

MKM227 Postgraduate Dissertation

Student Number: u1251072

	Comments	Max Mark	Actual Mark
Introduction <i>Identification of a valid topic, research question and objectives framed to Masters Level standard with academic rationale developed, clear industry contextualisation of the research topic</i>	Supervisor Comments:	10%	
	2 nd marker Comments:		
Critical Literature Review <i>Depth and breadth of literature search, engagement with seminal authors and papers, evidence of a critical approach toward the scholarly literature</i>	Supervisor Comments:	25%	
	2 nd marker Comments:		

<p>Research Methodology</p> <p><i>Evaluation of research philosophies and perspectives. Justification of methodological approach, sampling strategy, data analysis and reliability and validity measures as applicable</i></p>	<p>Supervisor Comments:</p>	<p>15%</p>	
	<p>2nd marker Comments:</p>		
<p>Data Analysis and Interpretation</p> <p><i>Evidence of rigor in data analysis and interpretation procedures, identification of key patterns and themes in the research data, integration of academic theory into explanation of findings</i></p>	<p>Supervisor Comments:</p>	<p>35%</p>	
	<p>2nd marker Comments:</p>		

<p>Conclusions and Recommendations</p> <p><i>Research question and objectives addressed with implications to theoretical and managerial concepts considered. Recommendations provided for theory, practice and future research</i></p>	<p>Supervisor Comments:</p>	<p>10%</p>	
	<p>2nd marker Comments:</p>		
<p>Organisation, presentation and references.</p> <p><i>Well structured and ordered dissertation with correct use of grammar and syntax. In-text citation and bibliography conforming to "Cite Them Right"</i></p>	<p>Supervisor Comments:</p>	<p>5%</p>	
	<p>2nd marker Comments:</p>		

Total	First Marker Total	100%	
	Second Marker Total		
Supervisor General Comments:		Agreed Mark:	
2nd Marker General Comments:			

Supervisor's Name:

Signature:

2nd Marker's Name: **Signature:**

CORPORATE CASH HOLDINGS: DETERMINANTS AND IMPLICATIONS FROM VIETNAMESE MARKET

A dissertation submitted in partial fulfilment of the requirements of the Royal Docks Business School, University of East London for the degree of **Master of Science in International Accounting and Finance**

May 2014

[Word count: 13,743]

I declare that no material contained in the thesis has been used in any other submission for an academic award

Student Number: U1251072

Date: 13/05/2014

Dissertation Deposit Agreement

Libraries and Learning Services at UEL is compiling a collection of dissertations identified by academic staff as being of high quality. These dissertations will be included on ROAR the UEL Institutional Repository as examples for other students following the same courses in the future, and as a showcase of the best student work produced at UEL.

This Agreement details the permission we seek from you as the author to make your dissertation available. It allows UEL to add it to ROAR and make it available to others. You can choose whether you only want the dissertation seen by other students and staff at UEL ("Closed Access") or by everyone worldwide ("Open Access").

I DECLARE AS FOLLOWS:

- That I am the author and owner of the copyright in the Work and grant the University of East London a licence to make available the Work in digitised format through the Institutional Repository for the purposes of non-commercial research, private study, criticism, review and news reporting, illustration for teaching, and/or other educational purposes in electronic or print form
- That if my dissertation does include any substantial subsidiary material owned by third-party copyright holders, I have sought and obtained permission to include it in any version of my Work available in digital format via a stand-alone device or a communications network and that this permission encompasses the rights that I have granted to the University of East London.
- That I grant a non-exclusive licence to the University of East London and the user of the Work through this agreement. I retain all rights in the Work including my moral right to be identified as the author.
- That I agree for a relevant academic to nominate my Work for adding to ROAR if it meets their criteria for inclusion, but understand that only a few dissertations are selected.
- That if the repository administrators encounter problems with any digital file I supply, the administrators may change the format of the file. I also agree that the Institutional Repository administrators may, without changing content, migrate the Work to any medium or format for the purpose of future preservation and accessibility.
- That I have exercised reasonable care to ensure that the Work is original, and does not to the best of my knowledge break any UK law, infringe any third party's copyright or other Intellectual Property Right, or contain any confidential material.
- That I understand that the University of East London does not have any obligation to take legal action on behalf of myself, or other rights holders, in the event of infringement of intellectual property rights, breach of contract or of any other right, in the Work.

I FURTHER DECLARE:

- That I can choose to declare my Work "Open Access", available to anyone worldwide using ROAR without barriers and that files will also be available to automated agents,

and may be searched and copied by text mining and plagiarism detection software.

- That if I do not choose the Open Access option, the Work will only be available for use by accredited UEL staff and students for a limited period of time.

/cont

Dissertation Details

Field Name	Details to complete
Title of thesis <i>Full title, including any subtitle</i>	Corporate cash holdings: Determinants and implications from Vietnamese market
Author <i>Separate the surname (family name) from the forenames, given names or initials with a comma, e.g. Smith, Andrew J.</i>	Kim Hoang CAP
Supervisor(s)/advisor <i>Format as for author.</i>	Dr. Cuong Nguyen
Author Affiliation <i>Name of school where you were based</i>	
Qualification name <i>E.g. MA, MSc, MRes, PGDip</i>	MSc
Course Title <i>The title of the course e.g.</i>	International Accounting and Finance
Date of Dissertation <i>Date submitted in format: YYYY-MM</i>	2014-05
<i>Do you want to make the dissertation Open Access (on the public web) or Closed Access (for UEL users only)?</i>	Open Access

By returning this form electronically from a recognised UEL email address or UEL network system, I grant UEL the deposit agreement detailed above. I understand inclusion on and removal from ROAR is at UEL's discretion.

Name: Kim Hoang Cap

Signature: Kim Hoang CAP

Date: 13/05/2014

ABSTRACT

This paper investigates the determination of corporate cash holdings in Vietnam. The sample includes Vietnamese publicly-traded firms for the period 2010-2013. Determinants include financial indicators as firm-specific characteristics and state ownership as an institutional factor for the purpose of exploring the existence of agency costs for this emerging market. Findings of the study suggest that the theoretical frameworks, namely trade-off model, pecking order theory and free cash flow theory, are at work for the Vietnamese sample. Significant determinants are profitability, firm size, leverage, dividend payout and investment in asset tangibility. However, the findings do not confirm the largely found relationship between market-to-book ratio and corporate cash holdings for Vietnamese firms, which is normally expected to be positive in sign. At industry level, findings for determinants on cash holdings by different industry sectors show a significant variance, especially for the sectors that are mainly composed of state-owned enterprises (SOEs). In general, sectors with mostly private firms mirror the results of the entire sample better. Although agency problems due to state ownership are detected at industry level, they are not severe in general.

ACKNOWLEDGEMENT

Special thanks to Dr. Cuong Nguyen for offering me a helpful supervision on this research paper, providing me with critical guidance and taking the time to support me through the research stages.

My gratitude and appreciation to all the professors that have delivered interesting lectures for this master course, making my journey through the last academic year an exciting and unforgettable experience.

My recognition of precious support from Royal Dock Business School, from granting me the scholarship as academic support at the very first stage of approaching the school to giving me all the facilities I need to carry out this research on these final days of the master degree.

A big thank you to my friend for supporting me, both mentally and physically, through this hard work.

And lastly, a thousand thanks to my beloved family.

I dedicate this work to my nephews.

CORPORATE CASH HOLDINGS:

DETERMINANTS AND IMPLICATIONS FROM VIETNAMESE MARKET

I. INTRODUCTION

Let us all agree that cash is important. But not until the financial world witnessed the Lehman Brothers collapse in 2008, triggering the financial crisis and shattering worldwide confidence, did cash become a more critical thing than ever as governments made every effort to provide liquidity to rescue as many of their banks and financial institutions as possible from ending up with the same fate as the US giant bank. Just after a few days since Lehman Brothers filed its bankruptcy in the US, on the other side of the Atlantic Ocean were so many major banks and financial institutions also preparing to get bankrupt and collapse that The European Central Bank had to inject an extra €30bn (£24bn) to boost liquidity and the Bank of England £5bn while back in the US the Federal Reserve had just doubled the size of the rescue package to \$200bn and the ten biggest investment banks raised a \$70bn liquidity pool for any one of them to tap. The non-financial sector all over the world was also seriously hurt. Construction companies all across Europe and real estate firms found they had no cash, because the housing market was as if it had never existed. Many industrial firms, especially the automobile and heavy manufacturing firms, also suffered so deeply that in order to regain essential liquidity level, they changed their manufacturing as well as sourcing strategies dramatically, cut production volume, and made employees redundant to save every dollar of cash. The ‘cash death’ did not exempt even growing and excellent performing firms because they simply could not survive if they ran out of cash or did not get enough cash inflows.

1. Background of the study

As one saying goes, ‘revenue is vanity, cash flow is sanity, but cash is king’, whilst it may appear better to have good inflows of revenue from sales, cash on hand is still the most important focus for a business to stay on. Businesses may be able to continue to operate in the short-to-medium term even if they are making a loss as long as they can delay paying creditors or have enough money to cover variable expenses. Despite of that, it cannot survive long if its immediate needs are not fulfilled with cash.

More than five years after the financial crisis, there have been records of cash held by households as well as corporations. Cash and its important role are now the business focus as a large number of the world’s biggest non-financial companies are now building up some trillion dollar gross cash pile, according to a study by advisory firm Deloitte. Obviously companies are now clinging to cash in a precautionary manner because spending on capital expenditure is still slowly increasing, especially where the effects of the crisis can still be seen. In another recent analysis by Standard & Poor’s, non-financial companies worldwide were said to be underinvesting; and if a more ‘normalised’ recovery path had been followed in 2012 and 2013, an extra \$900bn of cash would have been spent by these companies over those two years. In light of this recent study on cash holdings, it is relevant to raise the discussion about whether companies are holding too much cash and how it can be justified. More interestingly, what are the implications and adjustments as a result of this cash excess?

Management that aims to maximize shareholder value would technically set the firm’s cash holdings at a level such that the marginal benefit and the marginal cost of those holdings are equal. The former can be referred to as the transaction costs saved as firms do not have to raise external funds and do not need to liquidate assets to make payments; and because external funds are sometimes extremely costly to acquire, firms with good liquidity holdings can use this internal fund to finance its major operating activities and investments. The first benefit is described by Keynes (1934) as the transaction cost motive for holding cash, while the second one as the precautionary motive. The possible costs of holding cash include the low rate of return of the liquidity assets and tax disadvantages. Other costs have evolved from brokerage costs, according to Miller and Orr (1966), to costs that are incurred by inefficient investment activities due to insufficient liquidity, as shown in theoretical models

such as Myers (1977) and Myers and Majluf (1984). Some empirical works have also emphasized this kind of cost.

So theoretically, from the perspective of maximizing shareholder wealth, this trade-off view can contribute to answering whether a company is holding too much cash from an ‘optimal’ level. However, alternative to this trade-off theory is the view about the irrelevance of cash holdings which can be implied from the irrelevance of capital structure theory because cash is negative debt. This alternative view is also supported by the pecking order theory, first theoretically developed by Myers and Majluf in 1984. And yet cash holdings under this pecking-order, also known as the financing hierarchy model, is hardly consistent with the shareholder value maximisation providing that there is a cost to holding cash and shareholders would be better off if excess cash is used for dividend payouts or share repurchases.

As the discuss goes on in the above direction, there have been a lot of both theoretical and empirical studies on cash holdings so far, including famous works on the popular topic of what determines cash holdings and its implications (Opler, 1998) as well as further works on different types of relationships between cash holdings and corporate governance (Dittmar, 2003), ownership concentration (Ameer, 2012), firm structure (Subramaniam, 2010) etc. The literature related also goes largely as it does deeply since there have been also numerous researches on cash holdings topics for different parts of the world’s economy.

2. Research objectives

The purpose of this paper is to examine the determinants of corporate cash holdings in Vietnam. As Thieu (2013) researched on manufacturing firms in Vietnam but only to investigate the firm-specific determinants, this paper is intended to complement his work both horizontally and vertically:

- (1) by covering firms across more industrial sectors
- (2) by analyzing more deeply the impact of agency costs on cash holdings level since this issue has been proved to play a significant role in a major part of previous literature on developed countries.

As emerging market contains a number of imperfections and problems, especially problems concerning information asymmetries and ownership structures (a considerable number of firms are state-owned), it is believed that these objectives are important and relevant for the research under this topic.

3. Research questions

- (1) What are the determinants of cash held by enterprises in Vietnam, and
- (2) How do they differ in terms of implications, in particular for agency costs in state-owned corporations, from findings of previous studies of cash holding determination in developed market?

4. Motivation for the study and its significance

In Vietnam, as well as in other emerging Asian countries, there has been a credit crunch as a form of resonance effect from the financial collapse in the western part of the world as Vietnamese economy has long been in a strong relationship with the US in exporting and importing. Historically Vietnamese firms depend heavily on short-term bank loans and the recent high interest rates situation in Vietnam has somewhat affected cash holding behaviours, which is believed to be an exciting topic to explore. More importantly, investigation into emerging market can significantly contribute to the knowledge of the field as there will be a relatively different settings, regarding macro-economic since Vietnamese economy is still in its transitional stage to become a market-oriented one and both equity and capital markets are still in the incomplete state. On micro-economic level, there are differences between the way firms are operated and governed in Vietnam compared to countries in developed market. One of the major differences is that corporate governance is still a fresh concept and is attracting a lot of attention as to how to have it well introduced and then applied and how to harmonize it with state regulations.

However there are not many researches or studies on this aspect of corporate finance for the Vietnamese market, hence this research is carried out with an aim to contribute to a larger coverage of the literature in the field.

5. Research method and findings

Research is carried out on 172 publicly-traded firms on Ho Chi Minh Stock Exchange (HOSE) and Hanoi Stock Exchange (HSE) for the period from 2010 to 2013. Data on cash holdings and firm-specific factors in local currency is collected from Bloomberg database.

Results from multiple regression using OLS methods reveal their consistency with most of the findings for developed markets, with less significant though, in terms of the impact of firm-specific determinants. However, when state-ownership is considered as an important input there are differences regarding the impact of those determinants even though the magnitude of those differences are only insignificant.

The remainder of this paper is structured as follows: Section II reviews the previous literature of the topic in question, including theoretical and empirical studies; Section III explains the development of hypothesis, the collection and process of data and the methodology; Section IV discusses the findings and their implication; and Section V concludes the paper.

II. LITERATURE REVIEW

Empirical studies about the determinants of cash holdings by corporate have recently occupied a central place in the vast corporate finance literature. According to Gill and Shah (2012) cash holdings include ‘cash in hand or readily available for investment in physical assets and to distribute to investors’. It is therefore viewed as cash and cash equivalents which can be easily converted into cash. Modigliani-Miller payout policy irrelevance says that if the capital markets are perfect, a firm’s choice of payout or retention of its excess cash is irrelevant and does not affect the value of the firm. However, corporate taxes make it costly for the firm to hold excess cash. Despite of that, some firms still accumulate their cash balances, which help firms minimize the transaction costs of raising external fund when potential cash needs are to be met. Apart from that, there would be no added value to shareholders of firms retaining too much cash than needed.

1. Why do firms hold cash?

As the starting point of view, Keynes theory (1936) states cash is held because of transaction cost and precautionary motives.

1.1 Transaction cost motive

Based on this, a transaction cost model is evaluated by Opler et al (1999), who then conclude that the model implies that if it is costly for a firm to raise funds, the amount of cash held will increase if there is an increase in cash flow volatility and the length of the cash conversion cycle. However, with the inclusion of tax, cash holdings will decrease as the cost of holding it increases with the marginal tax rate. An alternative view to the tax disadvantage is that multinational firms tend to accumulate tax to take advantage of tax consequences (see Foley, Hartzell, Titman, and Twite 2007). Other factors that can impact cash holdings magnitude include interest rates and the slope of the term structure, cost of raising debts, the easiness of selling assets, cost of hedging risk and the size of a firm’s dividend (Opler, 1999).

Support for the transaction cost motive can also be found in the results of the same paper of Opler et al (1999). There found supportive evidence that firms with strong growth opportunities which have potential NPV investment projects, firms with riskier activities and

firms of smaller sizes, because of asymmetric information, tend to hold more cash than other firms. Meanwhile firms that have greater access to the capital market, most of which are large corporations and those with favorable credit ratings, hold less cash. These results are consistent with the view that firms hold liquidity to enable ongoing investment, and to reduce costs of raising funds when these costs are excessively expensive. Sample for this well-established research includes publicly traded U.S firms in the 1971-1994 period.

1.2 Precautionary motive

As for the precautionary motive, managers often choose to retain excess cash in order to reduce a firm's leverage ratio as well as to solidify their job security. Under this motive for corporate cash holdings, cash is held as a buffer to protect firms against adverse cash flow shocks. Also found in the same paper of Opler et al (1999) is evidence consistent with this explanatory view for holding cash since results show management accumulates excessive amount of cash when it is possible to do so. This is often referred to as the agency motive. According to free cash flow theory of Jensen (1986), entrenched managers would prefer to retain cash than increase payouts to shareholders – even when the firms have poor investment opportunities. Cross-country evidence is also found by Dittmar, Mahrt-Smith and Servaes (2003) that corporate cash holdings are higher in countries with greater agency problems. Cash is also found worth less when agency problems are greater between insiders and outside shareholders (Dittmar and Mahrt-Smith, 2007 and Williamson, 2006).

In summary, the initial motives for corporate cash holdings are transaction, precautionary, agency and possibly, tax motives. Among these, more and more studies and researches work on the impact of agency problem on cash holdings in terms of retention and spending of excess cash, as shown in work of Mahrt-Smith (2007) and Harford, Mansi, and Maxwell (2008) where there is evidence suggesting entrenched managers who build excess cash balances are more likely to spend that cash quite quickly. Other impacts of agency problem have also been worked on to investigate the relationship between cash holdings and ownership concentration (Ameer, 2012); cash holdings and protection level of investors rights (Lee Pinkowitz, René Stulz and Rohan Williamson, 2003) with evidence implying the importance of agency costs in the way minority investors value cash holdings by corporations. Another interesting finding about agency problem from the same perspective is from the

paper of Elion Jani, Martin Hoesli and Andre Bender (2004) with results showing that cash holding behaviour is substantially affected by the institutional context as firms with less concentrated ownership keep more cash; and firms with different voting right share experience slower cash holdings adjustments than firms with simple and unique voting right structure.

2. Cash holdings and their determinants

Not until Tim Opler et al. established their paper on cash holdings in the US did cash holdings determinants start to attract more and more attention from academics and analysts, who later make use of the developed model in the paper to go deeper and larger to approach the topic from many other perspectives. For the last ten years the literature of the field has largely and deeply expanded since researches on cash holdings have shown interests, in addition to determination of cash holdings, in the relationships between cash holdings and other aspects of a corporate such as ownership concentration, firm structure, shareholders protection and markets of different level of information symmetries, etc. There are recent works that look at the issue at industry or national level, or by comparing between industrial sectors or nation groups. Most of these works have their models developed from the original model of Opler (1999) by adding new variables and/or conditions while some directly use it to investigate the effects from the model application in other markets that have not been studied on before. However, before we start the discussion of these recent empirical studies it is necessary we first address the studies that established the theoretical foundation for later works in the modern literature.

2.1 Theoretical framework

In a world with the existence of transaction costs, agency costs and information asymmetries, the cash holding determination debate will be approached within the two important theoretical frameworks: the tradeoff theory and the pecking order theory.

- a. *The tradeoff theory.* Under this theory, firms can set an optimal level of liquidity holdings by weighing the marginal costs and marginal benefits of holding liquidity. Some of the benefits include (1) reducing the likelihood of financial distress, (2) ensuring the continuance of investment policy implementation, and (3) avoiding as much as possible

the costs of raising funds of selling assets to increase liquidation (Ferreira and Vilela, 2004). The cost of holding liquidity is often associated with the opportunity cost of holding them because of the lower rate of return on those liquid assets.

This cost is also referred to as the liquidity premium by Opler (1999) whose discussion of liquid assets' opportunity cost suggests that this cost would be highest for cash, and to decrease for assets that go down in their level of cash substitution. For instance, liquid assets held as demand deposits will have their opportunity cost increase with interest rates. Another cost of holding liquid assets is taxes, especially where interest income from those assets is taxed twice. Also according to Opler (1999), the cost of holding liquidity will increase with the corporate marginal tax rate.

- b. *The pecking-order theory.* The pecking-order theory view of cash holdings stems from that theory of capital structure proposed by Myers and Majluf (1984). Information asymmetries make it more difficult to seek outside financing. Investors want to ensure that their securities purchase is not overpriced so discount them appropriately. However, since outsiders know less than insiders (management), their discounting approach may underprice those securities, which means that the more information sensitive a security is, the higher the cost of raising outside fund. As a result of these information asymmetries and signaling problems associated with external funding, a financing hierarchy is considered with preference of internal over external resources.

Where information asymmetries become more and more important, firms may be forced to reduce investment in case of cash shortage, and hence involving greater costs. This cost of financial distress is expected to be greater for firms with high R&D expenses as those expenses are seen as a type of investment where information symmetry is almost impossible. Consequently, firms with higher R&D expenses are more likely to have higher holdings of liquidity assets (Opler and Titman, 1994).

- c. *Other theoretical discussions: Agency costs of debt and of managerial discretion*

Agency costs of debt arise when there is an interest conflict between those of shareholders and those of debtholders. This type of conflict may also appear among various classes of debtholders. This problem means more difficulties and more costs for more highly

leveraged firms seeking external resources. As argued by Jensen and Meckling (1976), debt will be more expensive for those firms both in terms of return rate and attached covenants. So in order to avoid these costs of debt, firms with potential valuable investment projects are expected to hold more liquidity – even though maintaining a low level of leverage can also be helpful to avoid those high costs of debts.

Under the agency costs of managerial discretions, cash is held so that management can pursue its own objectives at shareholders' expense. Specifically, the entrenched management may be simply risk averse and holding excess cash can help it avoid market discipline. Therefore anti-takeover firms are more likely to be found to hold excess liquidity (see Opler et al., 1999). Another possibility is that excess cash facilitates management to pursue investment projects. In this case cash is not negative debt because the capital markets may not be willing to finance those projects, which means management may not be able to raise debt whenever it needs to while it can use the cash whenever it wants to. The third cause for these agency costs is that management prefers keeping funds inside the firm than distributing to its shareholders, as suggested by the free cash flow theory of Jensen (1986). As a result of this, under this theory, management is likely to spend the cash on poor projects when there are no good ones available because it needs to find ways to make use of the cash available (also see Ferreira & Vilela, 2004). But if a firm has numerous valuable opportunities to invest these costs will become trivial since in this case the objectives of management and shareholders are likely to coincide. Theoretically, in order to help align interests of management and those of shareholders management is expected to hold part of the shares. But still, according to Opler (1999), management may get more risk averse because of that managerial ownership, hence expected to hold more cash when the ownership increases.

In summary, the theoretical background usually has the tradeoff and the pecking order and the free cash flow theories to explain the pattern of liquidity holdings. There could be an optimal level of cash holdings by equaling their marginal costs and marginal benefits according to the tradeoff theory; meanwhile the pecking order theory of Myers (1984) does not suggest a cash holding target because there is a preference of internal funds to be used before external resources are considered. However the phenomenon of asymmetric

information, which helps explain the pecking order model, does make cash held as a buffer between retained earnings and potential investment needs. Lastly, the free cash flow theory of Jensen, which contributes to explaining the agency costs of managerial discretion, describes managers' incentives to pile up cash to get more assets under their control as well as to acquire more power in hand over the firm's investment decisions.

The next discussion includes review of empirical evidence for cash holding and its determination found in previous literature.

2.2 Empirical studies on cash holdings determinants

As described by Cossin and Hricko (2004), one of the important roles of liquidity holdings for a firm's operations is that they help ensure optimal timing of investments and avoid the under pricing issue. However, excess of cash held within firms with fewer investment opportunities can reduce firm value (Easterbrook, 1984; Dittmar et al, 2003). This explains why cash holding's determination attracts much attention from company managers, financial analysts and researchers. Empirical studies on this topic mostly employ the model developed by Tim Opler et al (1999) to investigate how influential the factors related to firm characteristics can be on cash holdings level. These factors and their proxies include financial distress (leverage and R&D expenses ratios), investment opportunities (market-to-book ratio), cash flow riskiness (standard deviation of industry cash flow) and liquid assets substitution (net working capital less cash). Problem of agency costs of managerial discretion is also largely considered in these empirical studies, inserted as a dummy variable in the model with proxies being ownership percentages between management and the firm's shareholders.

The next discussions will be dedicated to discuss researches on different types of market. Since this paper's purpose is to provide more evidence to the field's literature with more insight into markets other than those that have already been studied, this literature review will start discussing the studies on developed countries. Researches which focus on the emerging market will be reviewed later.

2.2.1. Determinants of cash holdings: Evidence from developed markets

Several pioneering studies on cash holdings include works on the US manufacturing sector, by Nadiri (1969) and then Campbell and Brendsel (1977), with data from 1948-1964 and from 1953- 1963, respectively. The former investigated the desired level of real cash balances, with results showing determinants of demand for real cash balances being outputs, interest rates, expected rates of change in general price levels and factor prices. The latter used OLS regression analysis methods to examine how compensating balance requirements can impact cash holdings and found that those requirements are not binding.

The most influential work in the field by Opler et al. (1999) also examines the US market, but more complete and firm characteristics-oriented. Data was collected for the period from 1971 to 1994 from 1048 listed firms in the US for the purpose of finding determinants of corporate cash holdings and their implications. By carrying out time-series and cross-section tests, they came to the findings that firms with strong growth prospects and more volatile cash flows hold relatively more cash and cash equivalents – scaled by total assets less cash. Firms with greater access to the capital market are more likely to hold lower ratios of cash. Firms that do well were also found to have a tendency to accumulate more liquidity (cash) according to this well-known paper.

In the same year 1999, Harford approached a sample of acquisition attempts by US firms between 1977 and 1993 and found evidence supporting the free cash flow theory's agency costs, which provides an explanation for why cash-rich firms in the sample were found to be more likely to attempt acquisitions than the others.

At a more international level, Dittmar et al (2003) worked on a sample of over 11,000 firms from 45 countries and found that firms in countries with low protection of shareholder rights retain cash up to twice as much as firms in countries with better shareholder rights protection do. The findings from the research also imply a less important role of such factors as investment opportunities and information asymmetry, which would normally drive the demand for holding cash, where shareholders rights protection is quite low.

Ferreira and Vilela (2004) collected a sample of 400 firms in 12 Economic and Monetary Union nations from 1987 to 2000 to evaluate how corporate cash holdings are determined. Results show a positive relationship between investment opportunity sets, cash flows and cash holdings; while assets' liquidity, leverage ratio and firm size are negatively related to cash holdings. Bank debt is also negatively related to cash holdings, which implies that a close relationship with banks allows firms to be less precautionary in holding cash. Firms with greater investor protection and highly concentrated ownership tend to hold less cash, supporting the theory of agency costs of managerial discretion in explaining levels of cash holdings. These results are supported by findings in Dittmar et al. (2003) but do not confirm the evidence in Dittmar's work (2003) that capital markets development level can positively impact cash holdings. EMU firms in more developed capital markets are found to hold less cash, which means a contrast to the agency cost view.

A paper on the institutional context as a driving force of liquidity holdings by Elion Jani, Martin Hoesli and Andre Bender (2004) for the Swiss market from 1990 to 2000 has a focus on the impact of ownership concentration, voting rights, growth prospects, and information asymmetries. Swiss firms are characterized by high cash holdings and concentrated ownership while minority investors are poorly protected. The work gives evidence supporting both trade off and pecking order theories. Firms with different voting right shares tend to adjust less quickly than firms having one simple and unique structure of voting right.

With more focus on why firms hold cash at industry level, Kim et al. (2011) studied 125 publicly-trade US restaurant firms from 1997 to 2008 and stated that restaurant firms with greater investment opportunities are likely to hold a higher level of cash balance. Meanwhile, there are results suggesting that large restaurant firms, firms with high amount of cash substitution assets and firms incurring high capital expenditures, and firms paying more dividends hold less. In this paper both precautionary and transaction motives are described to play an important role in explaining cash holdings for these firms.

This paper's last literature review of cash holdings' studies in developed markets will address a recent study on cash holdings' determinants to find evidence from Canada (Charul Shah, 2012). A study on 166 Canadian firms listed on Toronto Stock Exchange

between 2008 and 2010 showed support for the role of agency problems in determining corporate cash holdings.

In short, most of the studies in the field have been dedicated to countries or groups of countries in the developed markets and most of them found support for the framework theories of tradeoff and pecking order. Firm characteristics such as firm size, growth prospects, leverage, and net working capital have been substantially examined, with results about their impact on cash holdings relatively consistent with each other. However, another important determinant that has been drawing more and more attraction from researchers, corporate governance (represented by ownership structure, shareholding dispersion, and level of shareholders' right protection) remains different or even contradicts in its impact on cash holding issue among studies focusing on agency costs as an important factor. Nevertheless, in general, most of the findings imply an important role of agency costs in corporate cash holdings; and firms with better institutional quality, e.g. good shareholder protection, are more likely to hold less cash than firms with poorer corporate governance.

2.2.2. Cash holding in emerging markets

Discussion of firms in countries in emerging markets will have different setting, especially from the institutional perspective. Many listed firms in emerging markets are state-owned, as in China (Al-Najjar, 2013) as well as in Vietnam (Nguyen and Ramachadran, 2006). Corporate governance is still a new concept in many of these countries as a majority of them have just passed or are still in the middle of the transitional stage of economy to become market-oriented. That is why it is necessary there be an investigation into these countries, especially when finance and its corporate applications are new topics themselves, compared to other aspects of business.

And yet cash holding and its determination is given attention even later, since in the previous literature not many studies was dedicated to cash holdings in emergent markets until fewer than 10 years before the writing of this paper. There have been studies on this topic in emerging countries across Asia (China, Pakistan, Turkey, India, Vietnam, etc.), South American (mainly Brazil) and Africa (Nigeria, for example). This paper will focus more on literature for Vietnam and countries of similar characteristics, which are mostly in

south-east Asia. This is to eventually establish relevant empirical evidence in a consistent market characteristics setting.

A paper on cash holdings determination for the Chinese market by Megginson and Wei (2010) presents a study on the relationship between state-ownership and cash holdings from 1993 to 2007. The study suggests agency problems in state-controlled firms, which accounts for a lower value of their cash holdings. In addition, the study finds evidence for a positive association between cash holdings and firm size, profitability and growth opportunities. Cash holding is found in the research to be negatively affected by leverage and net working capital.

Another paper on a group of developing markets, but on an international level, is carried out by Al-Najjar (2013) to explore corporate cash holdings in Brazil, Russia, India and China in terms of cash holding determination under the impact of firm characteristic and corporate governance. The results suggest that emerging markets differ from developed market in financial and governance structures but share similar patterns in cash holding's determination and management behaviors.

For Vietnamese market, Thieu (2013) examined the determinants of cash holding for manufacturing firms between 2006 and 2011 with the application of the three framework theories tradeoff, pecking order and agency costs. To the best of my knowledge, this is the only paper working on cash holdings and their determinants in Vietnam so far. However, this paper simply focuses on the impact of firm characteristics and does not concern target cash holdings and it uses a simple regression for the static panel data model. There is support from the paper for negative impact of bank debt, leverage and asset liquidity on cash holding levels. Dividend payments, firm sizes and cash flows are positively related to cash holdings. In addition, managerial ownership is found to have little impact on the decisions of cash holdings. Therefore the research proposes a view that agency problem is less important in Vietnam than it is in developed countries like US and UK.

Despite of its limited presence in previous literature, more research on the emerging market can be found in the previous literature of the field, e.g. research by Ogundipe et al. (2012) for Nigeria, Anand (2012) for India. Most of them simply investigated cash

holdings' firm-specific determinants using Opler's model (1999) to seek evidence from those countries. Another one which looks further into agency problems in addition to the determinants' examination in Pakistan is the work by Afza and Adnan (2007). Findings of this study are consistent with previous work in developed countries regarding the impact of firm characteristics.

III. HYPOTHESES, DATA AND METHODOLOGY

1. Hypotheses

In this section hypotheses are developed with discussion of firm characteristics in relation to cash holding which includes leverage, growth opportunity, size, profitability, liquidity, investment in tangible assets, net working capital, free cash flow and dividend policy. These are widely observed and frequently researched determinants, as found in the discussed literature review. In addition, state-ownership is also included to reflect the country-specific impact on corporate cash holdings in Vietnam.

- a. *Leverage.* The fact that most Vietnamese firms rely on short-term borrowings, found in many researches on capital structure in Vietnam (Nguyen and Ramachadran, 2006), suggests that firms in Vietnam tend to use short-term debts as a substitute for holding cash (John, 1993). This negative relationship is proved in the works of Hardin (2009) for the US market. The same results are also found in researches on emerging market by Afza and Adnan (2007), Rizwan and Javed (2011), both of which are for Pakistani firms, and by Megginson and Wei (2010) for Chinese market.

H1. *Ceteris-paribus*, there is a negative relationship between leverage and cash holdings.

- b. *Growth opportunity.* As discussed above in the chapter of literature review, the pecking order theory leads to the implication that firms with strong growth opportunities avoid the costs of underinvestment and of financial distress so such firms are likely to maintain high balances of cash for reason of precaution. However, according to the free cash flow theory, firms with less growth opportunities are also likely to have high cash balances as entrenched managers keep cash to pursue their own interests.

So far there have been some empirical studies supporting the first view, as found by Opler et. al (1999) for the US, Kim et al (2011) for American restaurants and Ferreira and Vilela (2004) for Economic and Monetary Union nations. Nguyen (2013), working on manufacturing firms in Vietnam, found a positive relationship between MTB ratio and cash holdings. That was also found, but with less significance, by Ogundipe et al (2012) for Nigerian firms.

H2. *Ceteris-paribus*, cash holdings are positively affected by growth opportunities.

- c. *Size.* A major proportion of Vietnamese firms are SMEs and they are found to have low level of liquidity but high level of leverage (Nguyen and Ramachadran, 2006). Nguyen (2013) found that large firms in Vietnam hold their cash tightly to maintain the large scale of their focused business. Smaller, and growing, firms tend to have low cash balances as most of their operating profit is turned into re-investment and re-financing because asymmetric information makes it more difficult for small-sized firms to raise external funds for new projects. In this case, firm size is a proxy for information asymmetry (Ozkan and Ozkan, 2004).

H3. *Ceteris-paribus*, there is a positive relationship between firm size and cash holdings.

- d. *Profitability.* Firms with high profitability are likely to stockpile cash as retained earnings rather than pay it as dividends to stockholders. According to Opler et al. (2009), firms doing well tend to accumulate cash. The pecking order theory supports this view as profitable firms, as especially small ones in Vietnam in the discussion above, may prefer to retain cash for re-financing their operations in the context of high information asymmetry. Agency costs problem, which is one of the outstanding imperfections in emerging markets, can also mean entrenched managers retain cash as part of operating profit to pursue their own projects.

H4. *Ceteris-paribus*, there is a positive association between profitability and cash holdings.e

- e. *Liquidity.* Liquidity is measured as one of the predictors since liquid assets is an important substitution for cash. Liquid assets can be converted into cash with less cost than other assets. Therefore, firms with possession of high level of liquid assets are expected to be less reliable on cash. This is consistent with suggestions of trade-off theory. Based on this, Ferreira and Vilela (2004) argue that liquid assets can be easily turned into cash; hence they play as substitutes for cash.

H5. *Ceteris-paribus*, there is an inverse relationship between assets liquidity and cash holdings.

- f. *Investment in fixed assets.* Asset tangibility is also a researched determinant found in previous literature of the field. Negative relationship between corporate cash holdings and asset tangibility is found by Drobetz and Gruninger (2007).

H6. *Ceteris-paribus*, there is an inverse relationship between investment in fixed assets and cash holdings.

- g. *Free cash flow.* The fact that internally generated funds should be firms' first choice of financing, under the pecking order theory, suggests that firms have a tendency to increase their reserve of cash whenever it is possible for them to do so (Opler et al, 1999). Hence, all other factors remaining unchanged, the larger the amount of free cash flow, the larger the amount of cash reserves.

H7. *Ceteris-paribus*, cash flow and cash holdings are positively related.

- h. *Capital expenditure.* Under the pecking order theory, there is a negative relationship between capital expenditure and corporate cash holdings. A large amount of capital expenditures is expected to drain out cash balances. In addition, since these spending mean more assets that may serve as collateral for borrowings, debt capacity is greater in this case. This, in turn, will result in less demand for cash. This is supported by Bates et al. (2009), who finds a negative association between cash holdings and capital expenditures.

H8. *Ceteris-paribus*, capital expenditures and cash holdings are negatively related.

- i. *Dividend payout.* Another substitution of holding cash is paying dividends. Firms can decrease their dividend payments in the event of cash shortfall. Negative relationship between dividend payout and cash holdings is suggested by Opler et al. (1999). However, in order to maintain the level of dividend payments, firms that historically pay dividend are also expected to maintain higher cash balance than firms that do not pay out as dividend. As a result, a positive relationship probably exists between dividend payout and cash holdings. Therefore, no certain prediction is given here but dividend payout is included in the regression as a dummy variable.

- j. *State ownership.* The work on capital structure of Vietnamese firms by Nguyen and Ramachandran (2006) shows a large presentation of state-owned companies in the sample of Vietnamese SMEs and finds a strong link between those firms with high level of bank

debts due to networking and relationship between management and commercial banks. The high proportion of bank debts in state-owned firms in Vietnam suggests a low level of cash holdings by those firms, as suggested by this work, because a large proportion of those bank debts is short-term so there is an insignificant reliance on cash holdings for those firms. However, state-owned firms in emerging market are also where agency costs (entrenched management) can become significant as they are strongly protected and guaranteed by the governments. This positive relationship – state-owned firms hold more cash – is found for Chinese firms by Megginson and Wei (2010). State ownership is also measured in the regression as a dummy.

2. Data: Collecting and handling process

2.1 Sampling

Since Vietnamese market is still in the developing stage, which results in the significance of the market imperfections, sampling frame is an important procedure in the process of data collection. A perfect correspondence between the sampling frame and the target population is rarely found; but the former represents the target population (Nguyen, 2006). Ho Chi Minh City and the capital Hanoi represent the most important economic areas for the south and the north of the country, respectively. So to test the hypotheses developed above, only Vietnamese firms listed on the stock exchanges of Ho Chi Minh City (HOSE) and Hanoi (HSE) are included in the investigation.

2.2 Investigated period

Information is collected for the period from 2010 to 2013 due to a high level of data missing by 2010. The years within this period are when the stock market in Vietnam is better developed and information for the period is more meaningful because of improvement in market imperfections. It is also a favourable period to investigate in order to have an evaluation of how Vietnamese market is performing since the implementation of ‘Doi Moi’ by the government in 1986, a policy to transform Vietnamese market from a centrally-planned to a market-oriented economy.

2.3 Collection and handling process

Data is collected from Bloomberg database and handled in Excel for test preparation. Financial firms are excluded because of their inventories of marketable securities under cash item account. These financial firms are also required to meet statutory capital requirement levels. Also excluded are utilities firms because they are supervised and regulated by the government. Firms with negative revenues are not included. The selection process gives out a sample of 107 firms from the original sample of approximately 200 firms, with 33 state-owned firms (SOE). Firms are across various sectors such as basic material, consumer goods, health care, oil and gas, technology and telecommunications, under ICB classification. From the narrowed list of 107 firms with information available from the 4-year period, a panel data of 302 firm-year observations is constructed for the regression.

3. Variable measurements

Most of the proxies for the determinants discussed earlier are employed in previous research of determinants of cash holdings. Deflation for most financial figures is non-cash total assets at book value since a firm's ability to create profits in the future should be a function of its assets in place (Opler et al., 1999).

- a. *Cash holdings.* Cash holdings level is measured as cash and marketable securities in proportion to the non-cash total assets.
- b. *Growth opportunities.* Since growth prospects are represented by the likelihood of net present value (NPV) projects and growth options are not presented in book value of assets, market-to-book ratio is taken as a proxy for measuring firms' growth opportunities.
- c. *Firm size.* This is measured as the natural logarithm of the book value of total assets.
- d. *Leverage.* Debt-to-assets ratio is used to measure level of firm leverage.
- e. *Dividend payouts.* A dummy set to one for years where a dividend payment is recorded; otherwise, the dummy is zero.
- f. *Cash flow.* Cash flow input in the regression is free cash flow for the year, deflated by non-cash total assets.

- g. *Investment in fixed assets*. This is measured as a ratio of investment in tangible assets to non-cash total assets.
- h. *Profitability*. Return on assets (ROA) is chosen to measure firm profitability.
- i. *Liquidity*. This is measured by using non-cash net working capital, deflated by the non-cash total assets.
- j. *Capital expenditure*. Capital expenditure is measured against non-cash total assets.
- k. *State ownership*. The effect of state ownership is measured by an input of a dummy variable, setting to one if the firm is defined as an SOE with state owning more than 50% of the shares. Otherwise, the variable equals zero.

A summary of the description of these variables and their relationships with cash holdings as discussed in the developed hypotheses is represented in table I. Note that assets in the denominators are book value of total assets less cash and cash equivalent, for the purpose of scaling and deflating the figures.

Table I. Measurements of cash holding and its determinant variables; and their relationship hypotheses

Variables	Model input	Proxies for measurement	Relationship hypotheses
Cash holdings	CASH	Cash and cash equivalent/assets	-
Liquidity	LIQ	(Net working capital – cash and cash equivalent)/ assets	Negative
Profitability	PROF	Operating profit/ assets (ROA)	Positive
Tangibility	TANG	Tangible assets/assets	Negative
Growth opportunities	GROWTH	(Book value of assets - Book value of equity + Market value of equity)/ Book value of assets	Positive
Size	SIZE	Natural logarithm of total assets	Positive
Leverage	LEV	Total debts/ assets	Negative
Cash flow	CFLOW	Free cash flow/ assets	Positive
Capital expenditures	CAPEX	Capital expenditure/ assets	Negative
Dividend payout	DIV	1 if dividend paid; 0 if no dividend paid	-
State-ownership	SOE	1 if % state ownership > 0.5; 0 if state ownership < 0.5	-

4. Regression model and method

4.1 General model

Based on the development of the hypotheses and the measurements of the determinants discussed earlier, the general form of the static model of cash holdings is as follows:

$$CASH_{it} = \alpha_i + \beta_1 CFLOW_{it} - \beta_2 LIQ_{it} - \beta_3 LEV_{it} + \beta_4 MTB_{it} + \beta_5 SIZE_{it} - \beta_6 DIV_{it} + \beta_7 PROF_{it} - \beta_8 TANG_{it} + \beta_9 CAPEX_{it} + \beta_{10} SOE_{it} + \varepsilon_{it}$$

where firms are represented by $i = 1, \dots, N$ and time by $t = 1, \dots, T$. α_i represents the intercept of the model and ε_{it} refers to regression errors.

4.2 Method overview

Multiple regression is carried out on the model with cash being the dependent variable. The regression employs Generalized linear modelling technique (Ordinary least squares method). OLS multiple regression analysis contributes to exploring the extent to which the variability of the dependent variable is explained by a group of predictors. Under this method, critical evaluation and interpretation of the following main output is normally required for:

- (1) *Variable coefficient* (β_1, β_2, \dots). The coefficient of an explanatory variable describes the variance in independent variable that is related to a unit change in that explanatory variable.
- (2) *The fit of the model (R-square)*. R-square represents the proportion of the variability of the independent variable that is accounted for by the changes in the explanatory variables included in the model
- (3) *Significance of the model (F-statistic)*. Analysis of the variance (ANOVA) is also important in evaluating how well the model fits the data. The F-statistic is used for ANOVA analysis, demonstrating the overall significance of the model.

In addition, it is necessary that the principle assumptions for the regression about (i) relationship linearity, (ii) residual independence, (iii) homoscedasticity of the variance and (iv) normal distribution of the errors be not violated for the results not to be biased and misleading, especially when economic implications are made.

4.3 Regression of the model

Based on the overall discussion of OLS method above, the model proposed earlier for this paper is regressed for a cross-sectional analysis of 302 firm-year observations.

Also included in the regression analysis process are additional regressions for industry sector sub-samples. An analysis of the results is dedicated to each of the industry sectors in both economic and institutional context. This is with an aim to give the analysis more insight into cash holdings in relation to industry-specific characteristics and to state ownership for firms in Vietnamese emerging market.

The tool employed is a combination of Excel and SPSS package for regression functions and presentation purposes.

IV. RESULTS

1. Descriptive statistics

In this section, cross sectional panels are constructed to demonstrate how average values move chronologically and differ across various industries. One of the panels is also dedicated to a comparison between SOEs and private firms in terms of cash holdings and firm-specific characteristics.

1.1 Time series, industry averages and sample overview

Table II illustrates the averages for cash holdings and its firm-specific determinants for all firm-year observations. Averages are also shown over the investigated period and across various industry sectors.

As seen in panel A, overall, Vietnamese firms in the sample hold cash at about 8.4% on average, which represents an insignificant difference from the average level 9.9% found by Nguyen (2013) for Vietnamese manufacturing firms. The maximum level detected of cash holdings for this Vietnamese sample, about 40%, is much lower than that for UK firms(Ozkan, 2002), which is about 96.7%.

Chronologically, what is noticeable is the simultaneous, sharp decrease in cash holdings, growth prospects (MTB), liquidity (NWC) and profitability (ROA) for the first two years of the investigated period (2010-2011), as seen in Panel B of the same table. The most significant change can be observed in the level of cash holdings and liquidity in 2011, with the ratios decreasing by 27% for cash holdings while liquidity plunged by 93%. These downward changes in liquidity holdings, market-to-book and profitability ratios can be explained by the negative impact exerted by the financial crisis that officially spread worldwide in 2009-2010. Profitability and liquidity does not improve in 2012 despite an upward, but insignificant trend in the level of cash holdings and growth opportunities. By way of justifying those downward changes in liquidity and profitability from 2010 to 2012, there is an increase in the level of gearing and tangibility for the same period. The observation of these opposite changes is consistent with the inverse association between leverage and liquidity levels found in many previous works in the field regardless of whether it is research on developed or emerging markets. Averages for the most recent year of the investigated period, 2013, shows positive changes in most averages, including profitability, cash holdings, cash flow, growth opportunities, liquidity and tangible. Meanwhile, average leverage level for this year goes down (by 10%), which is again explainable in the same fashion discussed earlier.

Table II. Time series, averages and descriptive statistics

<i>Panel A: descriptive statistics (all firm-years)</i>									
	CASH	SIZE	MTB	LIQ	LEV	CFLOW	TANG	ROA	CAPEX
Mean	0.084	26.958	1.055	0.334	0.309	0.004	0.345	0.101	0.070
Standard Deviation	0.085	1.618	0.678	1.729	0.188	0.178	0.219	0.085	0.079
Minimum	0	20.47	0.26	-2.53	0	-0.36	0	-0.2	0.000
Maximum	0.4	31.44	7.18	20.66	0.86	1.15	0.92	0.48	0.385
<i>Panel B: average values by year</i>									
Years	CASH	SIZE	MTB	LIQ	LEV	CFLOW	TANG	ROA	CAPEX
2010	0.094	26.758	1.243	1.151	0.282	-0.020	0.308	0.119	0.074
2011	0.069	26.932	0.928	0.081	0.322	-0.016	0.354	0.101	0.090
2012	0.077	27.023	0.976	0.060	0.329	0.022	0.350	0.090	0.061
2013	0.103	27.139	1.109	0.064	0.295	0.033	0.371	0.096	0.052
<i>Panel C: average values by industry sector</i>									
Sector	CASH	SIZE	MTB	LIQ	LEV	CFLOW	TANG	ROA	CAPEX
Basic Materials	0.062	27.198	1.095	0.088	0.352	-0.020	0.392	0.099	0.079
Health Care	0.095	26.479	1.126	0.548	0.252	0.057	0.278	0.127	0.064
Oil & Gas	0.158	26.876	0.983	1.139	0.279	0.040	0.348	0.120	0.077
Technology	0.099	26.415	0.860	0.587	0.228	-0.005	0.209	0.053	0.031
Telecommunications	0.150	26.962	0.821	0.124	0.153	0.088	0.231	0.082	0.029

In terms of industry sector, cash holdings averages are highest for Oil & gas and Telecommunications sectors being 15.8% and 15%, respectively. Their differences from the sample averages (8.4%) are relatively significant as they are nearly twice higher. Interestingly, these are sectors of which most firms are state-owned and partly state-regulated. Hence, this can be a signal for potential positive relationship between state ownership and cash holdings. Evidence supporting this relationship is found by Megginson and Wei (2010) for Chinese firms. Corresponding to those high average levels of cash holdings, leverage levels for these two sectors are much lower than those for the other sectors, which again may exhibit the inverse relationship between cash holdings and leverage. Also remarkable is growth prospects for firms of these sectors since they have the lowest averages in the group, which may lead to contradicting what is found between growth prospects and cash holdings in developed markets, but confirming the discussion earlier of the hypothesis between MTB ratio and cash holdings under the impact of agency costs problem (due to state ownership). Cash flows averages for these sectors are also among the highest of the group.

1.2 Cash holding and its variables: SOEs and private firms

Table III illustrates the descriptive statistics for SOE and non-SOE, for the purpose of comparison.

As expected, on average, SOEs hold more cash, as well as debts, than non-SOEs. As discussed earlier, agency costs in SOEs can be significant and mean more cash in the balances. At the same time, historically, SOEs in Vietnam are more able to obtain debts from commercial banks in the country (Nguyen and Ramachadran, 2006) than private firms, which justifies the higher level in averages of debts of SOEs than the others. SOEs are also bigger in size on average; and have more investment in tangible assets. However, despite the higher level in cash holdings, the averages do not exhibit a higher level of growth opportunities for SOEs: Vietnamese non-SOEs have better MTB ratio on average. In addition, the maximum MTB ratio for non-SOEs is as high as 7.18, compared to a merely 2.23 for SOEs. Noticeably, Vietnamese non-SOEs are also higher in terms of maximum level of profitability with 8% difference (at 48%). SOEs, which are mainly composed of by oil & gas and telecommunications firms, have higher level of capital expenditure.

Table III. Descriptive statistics for SOE and non-SOE: cash and its determinants

	CASH		SIZE		MTB		LIQ		LEV	
	Non-SOE	SOE	Non-SOE	SOE	Non-SOE	SOE	Non-SOE	SOE	Non-SOE	SOE
Mean	0.083	0.088	26.904	27.066	1.100	0.964	0.270	0.463	0.304	0.320
Standard Deviation	0.081	0.093	1.474	1.878	0.799	0.302	1.274	2.403	0.187	0.191
Minimum	0.000	0.000	23.640	20.470	0.260	0.330	-2.530	-0.300	0.000	0.010
Maximum	0.340	0.400	30.500	31.440	7.180	2.230	12.780	20.660	0.670	0.860
	CFLOW		TANG		ROA		CAPEX			
	Non-SOE	SOE	Non-SOE	SOE	Non-SOE	SOE	Non-SOE	SOE		
Mean	0.001	0.011	0.310	0.415	0.099	0.105	0.064	0.082		
Standard Deviation	0.191	0.147	0.198	0.243	0.087	0.081	0.074	0.088		
Minimum	-0.360	-0.270	0.000	0.020	-0.200	-0.150	0.000	0.000		
Maximum	1.150	0.510	0.810	0.920	0.480	0.400	0.385	0.385		

To sum up, statistically Vietnamese SOEs are bigger in size, have higher level of capital expenditure, hold more cash and liquidity, obtain more debts and have more free cash flow compared to private firms. However, these private firms in Vietnam seem to fare better in getting higher return on assets and have stronger growth opportunities than SOEs in the same country.

1.3 Correlation analysis

Investigation of correlation is a critical quantitative measure of relationship among variables. Variables' correlation (r) lies between -1 and 1, with positive values indicating a positive correlation between variables and negative values indicating a negative correlation. The larger the positive values, the stronger the positive correlation, and vice versa. Perfect positive (negative) correlation occurs when values of r equals 1 (-1). There is no correlation if $r = 0$.

A correlation matrix illustrating how all variables are correlated in pair is constructed as below.

Table IV. Correlation matrix

	<i>CASH</i>	<i>SIZE</i>	<i>MTB</i>	<i>LIQ</i>	<i>DIV</i>	<i>SOE</i>	<i>LEV</i>	<i>CFLOW</i>	<i>TANG</i>	<i>ROA</i>	<i>CAPEX</i>
CASH	1										
SIZE	0.108	1									
MTB	0.116	0.128	1								
LIQ	0.000	-0.334	0.047	1							
DIV	0.076	0.108	-0.029	0.104	1						
SOE	0.031	0.047	-0.095	0.053	0.192	1					
LEV	-0.281	0.320	-0.133	-0.019	0.024	0.041	1				
CFLOW	0.269	-0.073	0.019	-0.014	0.052	0.027	-0.244	1			
TANG	-0.194	0.001	0.068	0.018	-0.059	0.226	0.120	-0.179	1		
PROF	0.453	0.132	0.196	0.037	0.339	0.032	-0.076	0.227	-0.013	1	
CAPEX	-0.107	0.120	0.024	-0.010	0.124	0.109	0.150	-0.358	0.586	0.180	1

Table IV presents correlation coefficient matrix of paired variables for the sample of this research.

The results show a strong and positive relationship between cash holdings and profitability at 1% significance level, with r as high as 0.45 in absolute value. Cash holdings are also positively correlated in pair with cash flow, state-ownership, dividend payout, liquidity, growth opportunities and firm size at 1% significance level. A strong and negative association is found between cash holdings and asset tangibility, and cash holdings and gearing, with r being 0.28 and 0.19, respectively. Cash holdings also negatively correlate with CAPEX.

Among other variables, strong and inverse correlation is found for liquidity and size, cash flow and CAPEX, dividend payout and profitability, CAPEX and cash flow. All of these pairs have r higher than 0.3 in absolute value.

As for the rest, what is remarkable is the strong and positive correlation between CAPEX and asset tangibility, and between gearing level and firm size.

2. Estimation results

In this section, results of OLS regression running on SPSS 20 software are discussed for all firm-year observations.

2.1 Model fit and estimates overview

Regression on the model gives a value of 34% for R-squared at 5% significance level, suggesting that 34% of the change in cash holding in Vietnamese firms is explained by the variability of the explanatory variables included in the model. The analysis of variance ANOVA tests, with F-statistics of 14.64%, are significant at 0.000.

Table IIIa. Model summary for all firm-year observations

Model Summary^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.578 ^a	.335	.312	.07062	1.908

a. Predictors: (Constant), DIV, LIQ, LEV, MTB, TANG, CFLOW, SOE, SIZE, PROF, CAPEX

b. Dependent Variable: CASH

Table IIIb. ANOVA for all firm-year observations

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.730	10	.073	14.636	.000 ^b
	Residual	1.451	291	.005		
	Total	2.181	301			

a. Dependent Variable: CASH

b. Predictors: (Constant), DIV, LIQ, LEV, MTB, TANG, CFLOW, SOE, SIZE, PROF, CAPEX

In addition, in order to give the regression results more reliability, it is important that the range of variance in residuals is acceptable, which should be around zero value. The acceptable range that is previously considered includes values that do not exceed +/-3 (Med J, 2010). Accordingly, the maximum value for standardized residuals from the regression in this paper is 2.694 and the minimum value being -1.814, as seen in Figure 1 below.

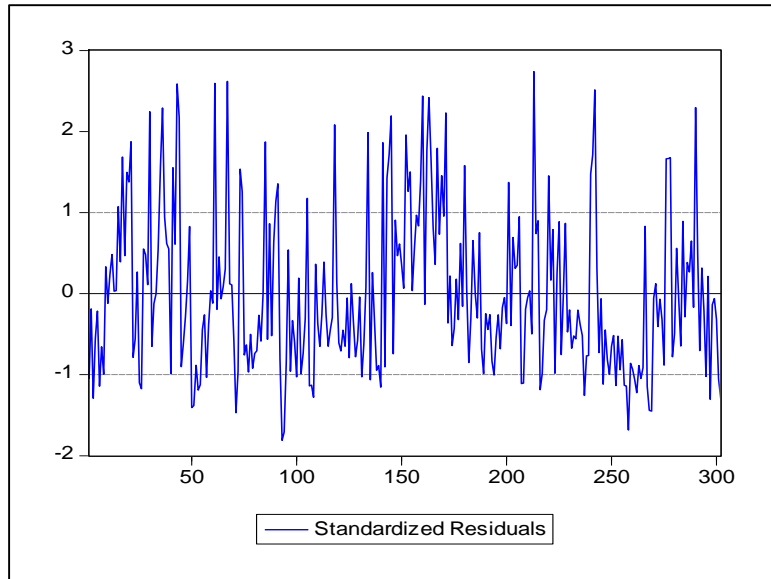


Figure 1. Standardized residuals graph

From the computed OLS estimates, the general form of the regression equation can be rewritten as below:

$$\text{CASH} = -0.12 + 0.008 \cdot \text{SIZE} - 0.001 \cdot \text{MTB} + 0.001 \cdot \text{LIQ} - 1.116 \cdot \text{LEV} + 0.038 \cdot \text{CFLOW} - 0.055 \cdot \text{TANG} + 0.435 \cdot \text{PROF} - 0.057 \cdot \text{CAPEX} + 0.014 \cdot \text{SOE} - 0.018 \cdot \text{DIV} + \text{RESIDUAL}$$

The computed estimates for independent variables confirm predicted signs of most of the hypotheses:

- H1.** *Ceteris-paribus*, there is a negative relationship between leverage and cash holdings.
- H3.** *Ceteris-paribus*, there is a positive relationship between firm size and cash holdings.
- H4.** *Ceteris-paribus*, there is a positive association between profitability and cash holdings.
- H6.** *Ceteris-paribus*, there is an inverse relationship between investment in fixed assets and cash holdings.
- H7.** *Ceteris-paribus*, cash flow and cash holdings are positively related.
- H8.** *Ceteris-paribus*, capital expenditures and cash holdings are negatively related.

The computed estimates for independent variables do not confirm predicted signs of the hypotheses below:

- H2.** *Ceteris-paribus*, cash holdings are positively affected by growth opportunities.
- H5.** *Ceteris-paribus*, there is an inverse relationship between assets liquidity and cash holdings.

The next discussions will shed more light on these results of the model regression, with discussions separated by groups of determinants regarding the extent of their influence on cash holdings for the sample.

2.2 Firm size and profitability

Statistically, firm size and profitability have a significantly positive impact on corporate cash holdings in Vietnam. This confirms hypotheses **H3** and **H4**.

In particular, profitability has a significant coefficient value as high as 0.435. This result is strongly supported by the pecking order theory as discussed above. Some researches on the developed markets, including Tokyo (Nguyen P., 2005) and the US (Opler et al., 1999), confirm this relationship. This positive relationship between profitability and corporate cash holdings is also established by evidence from Nigeria (Ogundipe et al., 2012) and China (Megginson and Wei, 2010). Hence, in specific cases of emerging markets, operating profits can be considered as a favourable source of internal funds for re-financing and re-investment, in the context where the agency costs of debts are higher due to pronounced existence of information asymmetry in these markets, as also discussed earlier. Another possible explanation can be derived from free cash flow theory of Jensen (1986) which depicts agency costs of managerial discretion. This type of agency costs implies excess cash retained by entrenched management in order to pursue their own projects of interest.

As for firm size, its positive association with cash holdings is predicted in consistency with many findings in previous literature for both developed markets and emerging markets (Opler et al., 1999; Afza and Adnan, 2007; Megginson and Wei, 2010; Ogundipe et al., 2012). Thieu (2013) also found the same result for firm size as a positive determinant on cash holdings by manufacturing firms in Vietnam.

2.3 Liquidity, state ownership and cash flow availability

Positive impact, but with level of significance by t-statistics value, is found for liquidity (contradicting hypothesis **H5**), state ownership and cash flow availability (supporting hypothesis **H7**).

Liquidity's positive relationship with cash flow in this research exhibits a difference from results found for developed market (Opler et al., 1999, Ferreira and Vilela, 2004, Kim et al., 2011) as well as for emerging markets (Afza and Adnan, 2007; Megginson and Wei, 2010; Ogundipe et al., 2012; Rizwan and Javed, 2011; Thieu, 2013). Nevertheless, the impact is insignificant with t-statistics as low as 0.827.

As for state ownership its positive impact on cash holdings is consistent with results found for Chinese firms (Megginson and Wei, 2010).

Positive result for cash flow confirms suggestions under free cash flow and pecking order theories when cash is retained for precautionary caution or for management's own interests. This positive relationship of cash flow and cash holdings is strongly supported by empirical studies for different markets.

It should be noted that these impacts are also insignificant at low t-statistics values found in the output.

2.4 Leverage, asset tangibility and dividend payout

The output shows leverage, asset tangibility and dividend payout as strong determinants on cash holdings, negative in coefficient signs and statistically significant in explanatory power.

Among these determinants, leverage demonstrates a strong negative impact on cash holdings for Vietnamese firms. This is consistent with largely found evidence from both developed and capital market (Opler et al., 1999, Ferreira and Vilela, 2004; Afza and Adnan, 2007; Megginson and Wei, 2010; Ogundipe et al., 2012; Rizwan and Javed, 2011; Thieu, 2013). According to Baskin (1987) and Ozkan (2002), the higher the gearing ratio, the lower the cash holdings firms have. In addition, this negative association is theoretically consistent with suggestions from both trade-off and pecking order models.

Asset tangibility, as a determinant, is negatively associated with corporate cash holdings in Vietnam. This determinant also demonstrates a good power of explanation with a relatively high t-statistics value. This result may imply the important role of asset tangibility as favourable collateral for debt raising; hence firms with high level of investment in fixed assets are likely to shift some of its dependence from cash holdings as they are expected to borrow more easily against their tangible assets. The paper on Nigerian market by Ogundipe et al. (2012) supports this view and gives evidence for this negative relationship.

As for dividend payout, which is a dummy variable input in the model, a negative association between this determinant and cash holdings is found from the output of the regression model. This finding can be evidence supporting the argument that dividend payout is one of cash holdings' substitutions (Opler et al., 1999).

These findings confirm hypotheses **H1** and **H6**.

2.5 Growth opportunities and capital expenditures

Results for MTB and CAPEX as determinants in the regression model suggest their negative impact on corporate cash holdings in Vietnam, at a low level of significance.

The negative relationship between MTB ratio and cash holdings level is contrary to what is found from previous researches (contradicting hypothesis **H2**). As discussed earlier, MTB ratio as a reflection of growth opportunities may not be relevant for the purpose in the context of an underdeveloped stock market in Vietnam since the proxy ratio could get less reliable due to imperfections of the market. Noted that its coefficient is at a low value (-0.001) and t-statistics is quite small in absolute value (0.167). Therefore, the negative association of this ratio with cash holdings for this sample does not necessarily reflect the negative relationship between growth prospects and cash holdings of firms in realistic.

Even though the significance level for CAPEX coefficient is also low, its negative sign supports the view that large spending of capital expenditures may result in cash balances drained out. This negative association is also explicable in the way that higher level of capital expenditures leads to higher availability of assets which in turn can effectively serve as collateral against borrowings. Reliance on cash holdings is less pronounced as a result. This supports hypothesis **H5**.

Below is the summary of the findings discussed above.

Table IV. Estimates summary

	Positive	Negative
Significant	Firm size Profitability (ROA)	Leverage Asset tangibility Dividend payout
Insignificant	Liquidity (NWC) State-ownership Cash flow	Growth opportunities (MTB) Capital expenditures (CAPEX)

3. Assumptions testing

In order to ensure that there is no serious bias or misleading in the fit of the model, the confidence intervals, and consequently, economic implications, it is critical that relevant tests be carried out to check if there is any violation in the principle assumptions:

- i. Relationship between dependent and its predictors is *linear*.

- ii. There is no serial correlation among the residuals, i.e. *independence* of the residuals
- iii. Variance of the errors is constant, namely *homoscedasticity*, against time or against any independent variable
- iv. The distribution of the errors is *normal*.

3.1 Multicollinearity test

Multicollinearity occurs when independent variables are co-linear and can make multiple regression results paradoxical. In some cases, results show a high F-test that indicate good fit of the model although none of the predictors has a statistically significant impact on explaining the dependent variable.

One way to check this statistical issue is to look at the correlation matrix, as constructed earlier. Most absolute values of correlations between the variables are well below 0.5, except for correlation between CAPEX and asset tangibility which is slightly higher than 0.5. This supports linearity assumption for the regression model.

However, in addition to co-linearity between one variable with another, it is also possible that there is co-linearity between one variable and a combination of the other variables. In order to detect this problem, a measure for tolerance is employed by the variance inflation factor (VIF) which is reciprocal to tolerance.

Tolerance value lies within the range from 0 to 1. A tolerance value that is near 0 indicates the existence of a linear combination of other variables. Therefore the acceptable tolerance range is between 0.5 and 1. As for the VIF, acceptable range includes values smaller than 2.

Below is a table for the independent variables and their VIFs and tolerance computed using SPSS.

Table V. Tolerance and VIF measure

Coefficients ^a			
Model		Collinearity Statistics	
		Tolerance	VIF
1	SIZE	.787	1.271
	MTB	.884	1.131
	LIQ	.932	1.074
	LEV	.805	1.242
	CFLOW	.744	1.344
	TANG	.577	1.733
	PROF	.728	1.373
	CAPEX	.511	1.956
	SOE	.884	1.131
	DIV	.818	1.222

a. Dependent Variable: CASH

As seen from this table, all the tolerance values are well above 0.5 while all VIF values are smaller than 2 with the maximum value being 1.956. These values of both tolerance and VIF are acceptable.

Together with the conclusion from the correlation matrix above, this test gives strong support to the assumption that there is no multicollinearity among the independent variables of this paper.

3.2 Test for auto-correlation in the residuals

Assumptions for model regression include the independence of errors from each other. Violation of this assumption is mainly detected for time-series data because data is collected for the same variables over time. In this case it is likely that errors for observations in consecutive time periods will be highly correlated with each other. In order to test for correlated residuals, one of the commonly used tools is Durbin-Watson statistic. Durbin-Watson statistic test returns values ranging from 0 to 4. Acceptable values from Durbin-Watson statistic test are normally ones that are approximately 2.

As can be seen from table IIIa for model summary, the Durbin-Watson statistic value for this model is 1.908, which lies in the acceptable range. This leads to the conclusion that there is no violation in the assumption of the independence of errors in the model regression.

4. Industry analysis and state-ownership influence

In addition to firm-specific determinants, industry characteristics are a source of influence on corporate cash holdings. According to Opler et al. (1999), cash holding varies across industry sectors. Therefore, for the purpose of specifically arguing economic implications for the investigated market, more insight is given into cash holding and its determinants for Vietnamese firms at industry level, with regression of the general model previously employed under OLS method. Analysis in this section covers regression results for the industry sectors covered in the sample with the exemption of telecommunications due to the insufficient number of observations for the regression. The industry sectors in question are basic materials, health care, oil and gas and technology.

However, in the context of a SOE-dominated economy, it is critical that the analysis of the model results at industry level take place hand in hand with an evaluation of the impact exerted by state ownership structure. Imperfections in under-developed markets can imply a significant role of state ownership as a source of agency problems, which in turn can affect the level of cash holdings among firms.

The results from the model regression for different industries represent different pictures of cash holding in relation to its determinants. Evaluation of R-square and cash holdings under the effects of the determinants is discussed for each industry sector in the following sub-sections. Implications under economic context as well as institutional context (structure of state ownership) are made in order to add meaning to the quantitative analysis.

4.1 Basic material

R-square value of 36% indicates 36% of the changes in cash holdings for firms in basic material markets is accounted for by the changes in the determinants. The signs of most variable coefficients in the regression output are consistent with the results found earlier for all sample, with profitability, leverage and CAPEX playing a significant role on cash holding determination for Vietnamese basic material firms.

In particular, firm profitability is a positive determinant on cash holdings with a coefficient value as high as 0.438 and has a good explanatory power at less than 1% level of significance. The finding is consistent with the relationship found earlier for the whole sample and confirms the hypothesis **H4**. This solidifies evidence for the argument proposed in the hypothesis that the higher the operating profit the higher balance of cash is retained by firms. As cash is likely to be retained for re-financing operating activities in firms that have higher profitability, proposition of the pecking order theory applies in this case regarding financing hierarchy order. The fact that the majority of these firms are non-SOEs (71%) suggests their management's preference of internal funds over external resources because of the agency costs of debts under information asymmetry in under-developed markets.

Leverage and CAPEX exerts a negative impact on cash holdings for firms of this industry sector, confirming suggestions under the trade-off theory.

Economically, basic material is one of the main contributors to reflecting the economic cycle of Vietnamese economy. This industry sector includes chemistry, forestry and paper, industrial metals and mining. The characteristics of these industries imply requirements for large investments in asset tangibility and CAPEX for operating activities. This matter of fact can contribute to the lowest average of cash holding by this sector (6.9%), since cash is retained when there is more profit coming and then re-injected into re-financing operations and re-investment in asset tangibility and CAPEX. The high requirements of re-financing and re-investments of this sector also mean more debts are likely to be acquired as cash balances get low. Positive but insignificant association between firm size and cash holdings for this sector suggests that larger firms will hold more cash due to the internally financing needs as discussed earlier.

4.2 Health care

As seen from the result summary 54% of the changes in cash holdings for firms in health care sector is explained by the changes in the determinants. However, the results for coefficients and their signs as well as the level of significance do not resemble the results found earlier for the whole sample.

Noticeably, findings for this sector reveal a positively significant relationship between growth opportunities and cash balances, which confirms evidence largely found in previous literature on different markets. Also consistent with evidence found in previous empirical studies is a negative (but insignificant) association between liquidity and cash holdings, even though this result is not in consistent with what found for all sample. Impact of leverage and profitability on cash holding of health care firms is the same with that of basic material firms, which is negative and positive, respectively, but insignificant.

In the institutional context, health care firms in the sample represent only few SOEs (6%). This low presentation of SOEs in the sub-sample for this section can imply a justification for the positively significant relationship between growth opportunities and cash holdings since agency costs of managerial discretion is lower for non-SOEs. In addition, there is support for trade-off model in this case as the findings demonstrate an inverse relationship between cash holding with liquidity, with leverage and with dividend payouts.

4.3 Oil and gas

For oil and gas firms, R-square is relatively high with a value 79%. Some findings on the coefficients and their significance are consistent with those for the whole sample, with size, profitability, dividend playing a statistically significant role in determining cash holdings for firms in this sub-sample.

Statistically, larger oil and gas firms hold more cash than the other firms. Firms with greater profitability tend to retain cash as well. Meanwhile, dividend payout is negatively related to cash holdings for firms in this sector. With low level of significance, growth opportunities and cash flow exert a positive impact on cash holding by these firms. All these findings show consistency with those found by Opler et al., 1999 for the US firms, which suggests that both trade-off and pecking-order theories strongly apply in this case. However, findings about cash holding's relationship with its substitutes (leverage, asset tangibility and CAPEX) reveal a contradiction to the results found for the whole sample. More importantly, those findings also contradict the largely-found evidence on the relationship in previous literature.

Economically, larger oil and gas firms tend to hold more cash on account of their larger scale of business. In terms of corporate governance, oil and gas sector in Vietnam is mainly under the control and regulation of the government. In this sub-sample, 91% of oil and gas firms

are state-owned. This can offer some argument for no findings found about the inverse relationship, between cash holding and its ‘substitutes’ (liquidity, leverage, asset tangibility investment and CAPEX) for Vietnamese firms in this sector, even though it is largely found in previous literature and also found in the regression on the whole sample. Moreover, this sector has the highest holding of cash among the investigated sectors, which is as high as 15.8% on average, nearly doubling the average cash holding for the whole sample (8.4%). Consequently, these results may imply a significant existence of agency problems in these firms when it comes to the trade-off between costs and benefits of holding liquidity, which is normally expected to be a concern to management for the purpose of maximising stockholders’ value.

4.4 Technology

Quantitatively, R-square for this sector is 65%, which means a relatively high proportion of the change in cash holdings by firms in this sector explicable by the change in the investigated determinants. Significantly explanatory determinants found in the output include leverage level and state ownership with signs consistent with those found for the whole sample.

Specifically, a negative association is detected between leverage and cash holding level for technology firms in Vietnam at 1% level of significance. At the same level of significance, state-ownership is also found to be negatively related to cash holding by these firms. Despite being found insignificant in explanatory power, signs for size (+), growth opportunities (-), asset tangibility (-), profitability (+) and CAPEX (-) are similar to those found earlier for all firm-year observations.

Economically, business characteristics of technology firms require a lower level of investment in asset tangibility of CAPEX in comparison with other sectors under investigation. This economic view is statistically relevant since these firms have the highest average value of asset liquidity but the lowest average value of leverage, asset tangibility and CAPEX among the investigated sectors (except telecommunications), as seen in table II of descriptive statistics. These findings in turn lead to the suggestion that Vietnamese technology firms do not financially rely on external funds, because CAPEX and asset tangibility may be seen as a source of collateral availability for debt raising. This is somehow correlated to their low level of gearing. Moreover, the fact that only 15% of technology firms in the sample are SOEs means firms in this sector are less likely to approach external funds due to higher agency costs of debts under information asymmetry. Lastly, the sector has relatively high cash holding ratio (about 1% higher than the sample average) despite its much smaller indicator of investment set (MTB) and a less significant need for asset tangibility investment and CAPEX. As a result, it can be concluded that this sector relies more heavily on liquidity, including cash, rather than external funds. This conclusion, together with the

arguments above, gives support to the pecking order theory regarding the financing hierarchy model.

In short, firm size, profitability and leverage are general powerful determinants for cash holding by firms in basic material, health care, oil and gas, and technology sectors in Vietnam. A large presentation of SOEs in the sector sample (like oil and gas) may result in significant agency costs of managerial discretion, implied by some contradiction in the findings for that sub-sample. In this case, no inverse relationship is found at all between cash holding and such substitutes as liquidity, leverage, tangibility and CAPEX; meanwhile, cash holding ratio of this sector is statistically the highest of all investigated industry sectors. Hence, trade-off model is not at work while free cash flow theory may apply in this case.

A summary of the results of the regressions on the sector samples discussed above is constructed in table VI. Note that diagnostic tests are also carried out for these regressions and the full results of the tests can be found in Appendix B.

Table VI. Results summary for industry sub-samples

Industry	CASH	%SOE	R-square	Positive	Negative	Significant
Basic materials	0.062	29%	36%	PROF, SIZE, CFLOW, SOE	LEV, CAPEX, MTB, LIQ, TANG, DIV	PROF, LEV, CAPEX
Health care	0.095	6%	54%	MTB, CFLOW, TANG, PROF, CAPEX	SIZE, LIQ, LEV, SOE, DIV	MTB
Oil & Gas	0.158	91%	79%	SIZE, MTB, LIQ, LEV, CFLOW, TANG, PROF, CAPEX, SOE	DIV	SIZE, PROF, DIV
Technology	0.099	15%	65%	SIZE, LIQ, PROF, DIV	MTB, LEV, CFLOW, TANG, CAPEX, SOE	LEV, SOE

V. CONCLUSION

In this paper cash holding is investigated in the emerging market of Vietnam which is different in economic and institutional contexts from the developed market. The main purpose of the study is to achieve understanding about why firms hold cash from the Vietnamese market's perspective, which is expected to eventually contribute to the literature on under-researched or partially explored markets. The investigated sample is composed of publicly-traded firms on Ho Chi Minh City and Hanoi stock exchanges in Vietnam, covering a number of key industry sectors during the time between 2010 and 2013. Despite its limited length in time, the selection of the investigated period is carefully considered from the early stage of the study to ensure the availability of data needed, as well as the quality of the data collected, in the context of the late development of the market and the delay of Vietnamese companies in their listings on the official securities exchange floors.

The findings of the research represent some level of consistency between Vietnamese sample and samples from developed markets regarding the significant impact of leverage, dividend payout, profitability and firm size on firms' cash holdings. This consistency is also found in the paper of Al-Najjar (2013) on a group of emerging markets (Brazil, Russia, India and China). Leverage and dividend payout are found to be negatively associated with cash balances, as largely found in empirical studies for different markets. Firms that generate higher operating profit tend to retain cash for their re-financing and re-investing activities; while firms larger in size are likely to hold more cash than the others.

Significant differences from what found in empirical evidence for developed markets include the relationship between market-to-book ratio used as the proxy for investment opportunity sets and cash holdings among Vietnamese firms. With the application of this proxy in the model regression, the study does not find a positive relationship between growth opportunities and cash holdings for the Vietnamese sample even though this positive relationship is widely found in previous literature on other markets. This similarly applies to liquidity, which is not found as predicted by evidence from previous works to be inversely related to cash holdings among firms. Consequently, the expected role of asset liquidity as a substitute for cash is not confirmed in this case. Instead, there is significant evidence supporting the inverse relationship between asset tangibility and cash holding levels for the whole sample. This, in turn, may imply a reliance of Vietnamese firms on asset tangibility for the availability of collaterals to raise debts when cash balances fall short, rather than on liquidity. Moreover, empirical results from papers on capital structure in Vietnam suggest a heavy reliance on short-term borrowings among Vietnamese firms (Nguyen and Ramachadran, 2006). This implies a shift of dependence from liquidity to short-term borrowings as a way of substituting cash in the event of cash shortfall, which somehow supports the inverse relationship between leverage and cash holdings as mentioned earlier.

At the industry level, it is worth remarking that significant variance is detected when firm characteristics are explored for each industry sector regarding the signs of their impact as well as the significance in their explanatory power for cash holdings among sector sub-samples. Due to industry-specific characteristics, firms in sectors that require higher levels of spending on tangible assets and capital expenditures (CAPEX) are likely to have lower levels of cash holding. By way of justifying, cash is used to maintain the internally needed levels of CAPEX and tangibility for continuous operations; hence, cash balance may fall low when required investments increase.

However, regardless of level of significance, impact of profitability, leverage, firm size, cash flow and dividend payout on cash holdings is found to stay almost unchanged in sign for most of the industry sectors under investigation. In particular, the fact that profitability and cash flow are found to remain positive determinants in most of the industry sub-samples serves to solidify the argument that firms in markets with imperfections tend to accumulate cash when they have the opportunity to do so because agency costs of debts in these markets are high due to information asymmetry, if pecking order theory is applied.

In institutional context, the influence of state-ownership is more clearly perceived for the sub-samples that represent a domination of SOEs, which can be seen for firms in Oil and gas sector (91%). The findings for this sector sample do not find significance in explanatory power or consistency with results for other sectors in terms of impact signs when it comes to the associations between cash holding and its 'off-setting' determinants. Statistically, no relevant trend for leverage, liquidity, asset tangibility and CAPEX could be extracted for this SOE-dominated industry sector. More importantly, model regression on this sector sample gives results of positive impact in all the input determinants on cash holding, with an exception of dividend payout. As a result, this may imply the existence of agency costs among these SOEs firms where the trade-off model is not at work. On the other hand, profitability, firm size and dividend payout remains the same level of significance and impact found for other sectors as well as found for the whole sample.

Opposite to the results for oil and gas sector where most of the firms are SOEs, the findings for health care sector, which has the lowest presentation of SOEs in the sub-sample (9%), demonstrate a different picture of cash holding and its determinants. Despite being insignificant determinants, leverage, liquidity and dividend payout are found to be inversely related to cash holdings among health and care firms. Noticeably, health and care firms are the only ones in the sample which have cash holdings significantly increasing with MTB ratio. This significant relationship is not found either for other sectors or the whole sample although it is largely supported by evidence found in previous literature.

Overall, the paper provides further evidence that trade-off, pecking order and agency costs theories all play a critical role in understanding the determination of cash holdings in emerging markets. The paper finds the importance of industrial and institutional settings behind the

differences in cash holding behaviours across various industry sectors in Vietnam. Non-SOEs firms are found to mirror the entire sample better in terms of estimate results; meanwhile, a significant existence of agency problems is found at industry level when there is a domination of SOEs among firms. However, these agency costs are less pronounced when explored on the whole sample. This suggests that in general, agency costs due to state ownership are not severe in Vietnamese market (Thieu, 2013; Nguyen and Ramachadran, 2006).

As a final conclusion, results in this paper contribute to the knowledge of the field through findings about a considerable similarity in the way corporate cash holding is affected by the same financial determinants. Another contribution is further evaluation of how such an institutional factor as state ownership can impact firms' cash holdings in emerging markets, as explored in the Vietnamese context.

Because of the limited availability of data, particularly data for corporate governance indicators at the time of this research, recommendations for research on similar topics for emerging markets in the future should take into account a better inclusion of other internal corporate governance factors such as board structure, audit processes, and CEO characteristics for a thorough understanding of the impact of agency costs on financial decisions of corporations in emerging markets. Ultimately, in order to facilitate future research, it is also critical that corporate governance in Vietnam draw a better attention for it to be properly perceived and applied by the participants in the Vietnamese market. An official quantitative introduction of the first corporate governance index for Vietnamese firms should effectively follow as a result.

REFERENCES

- Afza, T., & Adnan, S.M. (2007). 'Determinants of corporate cash holdings: A case study of Pakistan'. *Proceedings of Singapore Economic Review Conference (SERC) 2007, August 01-04*.
- Al-Najjar, B. (2013). 'The financial determinants of corporate cash holdings: Evidence from some emerging markets'. *International Business Review*, 22, 77-78.
- Anderson, R.W. & Hamadi, M. (2009). 'Large powerful shareholders and cash holding'. *Journal of Financial Economics*.
- Bates, T., Kahle, K. and Stulz R. (2009). 'Why Do U.S. Firms Hold So Much More Cash than They Used To?'. *The Journal of Finance*. LXIV(5), October.
- Campbell, T., & Brendsel, L. (1977). 'The impact of compensating balance requirements on the cash balances of manufacturing corporations: An empirical study'. *The Journal of Finance*, 32(1), 31-40.
- Cossin, D., & Hricko, T. (2004). 'The Benefits of Holding Cash: A Real Options Approach'. *Managerial Finance*, 30(5), 29-43.
- Dittmar, A., Mahrt-Smith, J., & Servaes, H. (2003). 'International corporate governance and corporate cash holdings'. *Journal of Financial and Quantitative Analysis*, 38(1), 111-133.
- Drobetz, W., & Grüninger, M.C. (2007). 'Corporate cash holdings: Evidence from Switzerland'. *Financial markets Portfolio*, 21, 293-324.
- Ferreira, M.A., & Vilela, A.S. (2004). 'Why do firms hold cash? Evidence from EMU countries'. *European Financial Management*, 10(2), 295-319.
- Gill, A and Shah, C (2012): 'Determinants of Corporate Cash Holdings: Evidence from Canada'. *International Journal of Economics and Finance*, 4(1).
- Harford, J. (1999). 'Corporate Cash Reserves and Acquisitions'. *Journal of Finance* 54, 1969-1997.
- Harford, J., Mansi, S. and W. Maxwell (2008). 'Corporate Governance and Firm's Cash Holdings'. *Journal of Financial Economics* 87, 535-555.
- Kim, J., Kim, H., & Woods, D. (2011). 'Determinants of corporate cash-holding levels: An empirical examination of the restaurant industry'. *International Journal of Hospitality management*, 30(3), 568-574.

- Jani, E., Hoesli, M. and A. Bender (2004). 'Corporate Cash Holdings and Agency Conflicts'. *Working Paper*.
- Jensen, M., and W. Meckling (1976). 'Theory of The Firm: Managerial Behavior, Agency Costs and Ownership Structure'. *Journal of Financial Economics*, 3, 305-360.
- Jensen, M. (1986). 'Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers'. *American Economic Review* 76, 323-329.
- Keynes, J.M. (1936). 'The General Theory of Employment, Interest and Money'. In the 1973 edition of the *Collected Writings of John Maynard Keynes*, Vol. 7, edited by Donald Moggridge, London: Macmillan for the Royal Economic Society.
- Meggison, W.L., & Wei, Z. (2010). 'Determinants and value of cash holdings: Evidence from China's privatized firms'. *SSRN Working Paper Series*, 1-37.
- Miller, M. H. and D. Orr (1966). 'A Model of the Demand for Money by Firms'. *Quarterly Journal of Economics* 80, 413-435.
- Myers, S. (1984). 'The capital structure puzzle'. *Journal of Finance*, 39, 572-592.
- Myers, S., and N. Majluf (1984). 'Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have'. *Journal of Financial Economics* 13, 187-221.
- Nadiri, M.I. (1969). 'The determinants of real cash balances in the U.S. total manufacturing sector'. *The Quarterly Journal of Economics*, 83(2), 173-196.
- Opler, T., Pinkowitz, L., Stulz, R. and R. Williamson (1999). 'The Determinants and Implications of Corporate Cash Holdings'. *Journal of Financial Economics* 52, 3-46.
- Pinkowitz, L., and R. Williamson (2001). 'Bank Power and Cash Holdings: Evidence from Japan'. *Review of Financial Studies* 4, 1059-1082.
- Pinkowitz, L., Stulz, R. and R. Williamson (2003). 'Do Firms in Countries with Poor Protection of Investor Rights Hold More Cash?'. *National Bureau of Economic Research, Cambridge, MA*.
- Pinkowitz, L., Stulz, R. and R. Williamson (2006). 'Does the Contribution of Corporate Cash Holdings and Dividends to Firm Value Depend on Governance? A Cross-Country Analysis'. *The Journal of Finance*. Vol LXI, No. 6, December.

APPENDIX 1 Regression for all firm-year observations

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.578 ^a	.335	.312	.07062	1.908

a. Predictors: (Constant), DIV, LIQ, LEV, MTB, TANG, CFLOW, SOE, SIZE, PROF, CAPEX

b. Dependent Variable: CASH

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.730	10	.073	14.636	.000 ^b
	Residual	1.451	291	.005		
	Total	2.181	301			

a. Dependent Variable: CASH

b. Predictors: (Constant), DIV, LIQ, LEV, MTB, TANG, CFLOW, SOE, SIZE, PROF, CAPEX

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.123	.073		-1.679	.094		
	SIZE	.008	.003	.160	2.971	.003	.787	1.271
	MTB	-.001	.006	-.008	-.167	.867	.884	1.131
	LIQ	.001	.001	.041	.827	.409	.932	1.074
	LEV	-.116	.024	-.255	-4.795	.000	.805	1.242
	CFLOW	.038	.027	.080	1.447	.149	.744	1.344
	TANG	-.055	.024	-.142	-2.256	.025	.577	1.733
	PROF	.435	.056	.436	7.774	.000	.728	1.373
	CAPEX	-.057	.072	-.053	-.788	.431	.511	1.956
	SOE	.014	.009	.076	1.499	.135	.884	1.131
	DIV	-.018	.009	-.105	-1.981	.048	.818	1.222

a. Dependent Variable: CASH

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.0470	.2509	.0844	.04925	302
Residual	-.12810	.19026	.00000	.06944	302
Std. Predicted Value	-2.668	3.382	.000	1.000	302
Std. Residual	-1.814	2.694	.000	.983	302

a. Dependent Variable: CASH

APPENDIX 2 Regression by industry sectors

Model Summary^b

INDUSTRY	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
Basic Materials	1	.602 ^a	.362	.324	.06041	2.238
Health Care	1	.733 ^c	.537	.415	.05962	1.933
Oil & Gas	1	.888 ^d	.788	.697	.04810	2.660
Technology	1	.809 ^e	.655	.482	.06155	1.875

a. Predictors: (Constant), DIV, LEV, TANG, LIQ, MTB, CFLOW, SOE, PROF, SIZE, CAPEX

b. Dependent Variable: CASH

c. Predictors: (Constant), DIV, CAPEX, LEV, LIQ, MTB, SOE, CFLOW, PROF, TANG, SIZE

d. Predictors: (Constant), DIV, CFLOW, LIQ, SOE, LEV, TANG, SIZE, PROF, MTB, CAPEX

e. Predictors: (Constant), DIV, LEV, CFLOW, CAPEX, SOE, LIQ, TANG, MTB, PROF, SIZE

ANOVA^a

INDUSTRY	Model		Sum of Squares	df	Mean Square	F	Sig.
Basic Materials	1	Regression	.348	10	.035	9.533	.000 ^b
		Residual	.613	168	.004		
		Total	.961	178			
Health Care	1	Regression	.156	10	.016	4.401	.000 ^c
		Residual	.135	38	.004		
		Total	.291	48			
Oil & Gas	1	Regression	.198	10	.020	8.574	.000 ^d
		Residual	.053	23	.002		
		Total	.252	33			
Technology	1	Regression	.144	10	.014	3.791	.005 ^e
		Residual	.076	20	.004		
		Total	.219	30			

a. Dependent Variable: CASH

b. Predictors: (Constant), DIV, LEV, TANG, LIQ, MTB, CFLOW, SOE, PROF, SIZE, CAPEX

c. Predictors: (Constant), DIV, CAPEX, LEV, LIQ, MTB, SOE, CFLOW, PROF, TANG, SIZE

d. Predictors: (Constant), DIV, CFLOW, LIQ, SOE, LEV, TANG, SIZE, PROF, MTB, CAPEX

e. Predictors: (Constant), DIV, LEV, CFLOW, CAPEX, SOE, LIQ, TANG, MTB, PROF, SIZE

Coefficients^a

INDUSTRY	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Basic Materials	1	(Constant)	-.105	.117		-.899	.370
		SIZE	.007	.005	.119	1.531	.128
		MTB	-.003	.006	-.037	-.561	.575
		LIQ	-.010	.007	-.090	-1.413	.160
		LEV	-.103	.032	-.270	-3.265	.001
		CFLOW	.006	.037	.012	.161	.872
		TANG	-.024	.028	-.073	-.863	.389
		PROF	.438	.065	.506	6.785	.000
		CAPEX	-.158	.078	-.186	-2.018	.045
		SOE	.001	.011	.005	.069	.945
		DIV	-.015	.010	-.101	-1.425	.156
Health Care	1	(Constant)	.369	.212		1.742	.090
		SIZE	-.015	.008	-.296	-1.880	.068
		MTB	.112	.029	.600	3.886	.000
		LIQ	-.001	.002	-.034	-.290	.774
		LEV	-.053	.058	-.118	-.919	.364
		CFLOW	.063	.039	.213	1.611	.115
		TANG	.002	.075	.003	.022	.983
		PROF	.137	.136	.148	1.008	.320
		CAPEX	.067	.186	.054	.362	.719
		SOE	-.017	.049	-.044	-.350	.728
		DIV	-.003	.021	-.018	-.136	.892
Oil & Gas	1	(Constant)	-.566	.111		-5.114	.000
		SIZE	.022	.004	.704	5.483	.000
		MTB	.040	.048	.118	.828	.416
		LIQ	4.037E-005	.001	.003	.029	.977
		LEV	.145	.075	.227	1.929	.066
		CFLOW	.159	.084	.285	1.882	.073
		TANG	.041	.063	.110	.656	.518
		PROF	.351	.148	.310	2.375	.026
		CAPEX	.257	.177	.231	1.452	.160
		SOE	.013	.033	.042	.387	.702
		DIV	-.053	.021	-.286	-2.541	.018
Technology	1	(Constant)	.119	.375		.316	.755
		SIZE	.004	.017	.062	.220	.828
		MTB	-.041	.081	-.117	-.503	.620
		LIQ	.015	.011	.257	1.435	.167
		LEV	-.284	.081	-.585	-3.494	.002
		CFLOW	-.046	.087	-.081	-.529	.603
		TANG	-.050	.099	-.115	-.508	.617
		PROF	.299	.212	.262	1.414	.173
		CAPEX	-.252	.296	-.143	-.850	.405
		SOE	-.116	.036	-.506	-3.233	.004
		DIV	.025	.032	.130	.782	.443

a. Dependent Variable: CASH

Residuals Statistics^a

INDUSTRY		Minimum	Maximum	Mean	Std. Deviation	N
Basic Materials	Predicted Value	-.0439	.2243	.0615	.04421	179
	Residual	-.08813	.20724	.00000	.05869	179
	Std. Predicted Value	-2.384	3.683	.000	1.000	179
	Std. Residual	-1.459	3.430	.000	.972	179
Health Care	Predicted Value	.0116	.2827	.0952	.05709	49
	Residual	-.12511	.14997	.00000	.05305	49
	Std. Predicted Value	-1.465	3.285	.000	1.000	49
	Std. Residual	-2.099	2.516	.000	.890	49
Oil & Gas	Predicted Value	.0368	.4240	.1583	.07754	34
	Residual	-.10461	.07484	.00000	.04016	34
	Std. Predicted Value	-1.568	3.426	.000	1.000	34
	Std. Residual	-2.175	1.556	.000	.835	34
Technology	Predicted Value	-.0191	.2234	.0992	.06919	31
	Residual	-.13950	.14138	.00000	.05026	31
	Std. Predicted Value	-1.709	1.795	.000	1.000	31
	Std. Residual	-2.266	2.297	.000	.816	31

a. Dependent Variable: CASH

Coefficients^a

SOE	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
non-SOE	1	(Constant)	.077	.091		.846	.399
		SIZE	.002	.004	.028	.430	.668
		MTB	-.001	.006	-.007	-.117	.907
		LIQ	.000	.002	-.004	-.066	.948
		LEV	-.118	.029	-.272	-4.117	.000
		CFLOW	.039	.028	.091	1.391	.166
		TANG	-.104	.030	-.253	-3.459	.001
		PROF	.377	.063	.407	5.967	.000
		CAPEX	.013	.087	.012	.155	.877
		DIV	-.014	.010	-.083	-1.303	.194
SOE	1	(Constant)	-.455	.131		-3.474	.001
		SIZE	.019	.005	.392	3.936	.000
		MTB	.035	.030	.113	1.147	.254
		LIQ	.003	.002	.131	1.422	.158
		LEV	-.111	.044	-.228	-2.520	.014
		CFLOW	.038	.066	.060	.581	.563
		TANG	.006	.044	.016	.140	.889
		PROF	.423	.122	.366	3.475	.001
		CAPEX	-.170	.131	-.160	-1.294	.199
		DIV	-.024	.017	-.124	-1.360	.177

a. Dependent Variable: CASH

Residuals Statistics^a

SOE		Minimum	Maximum	Mean	Std. Deviation	N
non-SOE	Predicted Value	-.0429	.2300	.0824	.04940	202
	Residual	-.11954	.20267	.00000	.06436	202
	Std. Predicted Value	-2.536	2.988	.000	1.000	202
	Std. Residual	-1.815	3.078	.000	.977	202
SOE	Predicted Value	-.0787	.3253	.0883	.05858	100
	Residual	-.14220	.15343	.00000	.07221	100
	Std. Predicted Value	-2.851	4.044	.000	1.000	100
	Std. Residual	-1.878	2.026	.000	.953	100

a. Dependent Variable: CASH