash for investment purposes or the use of more short-term debt to lower the cost of using debt, and thus might lead to a bad result in firm performance. Among all relevant aspects of corporate management, cash holdings, debt maturity, and firm performance are three of the most important aspects of corporate management. According to cash holdings' theory, holding cash helps firms to meet the needs of precautious motives, transaction motives and speculation motives. In fact, cash is necessary for daily transactions such as everyday expenses, due date payables, sudden investment opportunities, or unexpected events. Furthermore, the holding of cash is also described from the study of Keynes (1936) as having two advantages, namely lower transaction cost from using internal capital sources and avoiding risks from unexpected contingencies. In general, we can recognize the importance of holding cash; however, to

determine the optimal level of cash holdings remains a difficult question. This is because holding too much cash can be good to make sure meeting all needs of cash holding purpose, but holding less cash might be risky for firms when firms do not have enough cash for everyday transactions, lose speculation opportunities or even put themselves under risks from unexpected events. Therefore, it is necessary to know what determines the cash holdings and also the optimal level of cash holdings. Regarding decisions of debt maturity, the choice of debt maturity can help firms effectively manage their borrowing sources to match with their purposes, then maximize firms' profit by minimizing the cost of debt. Debt is one of the very important capital sources of firms. Even though it is stated that the cost of using debt might be higher from transaction costs and information asymmetry costs compared to the cost of using retained earnings or internal sources, it also helps firms create more net income from the advantage of the tax shield. In addition, cost of debt is also reduced by using more short-term debt as the cost of short-term debt is normally lower than long-term debt and short-term debt also helps to reduce the cost by reducing the agency costs (Myers, 1977, Barnea et al., 1980). However, the use of long-term debt also has its own advantages, such as a longer borrowing term, thus it can be safer, which avoids the difficulty of renewing debts due to the problem of asymmetric information (Goswami et al., 1995, Guedes and Opler, 1996). It can be seen that each type of debt maturity has its own benefit; hence, examining the determinants of debt maturity is necessary. In terms of firm performance, it can be seen that the final purpose of firms is to maximize the firm value or maximize the firm performance result, and all corporate decisions are believed to dramatically affect firm performance. Therefore, decisions concerning cash holdings and debt maturity are closely associated with firm performance. Furthermore, the investigation of the determinants of firm performance such as managerial overconfidence can provide a better look at how this drives firm performance, which helps researchers, managers and also policymakers have more knowledge and experience in managing corporate operations.

Generally, cash holdings, debt maturity and firm value are key aspects of corporate management. Investigating the new determinants of those aspects plays an important role for researchers, managers and also policymakers. Throughout the relevant literature review, managerial overconfidence has been one of the novel determinants of cash holdings, debt maturity and firm performance. Based on the nature of overconfidence, it is predicted that managerial overconfidence might be associated with a lower level of cash holdings, a

higher deviation from the actual level of cash holdings and optimal cash holdings level, more short-term debt, higher deviation from the optimal level of debt maturity, and worse results of firm performance. However, very interestingly, the empirical results represent very different outcomes compared to the expectations. The regression results indicate that overconfident managers tend to hold less cash, but the actual level of cash holdings is not far from the target level of cash holdings, which means that managerial overconfidence does not associate with a higher deviation from the target cash holdings level. For debt maturity, overconfident managers tend to hold more long-term debt and cause a higher deviation from the target debt maturity level. Lastly, managerial overconfidence is illustrated to not cause worse results in firm performance in this study.

To conduct the study, Vietnamese listed firms were chosen as the research objects. To measure managerial overconfidence, 123 face-to-face interviews with top-line managers of Vietnamese listed firms were conducted and recorded. After that, the voice pitches of managers were analysed to identify the level of overconfidence. Voice pitch is seen as a new measure for managerial overconfidence, which makes the research become novel among the research field. Besides that, a number of different measures have been derived from prior studies, namely the psychometric test, bias in earning forecast, CEOs' gender, the visibility of CEOs' photographs on annual firms' annual reports, and the comprehensive index, which are also used in this study to avoid bias in the regression results if they were based on only the one result of voice pitch. Those measurements are in turn used in each empirical chapter when the measure is appropriate in the empirical model of each chapter. Accordingly, in the cash holding chapter, all six measurements of managerial overconfidence are used and produce consistent results with each other. For the chapter of debt maturity, only three fitted measurements are used, namely the voice pitch, the visibility of CEOs' photos in annual reports and the comprehensive index combined from voice pitch and the visibility if CEOs' photos. For the last empirical chapter, four suitable measures are used, namely the managers' voice pitch, the visibility of CEOs' photos, CEOs' gender, and also the comprehensive index constructed from prior used overconfidence proxies.

Based on the availability of each proxy for managerial overconfidence, two types of data are identified to test the impact of managerial overconfidence on each research topic. Firstly, there is the data type based on 123 interviews with top-line managers, which means

the cross-sectional data from the year 2016 is called the sub-sample size. Secondly, the other data type is based on one of the proxies for managerial overconfidence, that is, the bias in earning forecast available from firms' annual reports. Therefore, we have an extended sample size from the whole population, which means that all 648 non-financial listed firms are considered. The second data type is also a kind of cross-sectional data. As the main purpose of the thesis is to examine the relationship between managerial overconfidence and cash holdings, debt maturity and firm performance, the panel data of all listed firms from 2005 to 2016 are also investigated to test the determinants of cash holdings, debt maturity and firm performance with the general control variables.

The reason for choosing Vietnam to conduct the research is that Vietnam is a developing market, and thus might have more different and new characteristics compared to other markets, especially developed markets. Furthermore, there have been not many studies focusing on Vietnam. Therefore, we expect to find a number of significant results in this study. The economy of Vietnam has recently been shown to have remarkable numbers, such as the real GDP growing at an average rate of between 6% and 7% per year since 2000 and increasing to double after only nearly 2 decades from 2000 to 2018 (WB and GSO, 2018). And the growth rate of real GDP is still forecasted to increase dramatically in the next five years. It can be seen that the good signs of economic growth show a very good environment for the growth and development of the business sector and, vice versa, business sectors are also the main engine of economic growth and development in Vietnam. In terms of the stock exchange market, there are two stock exchange markets in Vietnam, namely the Ho Chi Minh City Stock Exchange (HOSE) and the Hanoi Stock Exchange (HNX). HOSE was the first stock exchange established in 2005, while HNX started in 2010. The total number of the listed firms until 2016 is about 739 firms, including both financial and non-financial firms, with 354 firms in HOSE and 385 firms in HNX.

For the research objects, the 123 non-financial listed firms are combined from both HNX and HOSE, while the whole population are based on all 648 non-financial listed firms from the two stock exchange markets of Vietnam.

The following parts summarize the research purposes and the results of each empirical chapter.

5.2. Research purposes

This study attempts to investigate the impact of managerial overconfidence on cash

holdings, debt maturity and firm value. Moreover, extended studies are also conducted aimed at examining the effect of managerial overconfidence on the deviation between the actual level of cash holdings and the target level of cash holding, and the deviation between the actual level of debt maturity and the optimal level of this aspect. Furthermore, in the last empirical chapter, besides the main investigation for the direct impact of managerial overconfidence on firm performance, the study also examines the indirect effect of managerial overconfidence on firm performance through its effect on cash holdings and debt maturity and then the influence of cash holdings and debt maturity on firm performance.

After finding a relationship between managerial overconfidence and the three research aspects, in the final part of each empirical chapter, the panel data of all non-financial firms are also employed to examine the determinants of cash holdings, debt maturity and firm performance with the general control variables.

5.3. Managerial overconfidence and cash holdings

The choice of cash holding level plays a very important role in financial management. Holding cash helps to maintain the safe condition for firms and ensures they can meet all necessary daily transactions, including expenses from unexpected events. However, too much cash held in the firm might also be a disadvantage as no more added value of money can be created from a large amount of cash held. Stemming from those characteristics of cash holdings, a number of determinants of cash holdings are found from prior studies. Recently, managerial overconfidence has also been mentioned as significantly affecting some aspects of corporate management. Combining the idea of attempting to find a new determinant of cash holdings and the influence of managerial overconfidence on corporate management, the study focuses on investigating the impact of managerial overconfidence on cash holdings and also on the deviation between the actual cash holding level and the target cash holding level. Overconfidence is the term referring to people who normally misjudge themselves, overestimate surrounding events and tend to make wrong predictions. Therefore, overconfident managers are believed to make more risky decisions than non-overconfident managers and hence might lead to some unexpected outcomes for firms. Risky decisions and unexpected events in the case of cash holdings, debt maturity and firm performance can be a lower level of cash held, more short-term debt, and worse results of firm performance.

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In terms of measurement of managerial overconfidence, it is mainly measured through the analysis of managers' voice pitch, which is believed to make the thesis unique and novel among research studies. The voice pitches of managers were collected from 123 face-to-face with top-line managers of non-financial Vietnamese listed firms. In order to get approval for interviews with top-line managers, a number of contact methods were used, including sending consent emails, direct phone calls, and directly asking at public meetings. Finally, 123 interviews were conducted, recorded and processed from two periods, one was from February to May 2017 with 79 interviews were conducted and the other was from October 2017 to February 2018 with the rest of 44 interviews were conducted. Besides the use of voice pitch to measure overconfidence levels, the study also uses other measures suggested from prior studies to retest the regression results from the empirical model with voice pitch. Those measures are the psychometric test, the bias in earnings forecast, CEOs' gender and CEOs' photographs appearing on firm annual reports. For the psychometric test, similar to voice pitch, this data type was collected through the interviews with managers. For the interviews, two kinds of group questions were designed. The first group is open-ended questions aimed to get long answers from interviewees to collect the voices of managers. The second group of questions were closed-ended questions aimed at testing the overconfidence level of interviewees through a number of psychometric questions. The data from both voice pitch and psychometric tests create a sub-sample size for the research. The year data for all necessary variables used to run the regression for the cross-sectional data is 2016, even though the interviews were conducted in 2017 and 2018, as all interviewed managers worked in firms for at least half of a year if the interviews were conducted in 2017 and at least one and a half years if the interviews were conducted in 2018, so using other necessary data from 2016 is suitable. The second data type is the extended sample size with all 648 non-financial Vietnamese listed firms, which were developed based on one of the different proxies of managerial overconfidence, namely the bias in earnings forecast. Among all proxies of managerial overconfidence, except voice pitch, firstly, in terms of bias in earnings forecast, the data is based on the forecast of the board management in the two years 2015 and 2016 and is available from firms' annual reports. Based on the data of two years, the average bias from those two years are identified; if there is a negative bias calculated from the deduction between the actual earnings and forecasted earnings, then overconfident managers are identified if they have a negative bias.

Regarding managers' gender, the managers' gender is the gender of all interviewed managers. For the visibility of CEOs' photographs, these are easy to find in firms' annual reports. The use of different proxies of managerial overconfidence with different research objects such as top-line managers from interviews, the whole board of managers and CEOs aims at strengthening the empirical results when they produce consistent results.

Based on the two types of data, including cross-sectional sub-sample size, cross-sectional extended sample size and panel data for general case of the determinants of cash holdings, this chapter uses the OLS, GLS and instrumental variables GMM methods to test the impact of managerial overconfidence on cash holdings and on the deviation between the actual level of cash holdings and the target level of cash holdings for cross-sectional data. For the panel data, the GLS, FE and GMM methods are used to confirm the determinants of cash holdings. The purpose of using GMM is to address the problem of endogeneity in the models.

The regression results from the sub-sample show that managerial overconfidence is negatively associated with cash holdings. That means that overconfident managers tend to hold less cash. This finding is consistent with the expectation and can be seen as a strong and confident result as all proxies for managerial overconfidence indicate the same results for both the OLS and GLS regressions. Furthermore, almost all coefficients of managerial overconfidence in all models are significant at the 5% and 1% levels, while only one is shown to have a 10% significance level among the 10 models. These results are also consistent with suggestions from prior studies, such as in the research of Huang-Meier et al. (2016), Deshmukh et al. (2010, 2013), and Huang-Meier et al. (2016). Besides the use of different proxies for the main explanatory variables, several control variables also have alternative measurements, such as firm value, and leverage. The models of those different proxies also produce the same results for the relationship between cash holdings and managerial overconfidence.

Besides finding out a negative relationship between managerial overconfidence and cash holdings, the finding from the second research hypothesis in terms of investigating the impact of managerial overconfidence and the deviation between the actual cash holding level and the optimal cash holding level shows that a relationship is also found. It is illustrated that managerial overconfidence negatively impacts on the deviation between the actual level and the optimal level of cash holdings. The results are confirmed throughout

almost all different proxies for managerial overconfidence at the 1% and 5% significance levels, only except the proxy from the psychometric test. Only one proxy of managerial overconfidence shows no relationship between these two terms, which might be not a problem when all four other proxies produce similar results. This result is very different compared to the prediction. The prediction forecasts that managerial overconfidence might cause a higher deviation between the actual level and the target level of cash holdings. However, the empirical result indicates a contrary result as it indicates that overconfident managers are associated with a lower deviation between the actual level and the target level of cash holdings.

To strengthen the regression results for the sub-sample size, the same models in the extended sample size are also run with the use of bias in earnings forecast representing managerial overconfidence. After the regression, the consistent results are produced the same as in the models of sub-sample size. That means that managerial overconfident negatively impacts on cash holdings and also negatively impacts on the deviation between the actual cash holding level and the optimal cash holding level. The results are very strong results whereby all of the results from all different models are indicated to be significant at the 1% level.

From the regression results of the sub-sample size and the extended sample size, it is strongly believed that managerial overconfidence has negative relationships with cash holdings and also with the deviation between the actual cash holding level and the targeted cash holding level.

Besides the findings of the relationship between managerial overconfidence with cash holdings and the deviation, the study also finds other determinants of cash holdings and deviation. Regarding the other determinants of cash holdings, all models from the sub-sample size and extended sample size illustrate that there is no relationship between duality and manager's ownership with cash holdings. The finding for duality is similar to the finding of Ozkan and Ozkan (2004), who found no relationship between these two variables. However, it is different from the findings of Liu et al. (2014) and Opler et al. (1999) in terms of manager's ownership, who stated that management ownership has a positive impact on cash holdings. In terms of tenure and manager's education, it seems that there are weak relationships between these variables and cash holdings whereby for the sub-sample size, it is found that there is no evidence to suggest a relationship between these

variables and cash holdings. However, for the extended sample size, the regression results indicate that both tenure and manager's education have a significant relationship with cash holdings, whereby tenure negatively impacts on cash holdings and managers' education positively impacts on cash holdings. The results of tenure, in this case, are consistent with the findings of Liu et al. (2014). Only managerial age is identified as having both positive and negative effects on cash holdings in both the sub-sample size and extended size.

Regarding the other control variables, except dividend and firm quality, all other control variables are proved to have a significant impact on cash holdings, which is similar to other studies of Kim et al. (1998), Schnure (1998), Opler et al. (1999), Faulkender (2002), Omet and Maghyereh (2003), Bigelli and Sánchez-Vidal (2012) and Liu et al. (2014). The result from Z-score is similar to the study of Faulkender (2000) and Faulkender (2002), who stated that riskier firms tend to hold more cash. Opler et al. (1999) demonstrated that firms that pay dividends hold less cash; however, the findings in this study are different whereby also models from the sub-sample size, extended sample size and panel with GLS and FE show that there is no relationship between dividend and cash holdings. This finding is also different from the studies of Lins et al. (2010), Basil (2013) and Bigelli and Sánchez-Vidal (2012), whereby they state that there is a positive relationship between dividends and cash holdings.

To address the problem of endogeneity in the panel data, the GMM method shows quite similar results with the GLS and FE regressions. Specifically, for all models with different proxies of control variables, it is found that dividend, Z-score, leverage, firm size, firm quality and profitability significantly impact on cash holdings, whereby dividend, Z-score, firm size and profitability are illustrated as having positive relationships with cash holding, while leverage and firm quality are suggested leading to a negative effect on cash holdings. Those results are consistent with the GLS and FE estimations in terms of Z-score, firm size, profitability, and leverage. Except for dividend and firm quality, which are illustrated as having no impact on cash holdings, firm value and intangible are indicated as having a significant impact on cash holdings in the GLS and FE regressions, but they are different from the results of the GMM regression. Additionally, the GMM method also demonstrates that there is a positive significant difference between cash holdings at time t-1 and cash holdings at time t.

Regarding the models of deviation, all variables of managers' traits are illustrated as having a significant impact on deviation. These results are the first results in the study of the relationship between manager's traits and the deviation between the actual cash level and the optimal level of cash holdings. Therefore, this is a premise for future researches in this field.

All of the models from all three types of data are represented with very good results in terms of *Pro>F, Wald Chi2, Pro>Chi2* and Hansen test. The results show that all constructed models are appropriate and confident. The results from the VIF and regression results from the GLS models also state that there are no problems of multicollinearity and heteroscedasticity in the models.

5.4. Managerial overconfidence and debt maturity

The choice of debt maturity is one of the important decisions in corporate management. Short-term debt is believed to be more effective than long-term debt because it helps to minimize the adverse selection costs and agency costs from the problem of information asymmetry and agency conflicts (Myers, 1977, Barnea et al., 1980, and Mitchell, 1991). However, some argue that by taking advantage of tax shield, the use of long-term debt can help to enhance a firm's value (Brick and Ravid, 1985). In the study of Flannery (1986), he illustrates both sides of using short-term debt. Accordingly, short-term debt might be costly as more transactions are created each time debts are reissued, but this also helps to reduce the cost of capital because the cost of short-term debt is normally cheaper than the long-term debt. In fact, each type of debt maturity has its own advantages; however, it seems that firms might save more cost if they prefer using short-term debt. From this statement, we believe that managerial overconfidence might also prefer using short-term debt over long-term debt. We know that overconfident managers tend to make more risky and aggressive decisions than their non-overconfident counterparts. Therefore, if the use of short-term debt can help the firm save more money and create higher profit, it obviously attracts overconfident managers. Based on this idea, the study attempts to test the impact of managerial overconfidence on debt maturity and find out whether or not overconfident managers tend to prefer more short-term debt. Besides that, the study of this section also attempts to investigate the effect of managerial overconfidence on the deviation between the actual level of debt maturity and the optimal level of debt maturity. It is predicted that the relationship between managerial overconfidence and this deviation level is negative.

Due to the nascent history of the Vietnamese security market and the capital market, especially the debt market still mostly relies on commercial banks. Therefore, most of the borrowing sources of firms are commercial banks. Even though the bond market is recorded as having a total outstanding volume of 24.13% of GDP in 2015, most of these are government bonds, which account for 85% to 87%. This characteristic might obviously affect the choice of debt maturity for firms. However, we still set up the hypotheses of managerial overconfidence having a negative impact on debt maturity and having a positive effect on the deviation between the actual level of debt maturity and the targeted level of debt maturity.

Similar to the database from the empirical chapter on cash holdings, 123 direct interviews with top-line of Vietnamese non-financial listed firms and also the population of 628 non-financial listed firms are used for the study of debt maturity. In terms of managerial overconfidence measurements, two measures are found to be appropriate in this chapter, namely the voice pitch and the visibility of the CEO's photographs in annual reports. Voice pitch was collected from 123 interviews with top-line managers, hence creating the sub-sample size for the study. Secondly, with the availability of all firms' annual reports, CEOs' photographs are easy to be obtained from annual reports. Hence, we have the second data type, named the extended sample size, with all 648 non-financial listed firms. Similar to the chapter on cash holdings, those two types of data are in turn used to run the regression analysis and find out the impact of managerial overconfidence on debt maturity and also the effect of managerial overconfidence on the deviation between the actual level of debt maturity and the optimal level of debt maturity. Furthermore, panel data is also analysed with regression to check the determinants of debt maturity for all control variables. In the panel data, there is a further test whereby all firms are divided into two groups following their financial situations. Accordingly, one group is financially constrained firms and the other one is financially unconstrained firms. The reason for dividing all firms into two groups is that debt maturity can be affected by the financial situation of the firm. Hence, by dividing firms into two groups, the study attempts to find out whether there is a difference in terms of the determinants of debt maturity between two groups.

In the chapter on debt maturity, for the cross-sectional sub-sample size and cross-sectional extended sample size, the OLS, GLS and instrumental variables GMM methods are used to

run the regression. For the panel data, FE, GLS and GMM are used to investigate the determinants of debt maturity, whereby GMM is used to address the problem of endogeneity. In terms of debt maturity proxies, there are two proxies, which are firstly measured by long-term debt divided by short-term debt and secondly measured by long-term debt divided by total debt.

The findings from the subsample size indicate that managerial overconfidence is associated with the preference for using long-term debt. This finding is quite different from the expectation and suggestions from prior studies. Both proxies of managerial overconfidence produced similar results. However, the relationship between managerial overconfidence and debt maturity, in this case, is not a very strong result as they are all just significant at 10% level and one of the four models does not support the others as it has an insignificant coefficient. The findings are found to be similar in the extended sample size. In the extended sample size, it is also found that there is a positive relationship between managerial overconfidence and debt maturity with the support of both models for the different proxies for debt maturity. These results from the extended sample size seem to be stronger whereby, both of the models are significant at 5% and 10% levels. This finding can be explained by the characteristics of the Vietnamese security market and the reliance on the banking system of the debt market. That means that it is not easy for firms to access the bond market to finance needed capital, and once they can access bank debt, they might prefer to use long-term debt. Moreover, most of the interviewees answered that the choice of debt maturity depends on the maturity of assets and investments. Therefore, we can state that in the case of overconfident managers, they still prefer choosing long-term debt instead of short-term debt in the capital structure. Besides the finding for the effect of managerial overconfidence on debt maturity, manager's age is also illustrated as positively impacting debt maturity for all models in both the sub-sample size and extended sample size. That means that the preference for using short-term debt is more common in younger managers. This finding is similar to the prediction. For other managers' attributes, such as duality, gender, and education, there is no evidence to confirm the association between these variables with debt maturity. In terms of the ownership aspect, for the variable of ownership concentration, foreign ownership and state ownership, it is shown that there are positive relationships between these variables and managerial overconfidence. These results are consistent with most of the prior studies and the prediction.

In terms of the other control variables, all were found to significantly impact on debt maturity, but some variables are illustrated with very strong impacts and others are shown with weak impacts. Specifically, the group of strong determinants of debt maturity includes liquidity, asset maturity, and leverage. For those variables, almost all models from the sub-sample size and the extended sample size and panel data show similar results. The regression results indicate that liquidity, asset maturity, and leverage have a positive relationship with debt maturity. For the weak group, dividend and profitability are shown to have a negative impact on debt maturity, but just in few models. Similar to the weak relationship with debt maturity, intangible assets are also shown in a few models to have a positive effect on debt maturity. However, the evidence from the GMM models is a bit different compared to the FE and GLS regressions. Specifically, in terms of asset maturity, other models suggest a significant relationship between asset maturity and debt maturity, but in GMM, there is no evidence to support this relationship. Regarding the two groups of financially constrained and financially unconstrained, even when all firms are divided into two, almost all variables are illustrated as having the same impacts on debt maturity compared to the other models, and there is no difference between the groups.

Regarding the investigation into the impact of managerial overconfidence on the deviation between the actual level of debt maturity and the optimal level of debt maturity, both the results from the sub-sample size and the extended sample size support the evidence that there is a positive relationship between managerial overconfidence and the deviation between the actual level of debt maturity and the optimal level of debt maturity. However, in the sub-sample size, the significant results are just demonstrated for the first proxy for debt maturity. That means that only when debt maturity is measured by long-term debt divided by short-term debt, is managerial overconfidence illustrated as having a positive effect on the deviation. Similarly, in the extended sample size, it is only supported for the first proxy for debt maturity, but for the second one, it is significant. So, we can state that there is a weak positive relationship between managerial overconfidence and the deviation between the actual level of debt maturity and the optimal level of debt maturity. The finding of the positive relationship between these two terms is the same as the expectation. Besides that, the findings from all models of the second hypothesis also show that there is little evidence indicating the significant impacts of manager's gender, duality, manager's age, ownership concentration, state ownership, liquidity, asset maturity, dividend, leverage,

profitability, intangible assets and firm age on the deviation between the actual level of debt maturity and the optimal level of debt maturity. However, those relationships are shown with less evidence, so they are not strong results.

5.5. Managerial overconfidence, cash holdings, debt maturity and firm performance

One of the most important objectives of the firm is maximizing the firm's value. Therefore, investigating the determinants of firm performance is always one of the most attractive topics. In fact, maximizing the firm's value depends on many relevant aspects of corporate management, especially management decisions made by managers. It can be seen that the success of firms depends a lot on the managers. Recent studies have mentioned that some manager's traits can affect corporate management, such as manager's age, education, duality, gender, and overconfidence. Stemming from these ideas, we attempt to investigate the impact of managerial overconfidence on firm performance. Besides the other manager's traits, the manager's age is also examined in the relationship with firm performance.

As described above, managerial overconfidence refers to managers who normally misjudge themselves and might make more risky and aggressive decisions than non-overconfident peers. Therefore, this might cause unexpected results in corporate management. Those unexpected results can be a worse firm performance or a decrease in a firm's value. Hence, another purpose of this thesis is to find out the impact of managerial overconfidence on firm performance. It is predicted that managerial overconfidence is associated with a decrease in firm performance. Besides that, the indirect impact of managerial overconfidence on firm performance is also examined carefully in this study. In more detail, from the findings of chapter 2 and chapter 3, through the effect of managerial overconfidence on cash holdings and debt maturity, firm performance might also be affected by cash holdings and debt maturity.

Managerial overconfidence in the chapter on firm performance is measured in three ways, namely voice pitch analysis, gender of managers and the visibility of CEOs' photographs in annual reports. Based on the availability of managerial overconfidence proxies, there are two main types of data used to run the regression to test the impact of managerial overconfidence on firm performance. Firstly, there is the sub-sample size for voice pitch collected from interviews with top-line managers of non-financial listed firms. Further, the genders of top-line managers are also collected through the interviews; hence they are also used as another proxy of managerial overconfidence in this chapter. Secondly, there is the

extended sample size for all 648 non-financial listed firms. From this data type, the genders of CEOs and the visibility of CEOs' photographs are available from firms' annual reports, thus CEOs' gender and CEOs' photographs are used as other proxies for managerial overconfidence in the extended sample size.

Moreover, the panel data is also used to examine the determinants of firm performance for the other control variables in the main research models. Based on the theory of firm performance, firm performance might be impacted by three groups of factors, namely organizational factors, environmental factors and people factors. Therefore, there is also an expansion for the model in the panel data. The expansion model is the addition of some macro variables, such as GDP, inflation, the trade openness of the country and industry characteristics.

Similar to the methodology used in the chapter on cash holdings and debt maturity, for the cross-sectional sub-sample size and cross-sectional extended sample size, OLS, GLS, and instrumental variables GMM methods are used to test the relationship between managerial overconfidence and firm performance. These also find an impact of cash holdings and debt maturity on firm performance. For the panel data, GLS, FE and GMM are used, whereby GMM is used to address the problem of endogeneity.

The findings from the sub-sample size and extended sample size indicate that managerial overconfidence has a positive impact on firm performance. This result can be seen as a quite strong result as all models for the first proxy for managerial overconfidence-voice pitch show similarly significant results at the 1% and 5% significance levels in the relationship with firm performance represented by both Tobin Q and market to book value. For the proxy of managers' gender, only three models among the 16 models from the sub-sample size showed insignificant results. Meanwhile, in the extended sample size, CEO gender strongly supports the significant impact on firm performance for both proxies of firm performance. The finding of a positive impact of managerial overconfidence on firm performance is very different from the expectation and suggestions of prior studies. However, it might be consistent with the findings from chapter 2 and chapter 3, where overconfident managers are found to prefer to hold less cash but not too far from the target level of cash holdings and are found to prefer to use long-term debt, which might not lead to worse firm performance. In particular, it is found that cash holdings and debt maturity have a positive impact on firm performance in the regression models of chapter 4, even

though the relationship between cash holdings and debt maturity and firm performance is just at a moderate level as not all models support a significant relationship. Specifically, in models of the sub-sample size, there is some evidence from 10 of the 16 models showing cash holdings have a significant impact on firm performance, while there is no evidence showing a significant relationship between debt maturity and firm performance. In contrast, from the extended sample size models and GMM models, cash holdings are illustrated as having no effect on firm performance. However, the positive relationship between cash holdings and firm performance is very supported by the models from FE and GLS of the panel data, especially in the expansion models with macro variables of the panel data. Meanwhile, for debt maturity, almost all remaining models indicate that debt maturity has a significant impact on firm performance. Therefore, we can state that cash holdings and debt maturity play a very important role in determining firm performance.

For the other manager's traits, from the models of both the sub-sample size and extended sample size, manager's age is demonstrated as having a weak positive relationship with firm performance. This finding is consistent with the expectation and findings from prior studies such as Mohamed et al. (2015). By contrast, managerial ownership is shown as having no association with firm performance. This result is different from the expectation and some other studies, such as Mace (1971) and Vancil (1987). But it is similar to the findings of Himmelberg et al. (1999).

For the firm-level variables from the sub-sample size and extended sample size, firstly, regarding ownership concentration, the result indicates that there is a moderately significant relationship with firm performance as half of the models from the small sample size and almost all models in the extended sample size show positive significant results. This result is the same as the prediction and similar to the findings of Vintila and Gherghina (2014), but different from the study of Lozano et al. (2016). About board size, there is a weak positive relationship between board size and firm performance whereby just about one-third of all models support a significant relationship.

In terms of the other control variables, asset maturity is suggested as having a weak negative impact on firm performance. For Z-score, there is very strong evidence showing that a higher score indicates a better firm performance as all models from all types of data produce very significant results to confirm this finding. In terms of leverage, in the small sample size, there is a weak result as only two models of Leverage1 show a positively

significant result, while for the second proxy of leverage, it is totally insignificant. However, from the rest of all models from both the extended sample size and panel data, leverage is shown to have a very strong impact on firm performance. Similar to leverage, changes in share price are shown with little evidence to confirm their positive impact on firm performance from the small sample size, but the relationship becomes very strong for all the remaining models. In terms of firm size, from the regression results of the small sample size and from the panel data, there is a strong positive relationship between firm size and firm performance. Finally, regarding dividend, all models indicate that dividend has no relationship with firm performance. Besides firm-level control variables, some of the macro variables are also found to indicate a significant impact on firm performance. Accordingly, it is illustrated that when GDP increases, it might help to enhance firm performance. By contrast, inflation and trade openness show a negative impact on firm value. Regarding industry, it can be stated that in the manufacturing industry, the firm performance seems to be higher than in the merchandising and service industries. In addition, there is further evidence also shows that merchandisers' performance seems to be lower than that of others.

5.6. Conclusion

In conclusion, we can state that managerial overconfidence plays a very vital role in corporate management. It is illustrated from the empirical models that managerial overconfidence has a significant impact on cash holdings, debt maturity and firm performance. In more detail, chapter 2 shows that managerial overconfidence negatively impacts cash holdings. That means overconfident managers tend to hold less cash in firm management, but the actual level of cash holdings is found to be not too far from the optimal level of cash holdings. Secondly, firms with overconfident managers are indicated as preferring to issue more long-term debt than short-term debt. However, the deviation between the actual level of debt maturity and the optimal level of debt maturity seems to be higher in firms with overconfident managers. Lastly, in the findings of chapter 4, it is found that managerial overconfidence has a positive impact on firm performance. With support from the positively significant impact from cash holdings and debt maturity on firm performance found in chapter 4, we can also conclude that managerial overconfidence seems to not bring risk or worse results for cash holdings, debt maturity and also firm performance. Those findings seem to be different compared to the prediction, suggestions

and findings from prior studies. But it can be a novel contribution to the research and also for corporate management in practice.

The use of different proxies for managerial overconfidence with different sample sizes and different research objects helps the results of the thesis becomes more strong, confident and valuable.

5.7. Contributions and recommendations

From the findings of all empirical chapters, we believe that the thesis contributes some strong contributions as follows.

Firstly, the thesis finds out the significant impact from managerial overconfidence on cash holdings, debt maturity and firm performance. In fact, from the literature review, there are just a few studies mentioning the impact of managerial overconfidence on these aspects, but they are just small studies or offer indirect judgments. The direct findings from the impact of managerial overconfidence on cash holdings, debt maturity and firm performance in this thesis are believed to be unique and novel.

Secondly, the thesis is based on the investigation of the relationship between managerial overconfidence and cash holdings, and between managerial overconfidence and debt maturity, subsequently expanding the research to examine the impact of managerial overconfidence on the deviation between the actual level of cash holdings and the optimal level of cash holdings, and the effect of managerial overconfidence on the deviation between the actual level of debt maturity and the optimal level of debt maturity. The findings of the significant relationships among those aspects are seen as a very valuable contribution to research.

Thirdly, through the findings in chapter 2 and chapter 3, combined with the results in chapter 4, the thesis also indicates an indirect relationship between managerial overconfidence and firm performance through analysing the impact of managerial overconfidence on cash holdings and on debt maturity and then the impact from cash holdings and debt maturity on firm performance.

Next, the most important key in this thesis is the use of voice pitch to measure managerial overconfidence. In fact, there are many different ways to measure managerial overconfidence in prior studies. However, the use of voice pitch is the first instance of using this measure for managerial overconfidence. More importantly, to avoid any bias in the regression results by using voice pitch, the thesis, with three main empirical studies,

uses several different measurements of managerial overconfidence that are suggested from previous studies to run the same regression models; And finally, a comprehensive index is constructed by combining all used overconfidence measures. The regression results for all models with different proxies of managerial overconfidence produced similar results. That means that the use of voice pitch is novel, strong and confident to measure managerial overconfidence.

The fifth contribution is the use of different research objects from different proxies of managerial overconfidence, including top-line managers from interviews, CEOs for the proxies for gender and the visibility of photographs in annual reports and the whole board of managers for the proxy for the bias in earnings forecast. The purpose of using different research objects is aimed at minimizing the bias in empirical regression results from only focusing on one managerial object.

The sixth contribution is the use of both the sub-sample size and extended sample size in examining the same issues. Not only mainly concentrating on one sample size, the thesis also attempts to extend the sample size to retest the research hypotheses to ensure that the findings are strongly confident.

Lastly, the final contribution comes from the research market. Vietnam is a developing country, with many different issues compared to other countries, especially developed countries, such as differences in the nascent history of the securities market, corporate governance and financial system. Further, there have been not many studies conducted in Vietnam thus far, therefore, the research conducted in Vietnam can be a very significant contribution.

The research includes some limitations such as there are only 123 firms in total sample size of the research. Secondly, voice pitch might be changed depends on different time or the emotional condition of interviewees. Additionally, in the existing literature, there are not many research papers conducted in Vietnam's context, especially in corporate finance field relating to cash holdings, debt maturity and firm performance. Hence, it is very difficult to make a comparison with the findings of this research with other findings in Vietnam.

Even though there are some limitations as mentioned, however, the use of extended sample size with similar regression results help to mitigate the disadvantage from small sample size. In terms of voice pitch, similarly, the use of many different methods to measure overconfidence besides voice pitch is also a very good way to minimize the bias of the

regression results. The same regression results among different models demonstrate that the findings of the research are consistent, strong and confident.

Further research can extend our research to investigate the impact of managerial overconfidence on other aspects of corporate management. The same measure for managerial overconfidence should be used in other studies with different research objects to confirm that voice pitch is a confident measurement for managerial overconfidence.

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INTERVIEW DESIGN

Each interview lasts for 15-30 minute.

There are three parts with 18 questions including 10 closed-ended questions and 8 open-ended questions.

- **Part 1: General questions**
- **Part 2: Optimistic and Overconfident measurement questions (Psychometric test)**
- **Part 3: Open-ended questions**

PART 1: General questions

Question 1: Gender	Female: ☐	Male: ☐

Question 2: Age	

Question 3: Education background	• **MBA***:*
	  Yes: ☐ No: ☐
	• **CFA:**
	  Yes: ☐ No: ☐

Question 4: Past experience (Before being CEO)	• **In Finance:** Yes: ☐ No: ☐ • **Other:** (In detail) ………

Question 5: Tenure (Number of years holding the current position)	

Question 6: Duality (Keep both CEO and Chairperson position)	Yes: ☐	No: ☐

PART 2: Optimistic and Overconfident measurement questions (Psychometric test)

Question 1.a: Risk-aversion

Assuming that the total value of **all** your assets is 1 million dollars, you are offered two investment projects that require 1 million dollars for the initial investment. Which project would you prefer?

- Project 1: 100% creating NPV equalling 1.3 million dollars in 3 years
- Project 2: 70% creating NPV of 10 million dollars in 3 years, but with 30% getting total loss.

Answer:

If the respondent picked project 2, the survey continued to ask question 1.b. If not, it went to question 2.

Question 1.b:

Assuming that total value of all your assets is 1 million dollars. You are offered two investment projects that require 1 million dollars for the initial investment. Which project would you prefer?

- Project 1: 100% creating NPV equalling 1.3 million dollars in 3 years
- Project 2: 50% creating NPV of 20 million dollar in 3 years, but with 50% getting a total loss.

Answer:

(Note: NPV: Net present value – The projected profitability of an investment)

Question 2: Optimism (Personal)

1. In uncertain times, I usually expect the best. 2. If something can go wrong for me, it will. 3. I'm always optimistic about my future.	<table><tr><th>Question</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th></tr><tr><td>I agree a lot</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>I agree a little</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>I neither agree nor disagree</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>

4. I hardly ever expect things to go my way.	I disagree a little						
	I disagree a lot						
5. I rarely count on good things happening to me.							
6. Overall, I expect more goods things to happen to me than bad.							

Question 3: Managerial Myopia (Think about the time value of money)

Question 3a: If you had an inheritance of $100,000, would you prefer to have it now with $100,000 or receive it as $140,000 one year from now?

1. Get it now with $100,000
2. Have $140,000 after one year

    (If you choose (1), please move to question 3b, if not, move on to question 4)

Answer:

Question 3b: What will you do with the $100,000 you receive today?

1. Keep it in a vault cash or deposit it in a bank account as savings.
2. Invest in security market/ other investments and what is your expected return?

Answer:

Question 4: Aversion to sure losses:

As a financial analyst, if your best friend came to ask you for advice, what would you advise him about his situation?

Last year, his company invested $5 million in a project that was expected to generate cash flows of $10 million after one year. A year has passed and the project has yielded nothing. Now your friend has the opportunity to invest an additional sum in this same project. There is a 20% chance that the project will generate a $10 million cash flow in a year's time and nothing thereafter. There is an 80% chance that the new investment will generate nothing at all. How should your friend do now?

3. Continue to invest extra $2 million US dollars to get the chance.	

4.	Stop the project	

PART 3:

Question 1:

    a) What are your benchmark decisions relating to cash holdings and debt maturity?

Answer:

    b) Do you believe cash holdings will impact firm performance? If yes, explain why.

Answer:

    c) Do you believe debt maturity has an effect on firm performance? If yes, explain why.

Answer:

Question 2:

Do you evaluate your company/ compare your company to your competitors? Who are your company's competitors?

Answer:

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Question 3:

What is your opinion about **Acquisition**? What do you think about any acquisition in the future of your company?

How many acquisitions have there been in your company since you were CEO?

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│ Answer:                                             │
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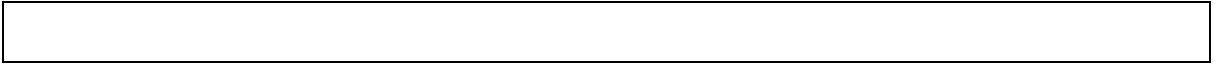
Question 4:

What do you think about the future economy of Vietnam, for example in the next 10 years?

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│ Answer:                                             │
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Question 5:

What do you think of the investment opportunities in your company's industry?

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│ Answer:                                             │
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THANK YOU SO MUCH FOR YOUR PARTICIPATION!