DETERMINANTS OF CASH HOLDINGS OF FIRMS LISTED ON THE GHANA STOCK EXCHANGE

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A THESIS SUBMITTED TO THE DEPARTMENT OF ACCOUNTING AND FINANCE KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY SCHOOL OF BUSINESS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
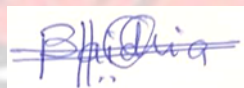
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DECLARATION

I, **OLIVIA MAWUNYO ADZO TIMPO**, hereby declare that this submission is my own work towards the award of a Master of Business Administration, Finance Option and that to the best of my knowledge, it contains no material previously published by another person or any material which has been accepted for the forward of any other degree of the University, except where due acknowledgement has been made in the text.

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DEDICATION

I dedicate this research to my husband (Isaac) and my children (Anaiah, Vaniah, Amariah and Amarissah) and my mom (Olivia), who always cheered me on when I felt like giving up.

ACKNOWLEDGMENT

ABSTRACT

Cash is the lifeblood of every business. This study analyzed the determinants of cash holdings of Ghana-listed companies. The study adopted an explanatory research design. A sample of 21 companies was analyzed from 2010 to 2018. Quantitative data from the financial statements and macro-economic data was obtained. The independent variables were firm size, growth, dividend payout, profitability, liquid assets substitutes, and leverage. The dependent variable was cash holdings, and the control variables were inflation, gross domestic products, and exchange rates. The data were sorted, cleaned, and coded, and then entered in version 15 of Stata. It was observed that profitability and size had a significant positive effect on the cash holdings of non-financial firms. It was also seen that liquidity and leverage had a significant negative effect on the cash holdings of non-financial firms. It was observed in the financial sector that size and growth had a significant positive effect on cash holdings, while dividend payout had a significant negative effect on cash holdings. It is recommended that companies balance cash holding with cash holding expenses for optimal benefit.

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INTRODUCTION

1.0 Background of the Study

Cash is a critical part of a company's balance sheet. Many business books and scholars around the globe have discussed it. Nevertheless, as we talk about cash, the first central question that emerges is: why does a business have cash?

For decades, this topic has attracted curiosity among academics and remains the subject of debate in contemporary financial literature. Maybe that is because of the issue's divisive existence. In a world with optimal financial markets, where capital will still be sufficient to fund new ventures, possessing wealth would not profit. With real-world financial strife, intelligence asymmetry, and transaction costs, the tale becomes more complicated. That is why researchers paid careful attention to holding companies in currency.

Management must raise shareholder wealth in a company. Therefore, businesses should ensure that the cash held level is equal to the cost of cash (Opler et al., 1999). In a world of perfect financial markets, carrying cash is worthless. It is based on Modigliani and Millar's theory, which suggests that where there are no taxes, no bankruptcy costs, no asymmetric details, no litigation options, and an open market, the company is unaffected by the amount of debt, equity, or cash it has. However, financial challenges, information asymmetries, and transaction costs impact the optimum amount of cash keeping. This means that investing in cash holding is very important for companies (Dittmar, Mahrt-

Smith, & Servaes, 2003). For example, it may affect dividend policy or investment opportunities.

The theory of agency explains why the use of cash is generally suboptimal for some companies. Executives may wish to increase the level of cash holding to strengthen their discretion in the company (Opler et al., 1999). According to Dittmar et al. (2003), more money is in companies with agency problems. Agency problems in companies include conflicts between management and corporate shareholders who may have different interests. Dittmar et al. (2003) also showed that in countries where shareholders are not sufficiently protected, companies are twice as effective as in countries where they are well protected. Excessive cash levels can be a danger, as managers can make sub-optimal decisions that can affect a company's value.

Not only can excessive cash accrual cause problems, but too little cash can be detrimental to a company as it can increase its dependence on external financing and lead to high costs (García-Teruel & Martinez-Solano, 2008). The main benefits of investing in cash savings are that companies do not need to raise external funds, avoid paying high-interest payments on these funds and save transaction costs (Opler et al., 1999). Transaction costs may include, for example, investment bankers' fees, attorney fees, commissions for other intermediaries, or information costs. These costs can be very high, so companies want to have sufficient internal liquidity without relying too much on external financing. Cash is a cheap alternative to finance for companies, so they try to reduce external financing costs in incomplete capital markets by keeping more money (Ozkan and Ozkan, 2004).

The main disadvantage of maintaining cash is the lower return on liquid assets compared to other assets or investment projects. Although the return on liquid assets is lower, good cash management is essential for the company. This requires adequate monitoring of debtors, stocks, and creditors. An acceptable cash policy is in the best interests of the company. Bad money management is one of the leading causes of failure. It is known that more companies go bankrupt due to lack of liquidity rather than lack of profitability.

A business can have much income, but it will not go anywhere without an acceptable money management policy. Therefore, cash savings are a significant financial measure to assess a company's financial position. For example, cash is needed to pay employees, suppliers, invest in property and equipment, invest in new technologies, expand into new markets, train employees, make mergers and acquisitions, or pay interest. To your creditors without cash, companies cannot meet their obligations, invest in expansion, or pay their creditors. Under these circumstances, the existence of the company is in danger.

This work focuses on several factors found in the sample companies' financial statements. These factors include the firm's size, net working capital, dividend payments, leverage ratio, cash flow, and cash flow variability. The purpose is to determine whether these variables affect the level of cash holding (positive or negative) and whether these variables are economically significant.

1.1 Problem Statement

Numerous researches have been conducted on the firm's characteristics that appear to play a part in the number of corporate cash reserves. For example, Chudson (1945) recognizes the market in which the company works as an integral element in considering the number of planned cash holdings. Vogel and Maddala (1967) recognize business size as a characteristic that tends to be significant. They find that more prominent companies have lower cash-to-assets and cash-to-sales ratios than smaller peers. In Opler et al.'s (1999) study, approximately a dozen different business features are known to theoretically influence the proportion of cash to total assets in a large sample (about 87,000) of US-based publicly listed companies.

Opler et al. (1999) agree that data confirms the target adjustment model but considers the static trade-off model inadequate to justify the often large sums of cash stored by very profitable companies. Gao et al. (2013) refer to companies retaining cash to minimize transaction costs and control the impact of underinvestment in income shortages. When reviewing the literature on the issue, it is evident that little study has been done focusing on the Ghanaian market and also considering that the regulatory structure of the countries in which these studies were performed is set up differently from Ghana, it is difficult to say if those results are relevant in Ghanaian sense. Ghana research based on corporate governance and cash holdings looked at some aspects of it (Isshaq et al., (2009); Asante, Darko, et al., (2018); Bopkin, (2013). Others focused on operating capital and cash holdings (Yeboah and Agyei, 2012).

Therefore, Ghanaian companies have a knowledge deficit in the determinants of corporate cash holdings. Given that Ghana is the number one fastest growing economy in Africa (MOFEP, 2019), any disparities in qualities that are decisive for Ghanaian corporate cash holdings are justified. Consequently, the aim is to investigate corporate cash holding determinants from a Ghanaian viewpoint contrasting financial and non-financial companies.

1.2 Objective of the Study

The objective of this study is to determine the determinants firm's cash holdings in financial and non-financial firms listed on the Ghana stock exchange. The specific objectives of the study are;

1. To examine the factors affecting cash holdings of non-financial firms,

2. To examine the factors affecting cash holdings of financial firms,

3. To compare the sectorial differences of factors affecting cash holdings.

1.3 Research Questions

1. What are the factors affecting cash holdings of non-financial firms?

2. What are the factors affecting cash holdings of financial firms?

3. What are the sectorial differences of factors affecting cash holdings?

1.4 Relevance of the Study

a) Finance and Treasury Managers

This study will help finance officers and treasury managers to develop the optimum cash holding levels based on the individual firm circumstances.

b) Investment Practitioners

This study should be of use to security analysts, stockbrokers, investors and other parties whose knowledge of the relationship between cash holding and other factors to analyze specific firms.

c) Academicians and Researchers

This study is meant to be a base for further research and as a point of reference; for both academics and researchers for it will provide insight into the characters of the firms quoted on the Ghana stock exchange.

1.5 Scope and Limitations of the Research

This research's objective was narrowed to the determinants of firm cash holdings on companies listed on the Ghana stock exchange. The period was a nine (9) year period ranging from 2010 - 2018. The one obvious limitation of this study is the quantum of data used; published income statements and balance sheets during 2010 – 2018. Secondly, this paper used only secondary data collected from the Ghana stock exchange. This analysis's accuracy and validity depend solely on the exactness, reliability, and quality of the secondary source of data. The findings may be influenced by an estimate and relative measurements for the data source.

1.6 Summary of Methodology

The data for the study is secondary data gathered from firms listed on the Ghana stock exchange. The data covers the period year 2010-2018 which qualifies it as a panel data. The independent variables are firm size, liquid assets, dividend payments, leverage, cash flow, capital expenditure, growth, and profitability. The dependent variable is cash holdings.

1.7 Organization of the Study

This is an overview/summary of how the paper is structured. The research paper is organized into five (5) chapters. The "first chapter discusses background of the study, problem statement, objectives, hypotheses, significance, and scope of the study. The second chapter, contains a review of the literature including, empirical studies on the determinants of cash holdings of a firm. The third chapter deals with research methodology. The fourth chapter presents the data analysis and empirical findings. The last chapter presents the conclusion of the findings and recommendation.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents a review of previous studies on the topic. The section entails a review of conceptual theoretical and empirical review.

2.1 Cash Holdings

Cash is a critical element in daily operations in every business. It provides liquidity for the company and makes the payment of multiple types of bonds. Without adequate cash reserves, an organization will not be able to meet these obligations and must announce bankruptcy sooner or later. Cash reserves are usually listed according to literature as cash and marketable securities or cash equivalents (Opler et al., 1999). Cash equivalents are existing assets that can be replaced by cash in a limited period and are thus too liquid. US treasury bills, savings certificates, banker's deals, etc., are used, for example. These securities are low-risk (Ferreira and Vilela, 2004; Opler et al., 1999; Ozkan and Ozkan, 2004).

If the financial markets were strong, firms would not need to retain liquid reserves but raise foreign resources quickly. As is not the case in the real world, specific ambiguous projections of cash retention are suspected to result in financial friction (Drobetz and Grüninger, 2007). There are, therefore, some fundamental theoretical models that originate from current academic literature and compete to explain the difference between companies in the level of cash stocks.

2.2 The Motives of Cash Holdings

The theoretical history to Keynes (1936) is the reasons for cash holdings. Cash is, he says, held for 4 reasons: money, company, precautionary and speculative reasons. In the following paragraphs, each of the explanations is quickly clarified.

The first reason, which involves wages, is that cash is earned in income. Cash is used to cover bills, in other words. He also points out that the strength of this motivation depends on the income level and the length of the disparity between revenue and expenditure. This explanation indicates that if the revenue is larger than spending and the benefit is reasonably high, the retention power of cash will be increased.

The second motivation, the company motive, is identical to the reason for money. For this cause, cash is withheld from sales proceeds to cover company expenses. It is very close to the wealth motivation, as can be shown. Because of this correlation, the income and market motive are both divided under one heading called an expense motive for transactions (Keynes, 1936).

The third explanation why economic entities such as families, corporations and organizations have cash holdings is the precautionary reason. For this cause, carrying cash supports sudden unexpected spending, but it also helps you to benefit from unpredictable and beneficial buying opportunities. Furthermore another justification for cash retention under the precautionary motive is that a fixed (money) commodity is to be retained to satisfy a fixed (money) obligation that could be accrued in the future.

The strength of the three previous motifs depends in part on whether cash is inexpensive or not and whether these approaches are accurate. Therefore, since it is easy to get cash easily, it is pointless to keep cash. The strength of the first three reasons also depends on the relative cost of keeping currency. In this case, the fact that the capital will only buy a productive commodity results in a rise in holding cash costs and a reduction in the motive power. In the other hand, as it is possible to gain interest and reduce bank fines, this triggers a reduction in the expense of holding cash and provides more incentives to hold cash (Keynes, 1936).

The fourth motive, partially distinct from the first three motivations, is speculative, according to Keynes (1936). Many that have cash for speculative purposes believe they know more than the economy in the future. Therefore, they attempt to make use of this information by keeping currency. The sum of cash kept for the intent and the precautionary intention of the sale results in revenue sums and the general economic structure. Moreover this market for cash is only typically influenced if the general amount of economic operation and revenue is changed.

The motivation of speculation is not necessarily influenced by things but certain key influences. Experiences, on the other hand, demonstrate that those with cash for speculative purposes respond indefinitely as interest rates steadily change. This can be seen as an exception to two major speculative motivational variables (Keynes, 1936).

2.3 Factors Influencing Cash Holdings

This section addresses the major internal factors affecting the cash holdings of firms. They include firm size, liquidity, cash flow, profitability, leverage

2.3.1 Dividend Payout

The trade-off view predicts that distributions of dividends have a negative relationship with cash. From this point of view, dividend cuts can provide funds in the event of liquidity shortages. Dividend increases are expected to be correlated with low prices, and therefore dividend-paying businesses are less likely than non-paying companies to collect capital. Similarly, the hierarchy of finance projects a negative association between distributions and cash holdings. Companies with significant acquisition opportunities that conserve more capital do not pay dividends. Ozkan and Ozkan (2004) suggest, however, that dividend paid companies should raise cash to prevent situations where internal cash balances are not adequate to cover dividends.

2.3.2 Growth Opportunities

The primary aim of corporations is to develop shareholders' equity. To accomplish this aim always, businesses must recognize and seize growth opportunities. A business can grow organically by growing existing goods or increasing its size and profits by purchasing other existing businesses or absorbing or combining existing firms. There is a good association between capital and marketable assets and business growth prospects. This forecast is based on the view that external finance is more expensive for companies

with higher growth prospects and that these growth firms raise more cash to prevent costly external financing.

Hitt et al. (2001) stated that cash was a prevalent finance medium in the 1970s. Nevertheless, in the 1980s, debt was put at the forefront of such funding. However, the high costs for funding debt use in the 1990s drastically diminished to be offset by stock use. Nevertheless, the combination of debt, cash, and inventory was used at the end of 1990. Swiss drug producer Roche agreed to spend around 1.1 billion dollars to purchase Corange, then the number two diagnostic group globally, the parent company of the German firm Boehringer Mannheim GmbH. This was paid in cash because Roche had a 5 trillion Swiss franc cash balance (3.54 Billion US).

Opler et al. (1999) indicate that businesses retain liquid reserves to ensure that they can afford to spend when cash balances are too low instead of expected acquisitions and when outside funds are costly. Moreover, as businesses with high growth chances have a greater demand for capital, they face more expensive external funding to support the opportunities. They, therefore, have higher prices for agencies. It may also be argued that businesses with more significant growth prospects should pay higher costs of bankruptcy. While prospects for growth are capital assets that create value for a business, they cannot be used as leverage or produce current sales. They are immaterial, and their worth is drastically reduced to financial hardship and bankruptcy. A more considerable estimated cost of bankruptcy means that businesses with improved prospects for expansion have more extensive liquidity holdings to escape financial turmoil and bankruptcy.

Myers (1977) found that businesses with precarious debt had these lucrative investment prospects. Moreover, businesses with more enormous investment potential will keep more capital to ensure that they do not give up desirable investment opportunities because of the lack of cash. Dittmar et al. (2002) found that businesses that need more foreign funding benefit more from mature capital markets. They also notice that businesses in sectors with greater external funding reliance have more capital. Interestingly, the impact in countries with insufficient shareholder rights is greatly diminished.

This lack of care for external financial requirements is further proof of the agency's motivation for cash holdings. If corporations had a capital that outside funding is tougher to collect when equity security is thin, we would have wished for the reverse. To encourage businesses' growth potential, the past studies use the stock-to-book ratio, defined as the book value ratio of capital assets minus the book value of equities plus equity market value.

2.3.3 Size

The company's size is represented by the valuation of the properties and the size of its annual turnover. Opler et al. (1999) reported that large companies with improved access to capital markets and high debt scores appear to have smaller cash volumes. They also suggest that there should be economies of scale relative to business size in cash management. It is suggested that bigger businesses are more likely to be diversified and

less vulnerable to financial hardship. In comparison, smaller businesses are most likely to be liquidated in the financial crisis. There was a mistake (Titman and Wessels, 1988).

The statement above indicates a negative association between corporations' size and cash holdings. Faulkender (2003) also observed that small unrated businesses and companies with good acquisition opportunities and more risky cash flows retain more capital. Beltz and Frank (1996) reported that corporations alone have a solid place to consider corporate cash positions, whether calculated by their revenues or total corporate assets. Larger corporations retain a smaller cash share of their properties. There is acceptable proof of company-size economies of scale. This relationship is stable over the years. He also found it impossible to differentiate between revenue and net assets as company size metrics because they appear to play a very similar role in the accounting of corporate cash.

2.3.4 Cash Flow

Myers and Majluf (1984) suggest that businesses appear to follow a hierarchy of their funding practices in the face of asymmetric knowledge and warnings of external funding issues. Companies, therefore, have a preference for foreign financing domestically and debt over equity. Myers and Majluf (1984) also received help from Ouma (2012), who states that a small number of Kenyan businesses use their cash positions to repay long-term debt. Consequently, those businesses with substantial cash balances are anticipated to have more cash to fund any development options. In either way, a favorable relationship between cash flow and cash holdings is required.

On the other hand, cash flow may have a negative effect on corporate cash holdings. Kim et al. (2010) suggest that the cash balance is a ready source of investment liquidity and mature liabilities. Moreover, the probability of lucrative acquisition opportunities and financial instability for businesses with higher cash flows is lower. These businesses can also claim to have smaller capital balances.

2.3.5 Profitability

Profitability is calculated as the net of all sales for one year before taxation after all expenditures. The benefit is the indicator of accounting. The explanation of why profitability is considered one of the company's unique factors influencing cash holdings is that benefit ads relay its consumer credit rating. It also shows the company's growth potential. Profitable businesses will also be in a stronger position to raise support for their cash needs and, therefore, do not require high cash amounts. The reverse is also the case, which encourages lenders and banks not to lend cash to businesses causing losses. Moreover, sustained losses raise the risk of insolvency, and these companies may wish to hold cash for maturity loans and industrial credits to discourage receipt (Opler et al., 1999).

2.3.6 Leverage

The effect of leverage on corporations' cash holding decisions is not evident. On the one hand, if the leverage ratio serves as a metric for companies' willingness to issue debt, then a negative association between leverage and cash holdings is anticipated. This is because businesses will use financing as a replacement for high cash and marketable securities.

Baskin (1987) also suggests that the cost of liquidity-investment funds is rising as the debt-funding ratio rises. In exchange, this means a fall in cash holdings and a rise in capital system debt. However, it should be remembered that higher levels of debt will raise the risk of financial distress. In any scenario, a corporation with a high leverage ratio would expect to raise its capital holdings to mitigate financial distress risk. This will lead to a beneficial partnership between debt and cash.

2.3.7 Liquid Assets substitutes

Ferreira and Viela (2009) claim that all non-cash liquid assets should be used as replacement assets since their fast winding up can provide ready financing at times of need. Liquid assets other than cash can be net working capital. Also, an inventory of businesses can act as a liquid asset when rapidly converted into cash. Therefore, one can deduce that businesses keep less capital and vast volumes of financial assets. Companies may use other liquid assets in addition to cash if they lack cash, and those assets may be known as cash replacements.

2.4 Applicable Theories

Theories related to the study are reviewed below.

2.4.1 Static Trade-Off Theory

Myers' static trade-off principle (1984) suggests that a firm's optimum leveraging ratio is calculated by comparing the new debt finance advantages and disadvantages. Companies must equate the tax gain with mortgage interest rates to financial problems and

insolvency costs. The corporate tax supports equity lending regardless of the tax incentives of debt financing interests.

The incremental cost of cash holdings is a function of capital opportunities leading to low liquid asset yields relative to other assets of comparable risk ratios (Gao et al., 2013). From the shareholder's point of view, empire-building and management advantages may also be a problem, as pointed out by Harford (1999), as managers can tap a huge internal funds pool. The marginal benefits of cash stocks include mitigating financial distress, encouraging an organization's excellent investment strategy, and preventing the expense of liquidating current assets or securing foreign funding (Pinkowitz et al., 2006).

Cash holdings produce advantages and losses in analogy to the debt, and financial contributions are crucial to a business's success. Using the commercial models, a company can easily identify the ideal cash holding level by striking a balance between marginal gains and marginal cash holding costs (Opler et al., 1999). Since businesses need cash to manage their ongoing costs, the most common sources of money are the financial markets or the liquidation of assets. Nevertheless, since asymmetric knowledge means that the stock system is unreliable; businesses also have challenges in joining capital markets and may have to pay high financial costs. Cash holdings are used in the corporate model as a hedge between the company's use and funds sources.

2.4.2 The Pecking Order Theory

The theory of pecking order does not imply an optimal level of capital structure. Myers & Majluf (1984) favors pecking order theory, incorporating assumptions of information asymmetries and transaction costs. Therefore, this hypothesis proposes that companies must follow a funding hierarchy to reduce information asymmetry among the parties.

It argues that firms rank their funding sources, ranging from domestic financing to equity financing, according to the least effort or least resistance principle, preferring to increase equity as a means of last resort funding. Thus, the pecking order theory claims that domestic funds are used initially, and only when all domestic finances are drained will the firm opt for debt. When it is not sensible to want debt, they will eventually become equity as a last resort. Summing up, the theory forecasts that highly profitable businesses that produce high cash flows are expected to use fewer capital than those that produce lesser cash flows.

2.4.3 Free Cash Flow Theory

Jensen's (1986) free cash theory is based on the expenses of an entity arising from the division of ownership and management in a corporation. This division of ownership and control will lead to disputes in this business. Disputes between managers and shareholders or between shareholders and creditors may occur. Jensen & Meckling (1976) describes the relationship between the agency as an arrangement under which one or more individuals (directors) employ another agent to conduct a certain service on its

behalf, requiring the agent's delegation of certain decision-making powers. The Agency costs are described by Jensen & Meckling (1976) as a total of:

1) Tracking expenditures for the principal

2) The agent's bonding cost:

3) Residual costs,

The concern with the agency is primarily present in businesses with high free cash flow. "Free cash flow is more than the cash flow needed to finance all projects that have positive net present values when discounted at the appropriate cost of capital." Managers can use these tools in a subsequent stage to invest in projects to benefit themselves, while they must behave in the best interest of their shareholders. Richardson (2006) observed a greater risk of over-investment in businesses with high free cash flows. The philosophy of free cash flow suggests that management wishes to keep as much cash as possible regardless of their properties. In this scenario, the administrators have control on the investment process.

This power can be disadvantageous for the shareholders as it helps managers to fund projects which damage shareholders' wealth with a negative net present value. The boss's benefit is that instead of increasing foreign debt, he stops managing and tracking the financial markets (Opler et al.) (1999). The probability of reducing this disagreement between agencies is to pay shareholders dividends. Payments for dividends will lead to more outstanding management and regulation of investment opportunities when they ought to go to the financial market.

Another approach is to minimize free cash flow by issuing debt that restricts management's amount of cash and decreases the business's inefficiencies. However, bankruptcy expenses are also synonymous with so much debt, but businesses also have to consider it. The anticipated cost of bankruptcy falls with the debt level, but the business has to hear about this. As described in the Jensen paper (1984), managers are encouraged to let the organization expand beyond its optimum scale. Often this is due to pay that is favorably connected to revenue performance (Murphy, 1985).

2.5 Empirical Studies on Cash Holdings

In this section of the study, previous studies on cash holdings are examined, firm size, growth, cash flow, leverage, payout ratio, profitability, and liquid asset substitute.

2.5.1 Profitability

Dittmar et al. (2003) analyze the impacts on cash holdings in corporate governance and their survey is more than 11,000. They find the relationship between cash holdings and profitability to be good. Furthermore by considering private companies from Italy, Bigelli and Sánchez-Vidal (2012) investigate the problem of cash holdings. They support the opinion of the previous study and note that businesses with more cash are more profitable.

Demir & Ersan (2017) have a favorable impact on cash holdings on profitability. They suggested that these companies have surplus cash holdings and more profitable firms have potentially more acquisition options, and are often more profitable. Another study notes that keeping high-level cash can have a detrimental impact in the short or long-term

on company valuation by low profitability and can also enable businesses to make acquisitions that can be thought of as a value reduction operation. There was a mistake (Harford, et al., 2008). In comparison, the report states that the viability and estimates of corporations with surplus cash and low shareholder privileges are weaker (Harford, et al., 2008).

2.5.2 Liquid Assets substitutes

It is seen that businesses with smaller cash holdings appear to have greater levels of net working capital (Harford, et al., 2008). As net working capital can be used instead of equity and quickly translated into cash, high-level businesses with net working capital tend to hold cash in the lower stages (Dittmar, et al., 2003).

Another analysis also indicates that net working capital has a significant and detrimental effect on cash holdings (Boubakri, et al., 2013). As a consequence of this negative correlation, short-term investments may be used instead of currency. Ferreira & Vilela (2004) provide empirical evidence that the relationship between cash and net working capital is negative. They also state that firms with higher net reserves are also expected to have lower amounts of cash in line with the trade-off model.

In addition, an additional paper of Ozkan & Ozkan (2004) suggesting a negative relation between the above listed variables indicates that non-cash liquid assets can be turned into cash at lower cost than other assets. Due to this, businesses with large net reserves other

than equity may not choose to hold cash at high amounts and they may not prefer capital-market borrowing.

2.5.3 Firm Size

Opler et al. (1999) suggest that the cash and corporate size ratios are adversely correlated. They demonstrate this finding by analyzing data between 1971 and 1994 from publicly traded US firms. They also believe that businesses that can quickly raise capital from stock markets, such as big companies, are not able to retain surplus cash (Opler, et al., 1999).

A further research by D'Mello et al. (2008) explores the topic of cash holding in the context of U.S. spin-offs created by splitting a department or division of a business into a separate company. According to this report, which supports a negative association between surplus cash holdings and corporate sizes, the cost of funding from capital markets is greater for smaller companies (D'Mello et al., 2008).

Dittmar & Smith (2007) analyze the impact of corporate governance on the use and valuation of cash holdings, using 13,095 findings as a final survey from 1.952 U.S. corporations publicly trading in their research. They highlight similar findings and similar explanations for the relation between size and cash level (Dittmar & Smith, 2007). They state that while the cash keeping judgment is adversely influenced by the scale, big corporations prefer to retain more cash than small companies for excess cash reserves.

In comparison, another report considers evolving findings (Demir & Ersan, 2017). In this study, data from Brazil, Russia, India and China was analyzed to explore the relationship between economic policy instability and cash holdings. Their details come from 7007 corporations and are from 2006 to 2015. There is a positive correlation between the size and cash reserves in the pooled results of this analysis.

However the impact of size on cash keeping is positive for only Indian companies but negative for other nations, in view of country specific figures. This is because 54% of their data kit consists of Indian businesses that are comparatively smaller in cash than the companies in Brazil, Russia and China. Owing to the fact that there is a theoretically positive correlation between cash holdings and the scale of these Indian businesses, their outcomes directly impact the pooled results.

2.5.4 Leverage

Guney et al. (2007) examine the problem of cash keeping by 4,069 businesses from Germany, Japan, the UK, France and the USA from 1996 to 2000. They claim that while the relationship between capital and leverage is negative in the lower degree of leverage, the tendency to keep cash is favorable for companies with a higher leverage. They claim that despite the fact that leverage is originally used as an instrument that can be used instead of currency, leverage at higher amounts actually raises the risk of financial difficulties.

The latter statement drives businesses to minimize financial risk by gathering cash (Guney, et al., 2007). Ozkan & Ozkan (2004) share the opinion that the heightened leverage level could also boost cash holdings for the same reasons as the previous report. In addition, they note that the leverage is adversely associated with cash holdings. In addition to the leverage in currency, they also argue that investing is favoured rather than retaining cash, since the cost of leverage in relation to cash reserves is smaller (Ozkan & Ozkan, 2004).

In addition, Al-Najjar (2013) explores cash reserves in four developed nations, Brazil (83), China (494 firms), India (542 companies) and Russia (93 companies), and contrasts these and other companies in the United Kingdom. (204 firms) and the United States (576 companies). The study finds that the leverage and cash keeping for Indian, Chinese and Russian firms are negatively linked, but there is no clear evidence of the effect of the leverage on cash holdings of Brazilian firms (Al-Najjar, 2013). Moreover the result of companies from developed countries is almost equal to companies from developing countries (Al-Najjar, 2013).

The reasons for holding cash between publicly traded entities from Portugal were investigated by Fernandes et al. (2004) and their data comprised 24 firms between 2005 and 2009. The study showed that Portuguese businesses tend to keep their cash down as their debt grows. The explanation for the results is that Portuguese businesses can easily access the funds, especially after entering the European Union (Fernandes, et al., 2004).

This study also notes that businesses tend to borrow rather than accumulate cash because the loan is readily accessible and the costs are modest.

2.5.5 Dividend Payout

Guney et al. (2007) say that the association between cash reserves and the payout ratio is negative. However, Harford et al. (2008) found that the amount of cash keeping and the payout ratio was favorable. If the capital held volume rises, businesses begin to pay dividends at higher rates. In addition, excess cash payment strategies rely on corporate governance. While the businesses that are well controlled tend to pay dividends and pledge to raise dividends in the future, the companies that have worse governance prefer to buy out securities and not guarantee much about potential payouts, such as firmly controlled companies.

Another research by Al-Najjar & Belghitar (2011) uses data in nearly 400 UK, non-financial companies to examine the same topic around 1991 and 2008. In comparison to other research, the relationship between cash reserves and dividends is analyzed differently. They attempt to create a relationship between these variables by taking simultaneity into account (Al-Najjar & Belghitar, 2011). According to the findings, because the cash and dividend holdings have the same determinants and are therefore decided by one another, it would appear that while endogeneity is regulated, they do not dramatically influence one another.

2.5.6 Growth Opportunities

Megginson and Wei (2010) presented a paper on the determination of cash reserves for the Chinese market in a report on the correlation between state ownership and cash holdings between 1993 and 2007. The study indicates that government-controlled businesses have issues with agencies, which reflect a lower valuation of their cash. The study also found evidence of a positive correlation between cash holdings and business size, profitability and growth opportunities. In analysis, cash reserves were shown to be adversely impacted by debt and net working capital.

Nguyen (2005) has researched the theory that cash flows are conservative and help to minimize operating benefit uncertainty. A survey of 9168 firms' annual findings was collected from the Tokyo Stock Exchange between 1992 and 2003. Using regression analysis, their findings revealed that the cash reserves were positively linked to business risk, but were negatively linked to industrial risk. Cash holdings declined with the size of the company and the leverage ratio and improved with its performance, growth potential and a dividend pay-out ratio.

The determinants of corporate cash reserves of non-financial companies in New Zealand were investigated by Hofmann in 2006. He considered the key determinants of growth prospects for corporate cash, the supply of liquid asset replacements, the instability of cash flows, compensation for dividends and debt in New Zealand businesses. Cash reserves are linked favorably to growth and cash flow prospects, while cash holdings are related adversely to high dividend distributions and liquid asset replacement funds.

2.6 Conceptual Framework

Figure one presents the conceptual framework for the study. It displays the dependent and independent variables for the study. The dependent variable is cash holdings, and the independent variables are firm size, liquid assets, growth, profitability, leverage, cash flow, and dividend payment.

Figure one: Conceptual Framework

Independent Variables

Dividend Payout

Size

Growth

Liquid   Assets substitutes

Profitability

Leverage

Control Variables

Inflation

Gross domestic product

Exchange rate

Dependent Variable
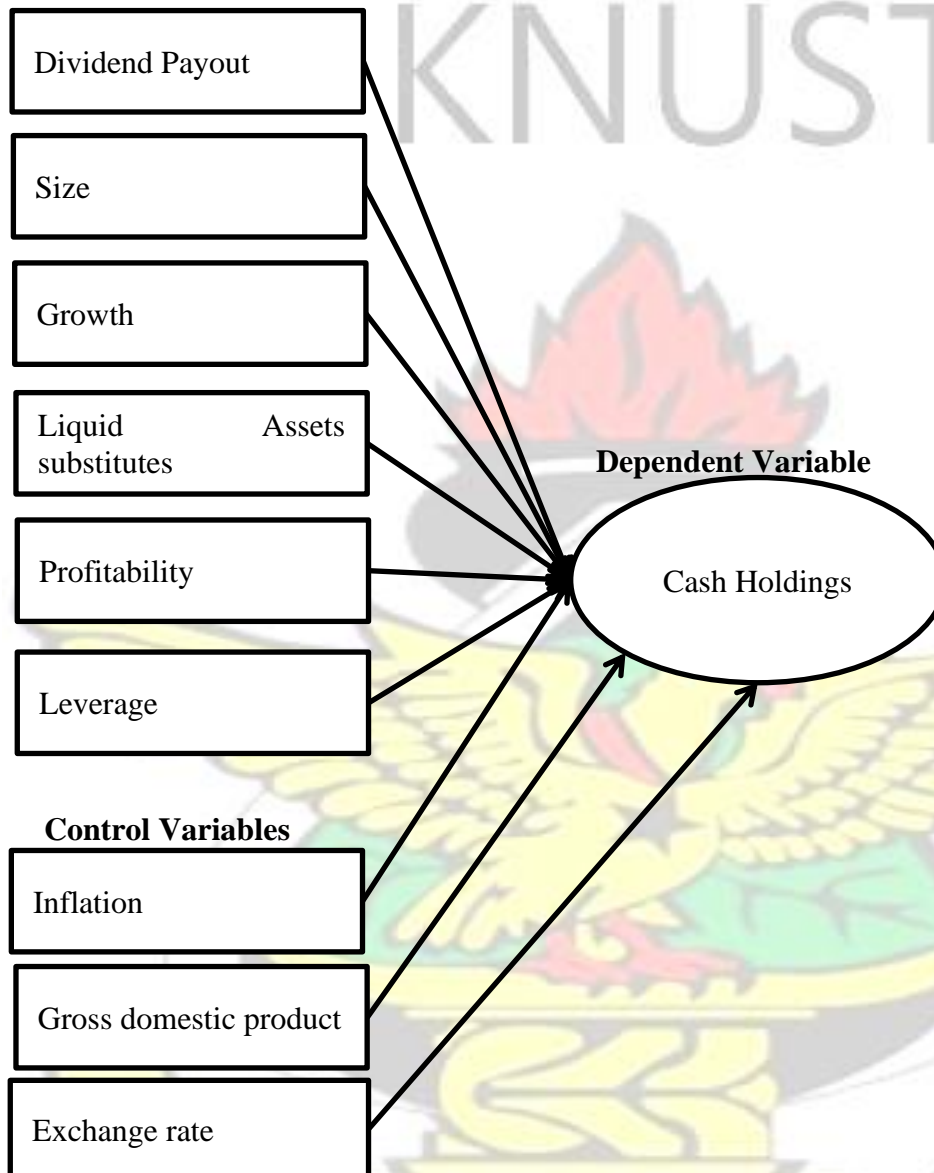
Cash Holdings

Source: Author's construct

2.7 Conclusion

Studies on cash holdings determinants have been conducted worldwide from the literature, but it is evident that such studies have not been conducted in Ghana. This study does seek to contribute to the literature by filling that gap.

RESEARCH METHODOLOGY

3.0 Introduction

This chapter looks at the methodology used to conduct the study. The aspects include discussions on research design, population, sampling, data collection, data analysis, and relativity testing.

3.1 Research Design

Research design is the process of collecting data and analyzing conditions in such a way that combines extreme relevance to meet the purpose of research to be conducted (Kothari, 2017). It is the conceptual structure in which research and data collection and analysis are conducted. This study seeks to explain the relationship making the study and the descriptive study. Desk study fits the design as the study employed a computer to access the data online. The study employed numerical values making the study quantitative.

3.2 Population of the Study

A population usually contains many characters to study suitably, so an investigation is often limited to one or more samples extracted from it. Based on the objective, Ghanaian companies suited this study. For the basis of comparison, companies listed on the Ghana Stock Exchange (GSE) were selected for the current study as the total population.

3.3 Sample Size

The study employed non-financial and financial companies quoted on the Ghana stock exchange. Fourteen companies for non-financial firms and seven companies for financial firms from 2010 -2018 were considered for this research based on convenience. This is because the data was available for the period. Companies whose data were incomplete and those whose currencies were quoted in foreign currencies for the period were excluded (Khidmat and Rehman 2014). Companies were also excluded if they were not listed within the year range (Khidmat and Rehman 2014).

3.4 Data Collection

This study employed secondary data obtained from previous financial reports as published by the companies concerned. The period under consideration was from 2010 to 2018. The data consists of the set of financial statements obtained from the Ghana stock exchange and stock prices. Macroeconomic data was also collected from the World Bank Data Center.

3.5 Data Analysis

Data were analyzed using panel data regression. The regression software was Stata 15. The data set contained information in two dimensions; both the time (2010 - 2018) and in different companies, which correspond to panel data, often used in a situation where data includes both time series and cross-sectional elements (different companies). Panel data regression has some advantages. Firstly, panel information can handle more complex data because they combine both cross-section and time-series data.

This leads to increased rates of freedom and increased test power. Besides, the effect of some of the variables left on the regression can be mitigated from panel regression (Brooks 2019). Gujarati (2004) also pointed out that paneled information can better and measure consequences, which could not be done with clean cross-section or time-series data because panel information provides more information, more significant variation, less variable collinearity, greater efficiency, and better dynamics.

However, panel data has some evaluation and termination problems. Since this information includes both cross-sectional and time dimensions, it is necessary to look at the problem of cross-sectional data (e.g., Heteroscedasticity) and time-series data (e.g., autocorrelation) (Gujurati, 2004), thereby making it quite complicated. Panel data has three models commonly used: pooled regression, the fixed-effects model, and the random-effects model. Several statistical tests are required to determine the most appropriate regression model.

The panel data regression equation is expressed below.

$$\yen_{it} = \alpha + \beta x_{it} + \euro_{it}$$

¥ represents the explained variable which is cash holdings. α represents the constant which is time and cross-section consistent. β is the coefficient. X represents the explanatory variables of the study. ì represents the cross-sectional dimensions which were the number of companies included in the study. t represents the time dimension which was from 2010 - 2018. € is the error term.

3.5.1 Pooled Regression

Brooks (2019) stated that the process of pooled regression begins by testing using the usual ordinary least squares (OLS). This is the most straightforward comparison with panel data. This involves evaluating all the uniform equations, assuming that the variables and their interrelations are constant over time and in all sample cross-sections. This will lead to assumptions about heterogeneity and time-specificity. Thus some information may be left out in the dimension of time and the cross-sectional dimension.

3.5.2 Fixed Effects Model

The fixed-effect model allows the interception of the regression model to differ in cross-section but not overtime. However, all inclination estimates are fixed both in cross-sectional and in time (Brooks, 2019). Even though the fixed effect model is easy to do, there are disadvantages. Gujarati (2004) suggests that the introduction of many dummy variables reduces the degree of freedom. Problems with many variables can also lead to a multicollinearity relationship.

3.5.3 Random Effects Model

Unlike a fixed-effect model, where modeling can reduce degrees of freedom in the case of many cross-sectional units, the random-effect model for each business provides different intercept conditions, and these interceptions are constant over time. The relationship between the explanatory and explained variables is the same for cross-section and time (Brooks, 2019). Thus, it assumes that the company's error rate is not

related to the predictive ones, which allows the time-invariant variables to play as explanatory variables.

3.5.4 Hausman Test

The random-effects model is more suitable if random entities are considered randomly from the population. In contrast, the fixed-effect model is favorable if the sample firms account for the entire population. Since fewer random-effect parameters are valued, and a degree of freedom is retained, the random-effects model contains a more effective estimate than the fixed-effect approach. On the other hand, the Random-effects approach only applies if the mixed error is un-ordered for all explanatory variables. To know the model which is suitable, the Hausman test was done.

3.6 Measurement of Variables

Table 3.0 shows the variables employed in the study and their various measures as per the supporting studies. The independent variables were firm size, dividend payout, growth, profitability, liquid assets substitutes, and leverage. The dependent variable was cash holdings, and the control variables were inflation, gross domestic products, and exchange rates.

3.6.1 Dependent Variable

The variable cash holding was the dependent variable since this paper seeks to evaluate the determinants of cash holdings and their effects. Cash reserves are thus believed to be based on many company-specific variables. The cash ratio was used as a proxy to

calculate cash reserves. Cash reserves are measured using a commonly used method: cash and cash equivalents divided by total assets, close to those used in studies of (Ozkan & Ozkan, 2004).

3.6.2 Independent Variables

The independent variables were firm size, profitability, liquid assets substitutes, leverage, dividend payout, and growth.

3.6.2.1 Firm Size

In line with several previous studies the natural logarithm of total assets is computed as a proxy for real firm size (Ferreira and Vilela, 2004; Opler et al., 1999; Pinkowitz and Williamson, 2001).

3.6.2.2 Leverage

As a proxy for leverage, the ratio of total debt (short-term debt + long-term debt) to total assets was used. This is in line with the majority of previous authors (e.g. Ferreira and Vilela, 2004; Ozkan and Ozkan, 2004; Pinkowitz and Williamson, 2001).

3.6.2.3 Liquid Assets Substitutes

The variable liquid assets substitute was measured as the ratio of net working capital to total assets, because net working capital can be regarded a substitute for cash. In this case net working capital is calculated as Current assets minus current liabilities minus cash

and cash equivalents to net assets (total assets minus cash and cash equivalents). This is in line with previous studies (Opler et al., 1999; Ozkan and Ozkan, 2004).

3.6.2.4 Growth

As a proxy for growth the market-to-book ratio was employed similar to Shah et al. (2012). The market-to-book ratio is measured as the book value of assets – the book value of equity plus the market value of equity divided by the book value of assets.

3.6.2.5 Dividend Payment

In line with Tayem (2017), a dummy variable was established, indicating whether or not the respective firm paid a dividend in a certain year. Here, the dummy variable was assigned a "1" if the respective firm made a dividend payment in the given year and a "0" if otherwise.

3.6.2.6 Profitability

It is found that the firms with more cash holdings are more profitable (Bigelli & Sánchez-Vidal, 2012). Moreover, more profitable firms have potentially more investment opportunities which are also more profitable, such firms have excess cash holdings. Profitability was measured by following Demir & Ersan (2017) as the return on assets ratio (ROA).

3.6.3 Control Variables

The control variables for the study were exchange rate, inflation and gross domestic products.

3.6.3.1 Exchange Rate

The exchange rates for Ghana Cedis for one unit of the US dollar are specified as the value of one country's currency for other countries' currency (World Bank, 2019).

3.6.3.2 Inflation

It reflects a rise in the overall price of goods and services measured using the Consumer Price Index (CPI) (World Bank, 2019).

3.6.3.3 Gross Domestic Product

This is the amount of total value added in the economy for all resident manufacturers plus all commodity taxes and less all incentives other than the value of the goods (World Bank, 2019).

3.7 Model Specification

The study employs a multiple regression model. Similar model was employed by (Shah, 2012; Tayem, 2017)

$$CH_{it} = \alpha + \beta_1 LEV_{it} + \beta_2 INFL_{it} + \beta_3 GDP_{it} + \beta_4 PRF_{it} + \beta_5 LA_{it} + \beta_6 GRW_{it} + \beta_7 SZ_{it} + \beta_8 DP_{it} + \beta_9 EXCHRT_{it} + \text{€}_{it} \dots\dots(1)$$

$$CH_{it} = \alpha + \beta_1 LEV_{it} + \beta_2 INFL_{it} + \beta_3 GDP_{it} + \beta_4 PRF_{it} + \beta_5 LA_{it} + \beta_6 GRW_{it} + \beta_7 SZ_{it} + \beta_8 DP_{it} + \beta_9 EXCHRT_{it} + \epsilon_{it} \dots..(2)$$

$$CH_{it} = \alpha + \beta_1 LEV_{it} + \beta_2 INFL_{it} + \beta_3 GDP_{it} + \beta_4 PRF_{it} + \beta_5 LA_{it} + \beta_6 GRW_{it} + \beta_7 SZ_{it} + \beta_8 DP_{it} + \beta_9 EXCHRT_{it} + \epsilon_{it} \dots\dots.(3)$$

CH is cash holdings, LEV is leverage, PRF is profitability, LA is liquid assets substitute, GRW is growth, SZ is firm size, and DP is dividend payment, INFL is inflation, GDP is gross domestic products, and EXCHRT is exchange rate.

3.8 Reliability and Validity of Data

In the case of validity, the data was gathered from the Ghana stock exchange website.. The websites is the recognized and an accepted place to collect accurate data. In ensuring reliability, several statistical tests were conducted on the data to ensure that the results were not misleading. They include multicollinearity test, serial correlation test, heteroskedsaticity test and normality test.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

This section presents the findings of the study. The variables were discussed descriptively. The numerous tests performed on the data are presented as well as the regression results.

4.1 Descriptive Statistics

Table 4.1 reveals that the mean cash holdings of the financial firms are higher than that of non-financial firms. This is not surprising as financial firms, by their nature, hold depositors cash. A look at the financial and non-financial sectors on profitability shows low profits. The average is around 6%. This indicates that firms under the study are not generating enough profits.

Table 4.1 Descriptive statistics of sectors

	Non-financial				Financial			
Variable	Obs	Mean	Min	Max	Obs	Mean	Min	Max
cashold	126	0.07	0.00	0.89	63	0.15	0.00	0.44
prof	126	0.07	-0.52	0.61	63	0.05	-0.06	0.37
grw	126	2.75	-64.81	35.07	63	1.88	0.13	13.64
Infl	126	12.06	7.13	17.45	63	12.06	7.13	17.45
GDP	126	6.83	2.18	14.05	63	6.83	2.18	14.05
Exchrt	126	2.91	1.43	4.59	63	2.91	1.43	4.59
dp	126	0.07	0.00	1.31	63	0.24	0.00	3.12
liq_assets	126	-0.06	-4.94	0.63	63	-0.07	-1.20	0.67
leverage	126	0.57	0.02	1.43	63	1.53	0.94	1.81
size	126	17.29	12.99	21.45	63	19.83	16.79	21.69

Author's construct. Cashold; cash holdings, prof; profitability, grw; growth opportunities, inflation, gdp; gross domestic products, exchrt; exchange rate, dp; dividend payout, liq_assets; liquid assets substitutes.

Firm growth, which is measured as the market value to book value ratio, is relatively high. From the perspective of the various sectors, it appears that firms have grown over the period. Inflation was relatively high during the period in which this study was studied. This is confirmed by the minimum and maximum inflation figures. This implies that commodity prices were relatively high, which must have affected sales volumes. The average inflation rate was 12%, which is very high, which shows it was difficult for companies to compete in the external market.

The cedi to dollar ratio has been increasing over the years, suggesting that the cedi has been depreciating. On average, the cedi to the US dollar rate is close to GHS3.00, which confirms that firms have been badly affected by the exchange rate. The maximum values of size show that companies have a large asset base on the stock exchange, which confirmed their continued existence in the market.

The liquid asset substitute ratio is represented by the ratio of net working capital (less cash and cash equivalents) to total assets. The average is -0.06% and -0.07%. This is a relatively small number and a bad one due to excluding cash and cash equivalents from the networking capital since cash and cash equivalents are the most significant networking capital. On average, if the cash and cash equivalent are excluded, the amount of limited current assets is higher than the number of short-term liabilities. It is understandable for the financial firms as most of their assets are cash, but it suggests negative equity for the non-financial firms.

The debt level is represented by the leverage ratio. A common rule of thumb is that a good solvability ratio is between 60% and 70%. A look at table 4.2 shows that non-financial firms have an average of 57%, so the average percentage gives a positive sign for the Ghana firms. However, the financial firms' values are relatively high, and this is because of the nature of their business where they operate with customer deposits.

4.2 Multicollinearity Test

Table 4.2 and 4.3 presents the correlation metrics for the study. It is seen from the tables that none of the independent variables are highly correlated. The highest correlation is between inflation and gross domestic products at 0.78. The figure is low to suggest the presence of multicollinearity. The rule of thumb is that if the relationship is above 80%, then there is multicollinearity. However, the relationship between the variables is below 80%.
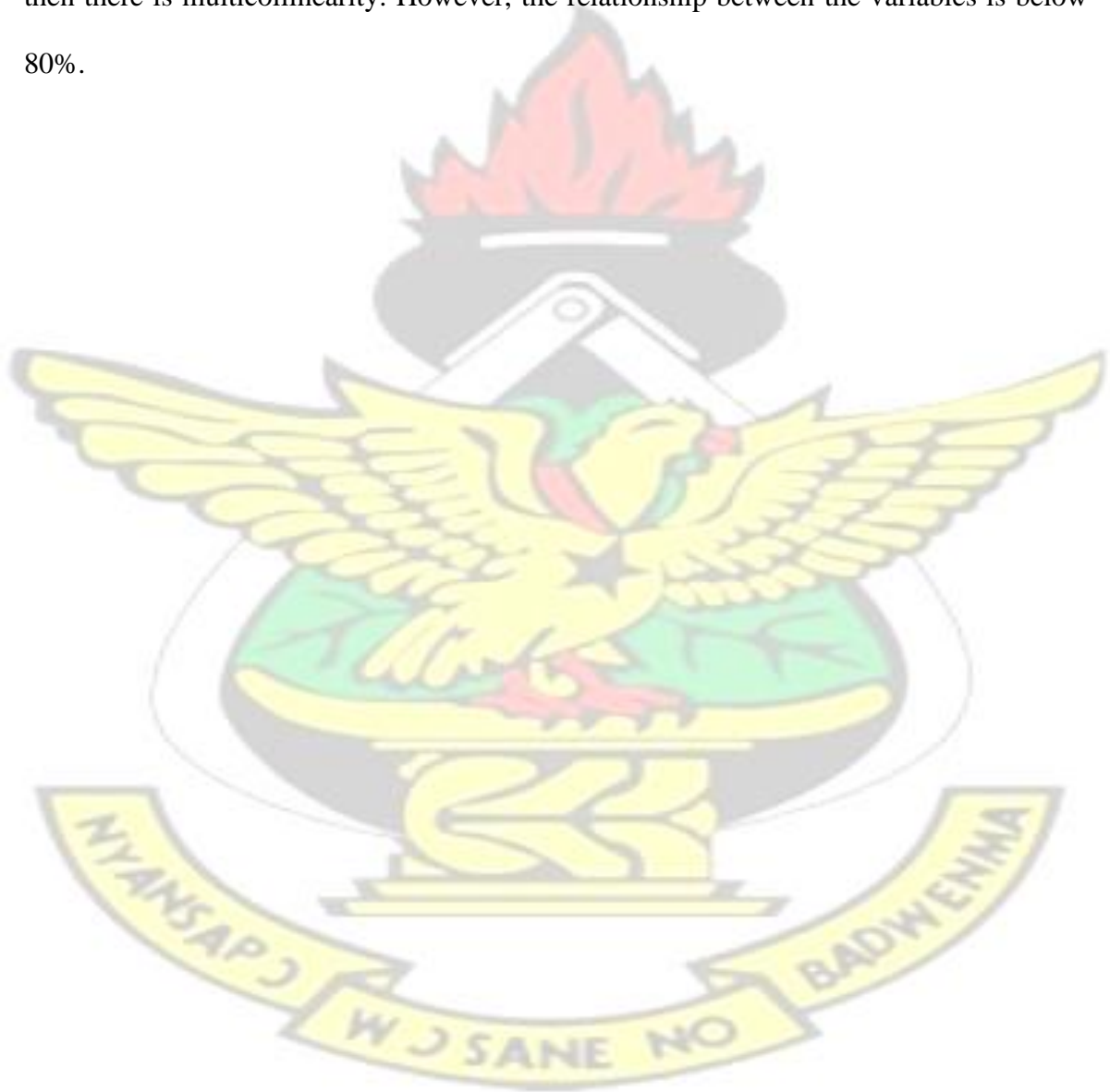
Table 4.2 Pearson correlation-non financial

	cashold	prof	grw	Infl	GDP	Exchrt	dps	liq_assets	leverage	size
cashold	1.00									
prof	0.50	1.00								
grw	0.21	0.29	1.00							
Infl	-0.06	-0.07	0.10	1.00						
GDP	0.03	0.12	-0.07	-0.78	1.00					
Exchrt	-0.13	-0.16	-0.01	0.38	-0.56	1.00				
dp	0.08	0.23	0.08	-0.14	0.17	-0.16	1.00			
liq_assets	-0.65	-0.10	-0.09	-0.12	0.15	-0.09	-0.04	1.00		
leverage	-0.24	-0.48	-0.03	0.04	-0.07	0.05	0.06	-0.29	1.00	
size	0.31	0.40	0.35	0.04	-0.08	0.08	0.30	-0.05	-0.24	1.00

Author's construct. Cashold; cash holdings, prof; profitability, grw; growth opportunities, inflation, gdp; gross domestic products, exchrt; exchange rate, dp; dividend payout, liq_assets; liquid assets substitutes.

Table 4.3 Pearson correlation- financial

	cashold	prof	grw	Infl	GDP	Exchrt	dp	liq_assets	Leverage	size
cashold	1.00									
prof	0.01	1.00								
grw	0.42	0.11	1.00							
Infl	0.14	-0.08	-0.04	1.00						
GDP	-0.16	0.00	0.10	-0.78	1.00					
Exchrt	0.49	-0.17	-0.08	0.38	-0.56	1.00				
dp	0.10	0.16	0.27	0.03	0.06	-0.11	1.00			
liq_assets	-0.46	0.09	-0.13	-0.02	0.10	-0.42	-0.28	1.00		
leverage	0.22	-0.03	0.31	-0.01	0.09	-0.05	0.33	-0.42	1.00	
size	0.50	0.23	0.42	0.10	-0.19	0.21	0.41	-0.40	0.61	1.00

Source: Author's construct. Cashold; cash holdings, prof; profitability, grw; growth opportunities, inflation, gdp; gross domestic products, exchrt; exchange rate, dp; dividend payout, liq_assets; liquid assets substitutes.

4.3 Hausman Test

Table 4.4 presents the Hausman test based on sectors. It is seen that the p-value for the non-financial sector is 0.23 and that of the financial sector is 0.8. since the p-values are above 5%, then the null hypothesis is confirmed, and the random effect model is chosen.

Table 4.4 Hausman test-sectors

non-financial		Financial	
	Hausman test		
stat	11.63	stat	4.6
p-value	0.2351	p-value	0.868

Source: Author's construct.

4.4 Serial Correlation Test

Table 4.5 shows that the p-value for the non-financial sector is above 5%, but that of the financial sector is below 5%. This suggests the presence of serial correlation in the financial sector. This problem is removed using the Driscoll-Kraay covariance matrix estimator developed by Driscoll & Kraay (1998) to obtain heteroskedasticity and autocorrelation consistent standard errors.

Table 4.5 Serial correlation test (wooldrigde) - sectors

	non-financial		Financial
	Serial correlation test		
stat	1.202	stat	17.058
p-value	0.2927	p-value	0.00 ***

*Source: Author's construct. ***: 1% significance level.*

4.5 Heteroskedasticity Test

Table 4.6 shows that the financial sector is homoskedastic (p-value 0.2063), but that of the non-financial sector is heteroskedastic (p-value 0.00). The problem of heteroskedasticity in the non-financial sector is controlled using the Driscoll-Kraay covariance matrix estimator.

Table 4.6 Heteroskedasticity test (Breusch-Pagan test) - sectors

	non-financial		Financial
	heteroskedasticity test		
stat	12.92	stat	1.6
p-value	0.00 ***	p-value	0.2063

*Source: Author's construct. ***: 1% significance level.*

4.6 Normality Test

A look at the sectors in Table 4.7 shows that all the variables for each sector are not normally distributed but since the study sample is large enough, non-normality is not a problem.

Table 4.7 Normality test (Shapiro Wilk test) - sectors

	non-financial			financial		
		normality test				
Variable	Obs	W	p-value	Obs	W	p-value
cashold	126	0.58026	0.00 ***	63	0.8893	0.00 ***
prof	126	0.93276	0.00 ***	63	0.7037	0.00 ***
grw	126	0.47625	0.00 ***	63	0.6198	0.00 ***
Infl	126	0.93737	0.00 ***	63	0.93586	0.00 ***
GDP	126	0.93349	0.00 ***	63	0.93325	0.00 ***
Exchrt	126	0.90617	0.00 ***	63	0.90455	0.00 ***
dp	126	0.38809	0.00 ***	63	0.54134	0.00 ***
liq_assets	126	0.55493	0.00 ***	63	0.94916	0.01 ***
leverage	126	0.97129	0.01 ***	63	0.8714	0.00 ***
size	126	0.93641	0.00 ***	63	0.95463	0.00 ***

*Source: Author's construct. ***: 1% significance level. Cashold; cash holdings, prof; profitability, grw; growth opportunities, inflation, gdp; gross domestic products, exchrt; exchange rate, dp; dividend payout, liq_assets; liquid assets substitutes.*

4.7 Factors Affecting Cash Holdings of Non-Financial Firms

It is seen from Table 4.8 that r-square is 71%, which suggests that the independent variables predict the dependent variable by 71%. From the table, it is seen that the variable profitability has a positive coefficient and a p-value of 0.04. This means the variable has a positive relationship with cash holdings, and the relationship is significant. The results indicate that profitability is a powerful predictor of firm cash holdings.

Table 4.8: Objective One

		non-financial	
cashold	Coef.	Drisc/Kraay Std. Err.	p-value
prof	0.12894	0.05341	0.04 **
grw	0.00023	0.00033	0.52
Infl	-0.00397	0.00204	0.09 *
GDP	-0.00265	0.00180	0.18
Exchrt	-0.01425	0.00186	0.00 ***
dp	-0.00931	0.01554	0.57
liq_assets	-0.14147	0.00888	0.00 ***
leverage	-0.11376	0.03664	0.02 **
size	0.00675	0.00202	0.01 ***
_cons	0.11197	0.05746	0.09 *
R-square	0.71		
obs	126		

*Source: Author's construct. ***: 1% significance level, **: 5% significance level *: 10% significance level, Prof; profitability, grw; growth opportunities, inflation, gdp; gross domestic products, exchrt; exchange rate, dp; dividend payout, liq_assets; liquid assets substitutes.*

Firm growth is positively related to firm cash holdings. The p-value of 0.52 means that the relationship is not significant and, as such, does not predict firm cash holdings. The macroeconomic variables of inflation, gross domestic products, and exchange rate negatively affect firm cash holdings. The p-values of the exchange rate and inflation are below the 10% significant level. However, the p-value of gross domestic product is above 10%. This means the variable does not affect the cash holdings of firms.

It is also seen from the table that leverage and liquid assets substitutes have a significant negative relationship with cash holdings. This implies that as these variables increase, cash holdings decrease, confirming an inverse relationship. Firm size has a significant positive effect on cash holdings. The direct relationship means that as the firm grows in size, cash holdings also grows. The variable dividend payout has a negative coefficient confirming an inverse relationship with cash holdings, but the relationship is not significant.

4.8 Factors Affecting Cash Holdings of Financial Firms

It is seen from Table 4.9 that r-square is 56%, which suggests that the independent variables predict the dependent variable by 56%. From the table, it is seen that the variable profitability has a positive coefficient and a p-value of 0.89. This means the variable has a positive relationship with cash holdings, but the relationship is not significant. The results indicate that profitability is not a powerful predictor of firm cash holdings.

Table 4.9: Objective Two

		financial	
cashold	Coef.	Drisc/Kraay Std. Err.	p-value
prof	0.01788	0.13004	0.89
grw	0.01723	0.00176	0.00 ***
Infl	0.00536	0.00433	0.25
GDP	0.00866	0.00341	0.04 **
Exchrt	0.03380	0.00896	0.01 ***
dp	-0.02539	0.01193	0.07 *
liq_assets	-0.06810	0.03983	0.13
leverage	-0.08269	0.05930	0.20
size	0.02935	0.01291	0.05 **
_cons	-0.55536	0.19250	0.02 **
R-square	0.56		
obs	63		

*Source: Author's construct. ***: 1% significance level, **: 5% significance level *: 10% significance level, Prof; profitability, grw; growth opportunities, inflation, gdp; gross domestic products, exchrt; exchange rate, dp; dividend payout, liq_assets; liquid assets substitutes.*

Firm growth is positively related to firm cash holdings. The p-value of 0.00 means that the relationship is significant and, as such, does predict firm cash holdings. The macroeconomic variables of inflation, gross domestic products, and exchange rate have a positive relationship with firm cash holdings. The p-values of the exchange rate and gross domestic products are below the 10% significant level. However, the p-value of inflation is above 10%. This means the variable does not affect the cash holdings of firms.

It is also seen from the table that liquid assets substitutes have a significant negative relationship with cash holdings. This implies that as the variable increases, cash holdings decrease, confirming an inverse relationship. Firm size has a significant positive effect on cash holdings. The direct relationship means that as the firm grows in size, cash holdings also grows. The variable dividend payout and leverage have a negative coefficient confirming an inverse relationship with cash holdings, but the relationship is not significant.

4.9 Sector Differences on the Factors Affecting Cash Holdings of Firms

The table presents a comparison of the financial sector against the non-financial sector. It is seen from the table that the r-square for the non-financial sector is 71%, whiles that of the financial sector is 56%. This means that in the non-financial sector, the independent variables can explain 71% of the dependent variable's variability. In comparison, they can explain 56% of the variability in the financial sector's dependent variable.

Table 4.10 Objective Three

cashold	non-financial			financial		
		Drisc/Kraay			Drisc/Kraay	
	Coef.	Std. Err.	p-value	Coef.	Std. Err.	p-value
prof	0.12894	0.05341	0.04 **	0.01788	0.13004	0.89
grw	0.00023	0.00033	0.52	0.01723	0.00176	0.00 ***
Infl	-0.00397	0.00204	0.09 *	0.00536	0.00433	0.25
GDP	-0.00265	0.00180	0.18	0.00866	0.00341	0.04 **
Exchrt	-0.01425	0.00186	0.00 ***	0.03380	0.00896	0.01 ***
dp	-0.00931	0.01554	0.57	-0.02539	0.01193	0.07 *
liq_assets	-0.14147	0.00888	0.00 ***	-0.06810	0.03983	0.13
leverage	-0.11376	0.03664	0.02 **	-0.08269	0.05930	0.20
size	0.00675	0.00202	0.01 ***	0.02935	0.01291	0.05 **
_cons	0.11197	0.05746	0.09 *	-0.55536	0.19250	0.02 **
R-square	0.71			0.56		
obs	126			63		

*Source: Author's construct. ***: 1% significance level, **: 5% significance level *: 10% significance level, Prof; profitability, grw; growth opportunities, inflation, gdp; gross domestic products, exchrt; exchange rate, dp; dividend payout, liq_assets; liquid assets substitutes.*

It is seen from the table that profitability has a positive coefficient for both the financial and non-financial sectors. However, the financial sector's effect is significant, implying that cash holdings also increase as profitability increases. Similarly, firm growth is positively related to cash holdings in both sectors. A careful study reveals that the relationship with the financial sector is rather significant.

A study of the macroeconomic variables reveals a sharp contrast. Inflation, exchange rate, and gross domestic product are negatively related to cash holdings, with inflation and exchange rate the significant variables. However, the financial sector's look shows that inflation, exchange rate, and gross domestic products are positively related to cash holdings, with gross domestic products and exchange rate being significant.

Dividend payout had a negative effect on both sectors' cash holdings, with the relationship with the financial sector being significant. It is also seen from the table that liquid assets substitutes and leverage are negatively related to cash holdings for both sectors. It is also seen that their relationship is only significant for the non-financial sector. Firm size is also seen to have a significant positive effect on both sectors.

4.10 Discussion of Results

Size shows significant positive relations with cash holdings for both sectors. This result follows the model of financing hierarchy, where more prominent firms are presumed to have been more robust in the past and have accumulated comparatively more cash than smaller companies. It may also be viewed as an indication of more severe agency issues between management and owners, likely because of empire construction. This observation is consistent with some observational studies (Lian et al., 2011; Song and Lee, 2012).

For the non-financial market, liquid asset substitute had a major negative association with cash holdings. This result suggests that Ghanaian businesses are likely to use their non-

financial reserves as cash replacements. This contributes to the theory that liquid asset replacements are incredibly critical variables in deciding the cash ratio. In this respect, the trade-off model is the only model that assumes liquid asset substitutes. It claims that when a business has large quantities of networking, capital, cash, and cash equivalents are less critical since positive net working capital can quickly be translated into cash by factoring.

The findings of the regression show a positive and significant association between profitability and cash. It is straightforward to explain this result as prosperous (i.e., more profitable) businesses can receive more cash than organizations earning less income. The relationship gives support to the theory of pecking order as businesses with massive cash inflows have a large pool of funds for management to buy and other strategic funding. The agency motive is also apparent as the accumulated cash holdings may serve the purposes of enabling directors to gain enormous control over investment decisions and allow for more managerial perquisites. Amid significant quantities of funds raised, the expectations to perform decrease, enabling top management to pursue "pet" ventures that do not primarily represent the shareholders' interests (Ferreira and Vilela, 2004).

The trade-off theory assumptions found that the association between growth and cash holdings was confirmed empirically with a positive and statistically significant coefficient of 1%. This result reinforces the concept that higher cash levels accumulate more valuable growth prospects to offset the need for better investments. In line with Opler et al. (1999) and Ozkan and Ozkan (2004), further opportunities for growth tend to

contribute to lower disclosure of details, indicating that these businesses' cash distributions are more marginal.

Dividend payouts have a negative impact on financial sector cash reserves. The result reflects Almeida et al.'s corporate liquidity demand hypothesis (2002), which indicates that businesses' option to collect cash depends on their access to capital markets and their estimation of the possibility of potential investment needs. As a result, monetarily constrained businesses (i.e., non-dividend payers) stack up against their cash reserves. At the same time, the financially more secure companies do not weigh this in their cash policy.

Leverage had a negative influence on cash stocks. The Pecking Order Hypothesis also suggested that the proportion of borrowed and cash ratios bear a negative relationship. When investment needs exceed retained earnings, businesses first attempt to fund their investments with cash created internally. If the funds generated internally are not enough, they end up in debt. The decline in cash and the increase in debt has a negative effect on the two variables. This reflects widespread evidence from both developed and capital markets (Opler et al., 1999; Ferreira & Vilela, 2004). According to Baskin (1987), the higher the debt ratio, the lower the liquidity.

In more depth, the study reveals that gross domestic products and cash holdings are substantially positive, which suggests that corporate cash holdings are influenced by

household output growth; as a result, it implies that businesses prefer to keep more cash while gross domestic product is high and vice versa (Chen and Mahajan, 2010).

Inflation has a major negative influence on currency reserves. In inflation, businesses need more resources to buy the same volume of raw materials and other commodities. They also raise less revenue in their operational periods. If prices continue to increase, businesses may expect more inflation and buy raw materials in advance to reduce rising costs or to act as surplus reserves.

Others can invest in gold or immovable properties to prevent purchasing power loss and generate excess income, resulting in firms holding too much work capital and reducing their cash holdings. In financial markets, rising prices will lead to an increase in interest rates and increasing incertitude regarding investment profits, making it less possible for people or institutions to invest in stocks and bonds, thereby increasing equity prices and making raising money more difficult on the capital markets (Friedman, 1977).

The exchange rate's positive coefficient confirms that firms having volatile cash balances on account of exchange rate fluctuations are likely to hold higher cash for precautionary motives. Firms experiencing more considerable changes in their cash and other liquid assets due to changes in exchange rates are likely to hold a higher balance of cash and other liquid assets. Holding higher cash reserves aids in hedging and protects these firms against the adverse impact of exchange market fluctuations on their cash flows.

The negative effect could be explained as in expectation of an increase in the exchange rate; firms hold less cash because the exchange rate changes impact firm profitability, which in turn impacts cash holdings.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents summary of the overall findings of the research, general conclusion and recommendations for further studies.

5.1 Summary of Findings

It was observed that profitability, growth, and size positively affected the cash holdings of non-financial firms. It was also seen that inflation, gross domestic products, exchange rate, dividend payout, liquidity, and leverage negatively affected the cash holdings of non-financial firms.

It was observed in the financial sector that profitability, growth, inflation, gross domestic products, exchange rate, and size had a positive effect on cash holdings. In contrast, dividend payout, liquidity, and leverage had a negative effect on cash holdings.

5.2 Conclusion

The objective of the study was to determine the factors affecting the cash holdings of firms listed on the Ghana stock exchange. The study adopted an explanatory research design. A sample of 21 companies was analyzed from 2010 to 2018. fourteen of firms were non-financial firms whiles 7 of the firms were financial firms. Quantitative data from the financial statements and macro-economic data was obtained. The independent

variables were firm size, growth, dividend payout, profitability, liquid assets substitutes, and leverage. The dependent variable was cash holdings, and the control variables were inflation, gross domestic products, and exchange rates. The data was analyzed using panel data regression technique. The study found that profitability, liquidity and leverage is a significant determinant of cash holdings in the non-financial sector. The study also found that firm size, growth and dividend payout are significant determinants of cash holdings in the financial sector.

5.3 Recommendations

It was established that profitability had a positive effect on the cash holdings firms. Firms operating in the non-financial sector should increase their profitability; this could be achieved by cutting down on cost on unprofitable investments and reducing wages of unproductive staff.

Also, management in the non-financial sector management should reduce taking on of debt. It is found that debt reduces its cash holdings. The study recommends that non-financial companies strive to use retained earnings as a source of funds for their investment. Management should look for other sources of debt to finance their acquisition. In instances where debt is to be taken, management should go for debt with a low-interest rate and invest the funds in positive net present value investments.

It is also recommended that financial firms take significant steps to expand their firms' size as this has the potential to increase their cash holdings. The firm's size could be

increased by management, making efforts to open new branches. Since these firms' cash holdings are determined by deposits of customers, an expansion in size would lead to an increase in cash holdings. Also, management could adopt an aggressive strategy of canvassing for customers to open accounts and deposit funds.

It is also recommended that financial firms review their dividend payout policy. It is found that dividend payout reduces its cash holdings. Therefore, this study suggests that management of these firms take practical steps to increase their firms' value on the stock exchange so that shareholders could benefit from capital gains and instead reduce the dividend payout to the shareholders.

5.4 Recommendation for Further Research

One of the limitations of this study is that it does not test the effects of corporate governance on cash holdings, so future studies can look into it. The study can also be expanded to compare other sub Saharan countries.

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Appendix non-financial

Descriptive statistics

```
. summarize cashold roa MKtbv Infl GDP Exchrt dps liq_assets leverage size_2

    Variable |        Obs        Mean    Std. Dev.        Min        Max

     cashold |        126    .0743424     .106408    .0004914    .8940301
         roa |        126    .0702427    .1404875   -.5174307    .6074985
       MKtbv |        126    2.752023    7.780962   -64.80747    35.07233
        Infl |        126    12.05576    3.702196     7.12635    17.45463
         GDP |        126    6.831391    3.511883    2.178207    14.04712

      Exchrt |        126    2.912635    1.192164    1.429983    4.585325
         dps |        126    .0656811    .1997429           0    1.306826
  liq_assets |        126   -.0607367    .5372177   -4.940399    .6310733
    leverage |        126    .5660253    .2577986    .0213498    1.433133
      size_2 |        126     17.2872    2.464107    12.98668    21.44502
```

Pearson correlation

```
. correlate cashold roa MKtbv Infl GDP Exchrt dps liq_assets leverage size_2
(obs=126)

             |  cashold      roa    MKtbv     Infl      GDP   Exchrt      dps liq_as~s leverage   size_2

     cashold |   1.0000
         roa |   0.4952   1.0000
       MKtbv |   0.2071   0.2862   1.0000
        Infl |  -0.0553  -0.0694   0.0984   1.0000
         GDP |   0.0275   0.1249  -0.0685  -0.7790   1.0000
      Exchrt |  -0.1257  -0.1588  -0.0142   0.3837  -0.5580   1.0000
         dps |   0.0757   0.2323   0.0787  -0.1424   0.1668  -0.1626   1.0000
  liq_assets |  -0.6521  -0.0991  -0.0897  -0.1237   0.1505  -0.0871  -0.0367   1.0000
    leverage |  -0.2364  -0.4795  -0.0313   0.0422  -0.0748   0.0451   0.0591  -0.2860   1.0000
      size_2 |   0.3147   0.4011   0.3513   0.0445  -0.0769   0.0823   0.2961  -0.0513  -0.2416   1.0000
```

Hausman test

```
. xtreg cashold roa MKtbv Infl GDP Exchrt dps liq_assets leverage size_2,fe

Fixed-effects (within) regression            Number of obs      =        126
Group variable: id                           Number of groups   =         14

R-sq:                                         Obs per group:
     within  = 0.6690                                       min =          9
     between = 0.6837                                       avg =        9.0
     overall = 0.6742                                       max =          9

                                              F(9,103)           =      23.13
corr(u_i, Xb)  = 0.0268                       Prob > F           =     0.0000

     cashold |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         roa |   .119341   .0498208     2.40   0.018     .0205332    .2181487
       MKtbv |  -.0000559   .0007225    -0.08   0.939    -.0014889    .0013771
        Infl |  -.0035837   .0021064    -1.70   0.092    -.0077612    .0005937
         GDP |  -.0022437    .002521    -0.89   0.376    -.0072436    .0027561
      Exchrt |  -.0143328    .005072    -2.83   0.006    -.0243919   -.0042736
         dps |   .0224247   .0355388     0.63   0.529    -.0480582    .0929075
  liq_assets |  -.138527   .0109982   -12.60   0.000    -.1603393   -.1167147
    leverage |  -.0586095   .0450837    -1.30   0.196    -.1480223    .0308034
      size_2 |   .0098392   .0090199     1.09   0.278    -.0080497     .027728
       _cons |   .0195883   .1717809     0.11   0.909    -.3210987    .3602752
-------------+----------------------------------------------------------------
     sigma_u |  .0373834
     sigma_e |  .05376498
         rho |  .3258993   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(13, 103) = 2.66                   Prob > F = 0.0030

. estimate store fx

. xtreg cashold roa MKtbv Infl GDP Exchrt dps liq_assets leverage size_2,re

Random-effects GLS regression                 Number of obs      =        126
Group variable: id                            Number of groups   =         14

R-sq:                                         Obs per group:
     within  = 0.6611                                       min =          9
     between = 0.8298                                       avg =        9.0
     overall = 0.7158                                       max =          9

                                              Wald chi2(9)       =     256.44
corr(u_i, X)   = 0 (assumed)                  Prob > chi2        =     0.0000

     cashold |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         roa |  .1289434   .0485342     2.66   0.008     .0338181    .2240687
       MKtbv |   .000227   .0007154     0.32   0.751    -.0011751    .0016291
        Infl |  -.0039736    .002124    -1.87   0.061    -.0081366    .0001893
         GDP |  -.0026547   .0025106    -1.06   0.290    -.0075754     .002266
      Exchrt |  -.0142533   .0050665    -2.81   0.005    -.0241835    -.004323
         dps |  -.0093088   .0310788    -0.30   0.765    -.0702222    .0516045
  liq_assets |  -.1414717   .0106564   -13.28   0.000    -.1623578   -.1205856
    leverage |  -.1137562   .0308491    -3.69   0.000    -.1742194   -.0532931
      size_2 |   .0067479   .0033396     2.02   0.043     .0002024    .0132934
       _cons |   .1119718   .0787667     1.42   0.155    -.0424082    .2663517
-------------+----------------------------------------------------------------
     sigma_u |  .02173517
     sigma_e |  .05376498
         rho |  .14047126   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimate store rx

. hausman fx

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |       fx           rx          Difference          S.E.
-------------+----------------------------------------------------------------
         roa |   .119341     .1289434       -.0096024          .011249
       MKtbv |  -.0000559      .000227       -.0002829         .0001017
        Infl |  -.0035837    -.0039736        .0003899            .
         GDP |  -.0022437    -.0026547        .0004109         .0002291
      Exchrt |  -.0143328    -.0142533       -.0000795         .0002357
         dps |   .0224247    -.0093088        .0317335          .017237
  liq_assets |  -.138527     -.1414717        .0029447         .0027206
    leverage |  -.0586095    -.1137562        .0551468         .0328766
      size_2 |   .0098392     .0067479        .0030913         .0083789
------------------------------------------------------------------------------
                 b = consistent under Ho and Ha; obtained from xtreg
              B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

              chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =        11.63
              Prob>chi2 =      0.2351
              (V_b-V_B is not positive definite)
```

6

Heteroskedasticity test

```
. reg cashold roa MKtbv Infl GDP Exchrt dps liq_assets leverage size_2
```

Source	SS	df	MS		
				Number of obs =	126
				F(9, 116) =	32.97
Model	1.01758661	9	.113065179	Prob > F =	0.0000
Residual	.397747074	116	.003428854	R-squared =	0.7190
				Adj R-squared =	0.6972
Total	1.41533368	125	.011322669	Root MSE =	.05856

cashold	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
roa	.150745	.0500008	3.01	0.003	.0517122	.2497778
MKtbv	.0004962	.000745	0.67	0.507	-.0009794	.0019718
Infl	-.0041843	.0022773	-1.84	0.069	-.0086947	.0003262
GDP	-.0027088	.0026844	-1.01	0.315	-.0080257	.0026081
Exchrt	-.0140833	.0054134	-2.60	0.010	-.0248052	-.0033613
dps	-.029332	.0291493	-1.01	0.316	-.0870659	.0284019
liq_assets	-.1444675	.0107831	-13.40	0.000	-.1658247	-.1231102
leverage	-.1257993	.0261436	-4.81	0.000	-.1775801	-.0740186
size_2	.0060407	.0025668	2.35	0.020	.0009568	.0111246
_cons	.1322874	.0693346	1.91	0.059	-.0050385	.2696133

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
        Ho: Constant variance
        Variables: fitted values of cashold

        chi2(1)     =    12.92
        Prob > chi2 =   0.0003
```

Normality test

```
. swilk cashold roa MKtbv Infl GDP Exchrt dps liq_assets leverage size_2

              Shapiro-Wilk W test for normal data
```

Variable	Obs	W	V	z	Prob>z
cashold	126	0.58026	42.094	8.401	0.00000
roa	126	0.93276	6.743	4.287	0.00001
MKtbv	126	0.47625	52.524	8.898	0.00000
Infl	126	0.93737	6.281	4.128	0.00002
GDP	126	0.93349	6.670	4.263	0.00001
Exchrt	126	0.90617	9.410	5.036	0.00000
dps	126	0.38809	61.365	9.248	0.00000
liq_assets	126	0.55493	44.633	8.532	0.00000
leverage	126	0.97129	2.879	2.376	0.00876
size_2	126	0.93641	6.377	4.162	0.00002

6

Regression results

```
. xtscc cashold roa MKtbv Infl GDP Exchrt dps liq_assets leverage size_2,re

Regression with Driscoll-Kraay standard errors    Number of obs    =       126
Method: Random-effects GLS regression             Number of groups =        14
Group variable (i): id                            Wald chi2(9)     =  21350.28
maximum lag: 2                                     Prob > chi2      =    0.0000
corr(u_i, Xb) = 0 (assumed)                       overall R-squared =   0.7158
```

		Drisc/Kraay				
cashold	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
roa	.1289434	.0534069	2.41	0.042	.0057869	.2520999
MKtbv	.000227	.0003347	0.68	0.517	-.0005448	.0009988
Infl	-.0039736	.0020371	-1.95	0.087	-.0086713	.000724
GDP	-.0026547	.0017968	-1.48	0.178	-.0067981	.0014887
Exchrt	-.0142533	.0018639	-7.65	0.000	-.0185514	-.0099552
dps	-.0093088	.0155416	-0.60	0.566	-.0451479	.0265303
liq_assets	-.1414717	.0088844	-15.92	0.000	-.1619592	-.1209842
leverage	-.1137562	.0366353	-3.11	0.015	-.1982375	-.029275
size_2	.0067479	.0020172	3.35	0.010	.0020963	.0113994
_cons	.1119718	.0574615	1.95	0.087	-.0205348	.2444783

sigma_u	.02173517	
sigma_e	.05376498	
rho	.14047126	(fraction of variance due to u_i)

Appendix Financial

Descriptive statistics

```
. summarize cashold roa MKtbv Infl GDP Exchrt dps liq_assets leverage size_2
```

Variable	Obs	Mean	Std. Dev.	Min	Max
cashold	63	.1540275	.0996929	.0039545	.4448375
roa	63	.0485867	.0528617	-.0639254	.3659754
MKtbv	63	1.881064	1.871654	.1276881	13.6387
Infl	63	12.05576	3.717095	7.12635	17.45463
GDP	63	6.831391	3.526015	2.178207	14.04712
Exchrt	63	2.912635	1.196961	1.429983	4.585325
dps	63	.2399946	.4921955	0	3.116617
liq_assets	63	-.0727935	.3363795	-1.199242	.6737246
leverage	63	1.533615	.2116457	.9361583	1.814317
size_2	63	19.82851	1.303522	16.78923	21.69145

Pearson correlation

```
. correlate cashold roa MKtbv Infl GDP Exchrt dps liq_assets leverage size_2
(obs=63)
```

	cashold	roa	MKtbv	Infl	GDP	Exchrt	dps	liq_as~s	leverage	size_2
cashold	1.0000									
roa	0.0132	1.0000								
MKtbv	0.4185	0.1050	1.0000							
Infl	0.1437	-0.0766	-0.0362	1.0000						
GDP	-0.1636	0.0009	0.1012	-0.7790	1.0000					
Exchrt	0.4853	-0.1672	-0.0801	0.3837	-0.5580	1.0000				
dps	0.1034	0.1556	0.2680	0.0260	0.0563	-0.1121	1.0000			
liq_assets	-0.4577	0.0853	-0.1302	-0.0150	0.1032	-0.2785	1.0000	1.0000		
leverage	0.2199	-0.0271	0.3096	-0.0132	0.0948	-0.0468	0.3283	-0.4193	1.0000	
size_2	0.5025	0.2267	0.4191	0.0959	-0.1908	0.2141	0.4098	-0.3978	0.6070	1.0000

Hausman

```
. hausman fx

                 ———— Coefficients ————
              │      (b)          (B)           (b-B)      sqrt(diag(V_b-V_B))
              │      fx            .          Difference          S.E.
──────────────┼──────────────────────────────────────────────────────────────
          roa │  -.1396457     .0178837       -.1575294             .
        MKtbv │   .014406      .0172342       -.0028282          .0005173
         Infl │   .0054506     .005357         .0000936             .
          GDP │   .007179      .0086599       -.0014808             .
       Exchrt │   .0260132     .0337955       -.0077822             .
          dps │  -.026756     -.0253931       -.0013629          .0041613
    liq_assets│  -.1280143    -.0681015       -.0599128          .0242217
     leverage │  -.1468123    -.0826944       -.064118           .0719258
       size_2 │   .0122922     .0293459       -.0170537          .0136883
```

```
                    b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

      Test:  Ho:  difference in coefficients not systematic

                    chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =        4.60
                Prob>chi2 =      0.8680
                (V_b-V_B is not positive definite)
```

Serial correlation

```
. xtserial cashold roa MKtbv Infl GDP Exchrt dps liq_assets leverage size_2

Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F(  1,       6) =      17.058
            Prob > F =       0.0061
```

Hetroskedasticity test

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
        Ho: Constant variance
        Variables: fitted values of cashold

        chi2(1)    =      1.60
        Prob > chi2 =    0.2063
```

Normality test

```
. swilk cashold roa MKtbv Infl GDP Exchrt dps liq_assets leverage size_2

              Shapiro-Wilk W test for normal data
```

Variable	Obs	W	V	z	Prob>z
cashold	63	0.88930	6.258	3.964	0.00004
roa	63	0.70370	16.749	6.092	0.00000
MKtbv	63	0.61980	21.492	6.631	0.00000
Infl	63	0.93586	3.626	2.784	0.00268
GDP	63	0.93325	3.773	2.870	0.00205
Exchrt	63	0.90455	5.396	3.644	0.00013
dps	63	0.54134	25.927	7.036	0.00000
liq_assets	63	0.94916	2.874	2.282	0.01124
leverage	63	0.87140	7.269	4.288	0.00001
size_2	63	0.95463	2.565	2.036	0.02088