# UNIVERSITY OF GHANA

# OWNERSHIP STRUCTURE AND INVESTMENT CASH FLOW SENSITIVITY OF GHANAIAN LISTED FIRMS

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**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MPHIL FINANCE DEGREE**

**JUNE, 2015**

## DECLARATION

I do hereby declare that this thesis is my original work and has not been presented either in whole or in part for a degree in any institution. In instances where references are made to studies of other researches due acknowledgements are offered. For all misinterpretations and weaknesses that may be identified in this work, I take full responsibility.

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## CERTIFICATION

I certify that this thesis was supervised in accordance with laid down procedures by the University of Ghana.

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**DEDICATION**

This thesis is dedicated to God Almighty,

And to my parents;

Paul and Felicia Ahiadorme

**ACKNOWLEDGEMENTS**

I give praise and thanks to the Almighty God for His exceeding grace throughout my study. To all those who helped me in this work gratitude must be expressed. My heartfelt thanks and appreciation go out to Prof. Joshua Yindenaba Abor and Dr. Agyapomaa Gyeke – Dako, all of the University of Ghana Business School under whose supervision, guidance and mentoring, this work was carried out.

I would like to acknowledge the support of my family; my parents, Paul and Felicia Ahiadorme, and my sisters Eunice and Etornam. I specially thank Mr. and Mrs. Sonyo whose family I have become an integral part. I am ever grateful to my friends, Mohammed Ibrahim Jabir and Delvyn Sinorrita Nunameh for their immeasurable support throughout my studies.

## ABSTRACT

There is overwhelming evidence in empirical literature that in the presence of market imperfections, investments of financially constraint firms become sensitive to the availability of internal finance. There are also contradictory evidences regarding the pattern of the observed investment cash flow sensitivity. However, most of the empirical work on the responsiveness of firms' investment to cash flow was done using data from developed markets. This study examines not just the effect of shareholding classes, but also the effect of debt holdings on the sensitivity of firms' investment to availability of cash flows. For a panel data set of 27 Ghanaian listed firms for the period 2007 – 2013, the study applies the Euler equation approach to the empirical modeling of investment.

This study finds support for the assertion that listed firms face less severe corporate control problems and lower financing constraints and thus have lower investment cash flow sensitivities. However, after interacting cash flow variable with shareholder classes, the cash flow effects on firms' investment become significantly positive. This result is interpreted in the context of corporate governance issues. The study also finds that a significant positive sensitivity of investment to internal funds is associated with firms that have high debt holdings. This is interpreted within the context of liquidity constraints.

This study adds to the empirical literature on the investment cash flow relationship. The study provides evidence on the effect of debt holdings on the investment cash flow sensitivity that has not been documented in the empirical literature. An implication of this study is that firms with high debt holdings are found to face greater challenges in accessing external finance. These firms are likely to experience underinvestment which at a macro level, would translate into lower investments and economic growth for the country.

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# CHAPTER ONE

# INTRODUCION

## 1.1 Background to the Study

Investment decisions and practices have all along received increasing attention in the arena of economics and finance, particularly from researchers and policy makers. Since the surging interest in firms' investment decisions, perhaps starting from Modigliani & Miller, (1958) hereafter M&M, the debate has been underpinned largely by the motivation to identify which model best explains investment behaviours and practices. The debate has not just been limited to models explaining investment tendencies, but also there has been contention as to whether corporate investment decisions are affected by some financial variables or otherwise.

Indeed, researchers have attempted to isolate real firm decisions from purely financial effects in firms' investment decisions. The M&M theorem provides the theoretical basis for the approach to deemphasize the importance of financial considerations in corporate investments when they argue that for real investment, financial structure and policies are irrelevant under the conditions that there are no taxes and also there are well functioning capital markets. M&M provide insights that in a perfect market, the market valuation of a company does not depend on its financial and capital structure. The case is that if the M&M assumptions are granted, then real firm decisions say, corporate investments (perhaps motivated by shareholders' claims maximization) are independent of financial considerations such as "internal liquidity, leverage or dividend payments" (Fazzari, Hubbard & Petersen, 1988). In furtherance of this argument, Fazzari, Hubbard & Petersen, (1988) document that the findings by M&M provided the basis for the neoclassical theory of investment advocated by Jorgenson (1963) and others, "in which the firms' intertemporal optimization problem could be solved without reference to financial

factors". These models detail that firms are actually assumed to face "a cost of capital" (rates of interests) which is determined in "centralized securities markets" and is not affected by the firm's particular financial structure. Thus, investment spending is determined mainly by taxes and real interest rates. The neoclassical theory of investment is seen (Carpenter & Guariglia, 2003) to be reformulated only by the Q-theory of investment attributed to Tobin (1969) and later advocated by Hayashi, (1982). Essentially, neither the Q-theory nor the neoclassical suppositions recognized the role of financial variables in firms' investment decisions (Carpenter & Guariglia, 2003).

The M&M proposition does imply that, external and internal funds perfectly substitute for each other on the assumption of a perfect capital market (Kadapakkam et al. 1998). But is that really the case in practice? Contrary to the neoclassical theories of investment (and later the Q-theory), the financial effects on many aspects of real economic activity received substantial attention and Meyer & Kuh (1957) specifically emphasize the relevance of financial variables for corporate investment and indeed the apparent firms' preferences for internal finance. Thus, in sharp contrast to the M&M proposition, the relevance of financial variables in firms' investment decisions ensures that internal and external finance are not perfect substitutes in practice. Fazzari, Hubbard & Petersen, (1988), assert that it is imperative to identify reasons why internal and external finance are not perfectly substitutable in any effort to provide "a microfoundation for links between a firm's financial structure and its real investment spending". In fact, internal finance may just be less costly than external finance. Among the explanations for the relatively inexpensive internal finance are costs of transaction, agency problems, asymmetric information problems, tax advantages, and costs of financial distress. Indeed the development of theoretical models of asymmetric information is trail-blazed by a landmark study by Akerlof (1970) on the

problem of asymmetric information and its role in the market for "lemons" (Carpenter & Guariglia, 2003). Asymmetric information problems potentially can generate significant cost disadvantages of external finance. The asymmetric information problem illustrates malfunctioning markets that are antecedent by buyers and sellers operating under different sets of information. The core of the argument is that access to information is actually not the same for all market participants and that insiders for instance, have rather detailed information about "corporate strategic decisions"; an information outside investors are not privy to (Kadapakkam, Kumar & Riddick, 1998). Myers & Majluf (1984) provide evidence that in the presence of asymmetric information problems, outside investors will price "risky securities" lower than otherwise would have been and consequently increasing the cost of accessing external finance. This ultimately accounts for the "wedge" between internal and external finance. Other researchers (e.g., Stiglitz & Weiss, 1981) recognize that similar reasoning could be adduced for firms that seek funds from lenders. Hence firms are confronted with a "pecking order", a "financing hierarchy" a hierarchy of cost of funds where the use of internal funds provides the opportunity for the firm to eschew the high costs associated with external finance. Thus, a firm with greater cash flow will all things being equal, depend less on the relatively expensive external financing and (Carpenter & Guariglia, 2003) should also be considered by lenders as being less risky.

Eventually, corporate investments can be financed with either internal or external funds. Of course, internal funds do have an opportunity cost, which should equal the cost of capital.

The presence of "information, agency, or risk aversion problems" ensures that external funds are associated with an additional cost, "a deadweight cost" (which the issuing firm pays in a competitive capital market) and that represents a wedge between the costs ascribed to internal

and external funds (Kaplan & Zingales, 1997). If indeed the cost of funds differs by the source of funds, then the availability of internal finance will, most likely affect the investment practices of some firms and in the financing hierarchy models, relatively low cost sources of funds will be preferred and used first (with regard of course "to maintaining a target capital structure"). Even if equity financing is the preferred choice, internal equity will be desirable since it is cheaper (Kadapakkam, Kumar & Riddick, 1998). So, investments are sensitive to internal funds (which are cheaper) in an imperfect capital market; while in a perfect capital market (according to the M&M proposition), they are not since there are no differentials between the costs of internal and external sources of funds. In fact, agency problems may further accentuate the investment and internal funds relationship since "irrational or overly risk-averse" managers may despite the option of low cost funds choose to primarily use internal funds for investment (Kaplan & Zingales, 1997).

## 1.2 Statement of Research Problem

In 1988, Fazzari, Hubbard & Petersen published a prominent study depicting a relationship between investment and internal funds and ever since; there have been plethora of empirical studies (e.g. Kadapakkam, Kumar & Riddick, 1998; Goergen & Renneboog, 2001; Laeven, 2003; Mizen & Vermeulen, 2005; Degryse & de Jong, 2006; Aggarwal & Zong, 2006; Wei & Zhang, 2008) providing evidences of the sensitivity of investment to cash flows. The research of investment – cash flow sensitivity has not been without controversy despite the generally observed positive relationship. The controversy has been what factors explain the observed relationship between investment and cash flows. There are largely two alternative explanations. According to the asymmetric information problem explanations, (e.g. Myers & Majluf, 1984), the sensitivity is an indication that external fund is just too expensive relative to internal fund.

The free cash flow hypothesis advocated by Jensen (1986) on the other hand suggests that investments' sensitivity to cash flows is not due to the rather expensive nature of external capital, but because managers have the inclination to overinvest their free cash flow.

In their seminal work, Fazarri, Hubbard & Petersen (1988) report that the investment cash flows sensitivity is stronger for firms that have high financial constraints. They proxy financial constraints with dividend payout and present evidence that firms that have low dividend payout (high financial constraints) have higher investment – cash flows sensitivities than high dividend paying firms. Several studies have since documented findings in line with those by Fazarri, Hubbard & Petersen (1988), using data from a variety of contexts and other factors perceived to be accounting for the variations in firms' financing obstacles. Whited (1992) reports that the prevalence of asymmetric information problems in debt markets inhibits financially unhealthy firm's capacity to obtain external finance. Gertler & Gilchrist, (1994) and Gilchrist & Himmelberg (1995) all find excess sensitivity of corporate investment to internal funds for small firms than larger firms (firm size was used to explain variations in firms' financing obstacles). Kato et al. (2002) detect that for Japanese group affiliated firms (firms likely to have low financing constraints) there are significantly lower investment – cash flow sensitivities. Moyen (2004) documents results showing high investment – cash flow sensitivities for firms that have high financial constraints when he classifies as financially constrained, firms with low cash flows and those with investment policy that exhausts internal funds. Mizen & Vermeulen (2005) demonstrate that firms with level of investments that are relatively less sensitive to internal funds availability are positioned in industries with sound financial performance and thus experience less difficulty obtaining external capital.

Kaplan & Zingales (1997, 2000) offer a challenge to these interpretations and insist that a justification of investment – cash flow sensitivities as evidences of financial constraints only distracts attention from the more important question as to what exactly causes the sensitivity. Indeed Cleary (1999), Kaplan & Zingales (2000) and Almeida & Campello (2001) find evidence contrary to the observed high investment – cash flow sensitivities for the so called constrained firms. In as much as they report results of significantly positive relationship between investment and internal funds, the investment levels of the supposedly less financially constrained firms are rather most influenced by availability of internal finance. Kaplan & Zingales (2000) opine that perhaps "the sensitivities are at least partially caused by excessive conservatism by managers, which may arise because of the way firms are organized internally" or "because of non-optimizing behaviour by managers" as hinted by Hines & Thaler (1995). Gugler (2003) proposed the utilization of "information on the corporate governance" of firms in examining the link between investments and internal funds and this study considers and utilizes ownership structure variables as a corporate governance mechanism in the analysis of the investment cash flow relationship, given that ownership identity is prioritized in the literature on corporate governance (for example, Jensen & Meckling, 1976).

Within the corporate governance context, there have been some empirical investigations of the investment – cash flow sensitivities. Kadapakkam, Kumar, & Riddick, (1998) report higher investment – cash flow sensitivities for larger firms (consistent with Jensen, (1986) that large and mature firms may experience serious agency problems of free cash flow). Gugler (2003) posits that managerial discretion for over-investment is the reason for the positive sensitivity of investment to internal funds, shown by state controlled firms. Pawlina & Renneboog (2005) document that positive investment – cash flow sensitivities of UK listed firms "appear" to be

driven by agency costs of free cash flows. Chen et al., (2013), find that the observed investment – cash flows sensitivities exhibited by China's listed firms "seem" to be driven more by managerial discretion arguments.

Notwithstanding the enthusiasm surrounding the investigation of investment – cash flow sensitivities, empirical literature on the responsiveness of firms' investment to cash flows is not well developed in developing countries. A study of the cash flow effects on corporate investments using data from a frontier market is therefore crucial to determine whether knowledge of investment and internal funds relationship derived from studies of most developed countries applies only to those markets or actually have general applicability. While Fodio, Onah, & Oba, (2013) investigate the impact of firm size and industry classification on the investment – cash flow sensitivity among quoted Nigerian manufacturing firms, this study investigates the relationship between corporate investments and internal funds within a corporate governance context using firms listed on the Ghnan Stock Exchange (GSE) given (Abor, 2007) the growing nature of the GSE and increasing awareness of corporate governance issues. Wei & Zhang (2008), and Pindado, Requejo, & de la Torre, (2011) examine the ownership effects on the investment – cash flow sensitivity within a context of predominant family control, which is not the case in Ghana, where there are "non family" block control, (Bokpin, 2011) "shareholding is highly concentrated and corporate governance law plays a major role as well". This study seeks to examine not just how shareholding structure drives the investment – cash flow relationships (as in the case of e.g. Chen, Cao, Zhang, & Dickinson, 2013) but also to investigate how debt claims influence the sensitivity of investment to cash flows. Even though Jensen (1986) espouses the disciplining role of leverage and Jensen & Meckling (1976) define ownership structure to include debt claims, none of the existing empirical studies has had as a

primary focus the effect of debt claims on the investment – cash flow sensitivity. The study attempts to explore the idea that variables that decrease cash holding abilities or/and decrease the cost of raising external finance may also decrease corporate investments' sensitivity to internal funds.

This study makes significant contributions to literature. First, the study investigates whether the widely reported positive investment cash flow relationship can be observed using data from a frontier market, specifically Ghana. Further, whether shareholding structure moderates any such observed relationship between investment and cash flows is also investigated. Thus, this study helps to determine whether the stylized facts about investment and cash flow relationships from studies of mostly developed countries are portable across markets/countries. In addition, the study attempts to investigate whether debt claims moderate the sensitivity of investment to cash flows. This issue is of particular interest because of lack of empirical investigation despite theoretical arguments to that effect by Jensen & Meckling (1976), Myers, (1977) and Jensen (1986).

## 1.3 Research Objectives

This study purposes to examine for firms that can access financing from the stock market, how shareholding and debt characteristics moderate the investment and cash flow relationships. Specifically the study seeks:

i. To examine whether corporate investment of Ghanaian listed firms is sensitive to internal funds as observed in other studies.
ii. To determine whether the sensitivity varies according to shareholding structure.
iii. To investigate whether the sensitivity varies according to debt levels.

## 1.4 Research Questions

In line with the foregoing objectives the study focuses on answering three (3) questions:

i. Is corporate investment of Ghanaian listed firms sensitive to internal funds?

ii. Does the sensitivity vary according to shareholding structure?

iii. Does the sensitivity vary according to debt levels?

## 1.5 Significance of the Study

There are important reasons to conduct this study. First, relative to other countries, empirical studies of investment behaviour of firms in Ghana and largely Africa are rare. This study attempts to make a contribution to fill this gap. Second, the Ghanaian stock market has experienced significant growth both in volume and in market capitalization in recent years and Abor, (2007) underscores the importance of the stock market in Ghana and the pressing corporate governance issues. It is therefore interesting to ask whether the data of Ghanaian listed firms reflect the observed sensitivity of investment to internal funds. Third, given the presence of debt financing on the GSE (Abor, 2005) and evidence of the disciplining role of debt on the GSE (Bokpin, 2011), it would be interesting to examine how debt financing influences the investment – cash flow sensitivity. Finally, any observed investment – cash flow relationship and possibly what explains the sensitivity, may pave way for policy issues regarding investment behaviour of firms.

## 1.6 Scope and limitations of the Study

This study empanelled data on 27 listed firms on the Ghana Stock Exchange during the period 2007 – 2013. The study exclusively utilized available secondary data largely due to time and resource constraints, thus the 27 firms out of the possible 31. The 27 firms have complete data throughout the sample period. The time period of the study is also restricted by the availability of

the information needed for the analysis. The unavailability of ownership data of the firms throughout the sample period requires the assumption that the shareholding structure of the firms did not change substantially during the period. This is a reasonable assumption in the light of the fact that large scale ownership transfers on the Ghana Stock Exchange are rare. The ownership data have limited time variability, but the error term in the baseline regression follows a one way error component model suggesting only firm specific fixed effects. Thus, any potential error in the results will be negligible. This study seeks to explain any observed investment – cash flow sensitivities of listed firms using information on the corporate governance of the firms, but as is the case of Chen et al (2013), it is not the objective of this study to deduce whether corporate governance problems are lessened by equity markets.

## 1.7 Organization of the Study

Chapter one introduces the research, presents the research problem, objectives, questions and significance. Chapter two surveys the literature and provides an overview of existing evidence on the investment – cash flow sensitivity. Chapter three discusses the methodology employed, model specification and the estimation technique. Chapter four provides a description of the data. Chapter five presents and discusses the main results. Summary of the study and some concluding remarks are made in Chapter six.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

In this section the study presents first, a brief review of theoretical arguments that explains the role of information asymmetry and agency problems in inducing a wedge between the cost of internal and external sources of funds and why internal funds matter for corporate investment decisions. This is followed by a review of empirical studies testing the sensitivity of investment to internal funds and the various explanations offered for the observed investment – cash flow relationships.

## 2.2 Substitutability between Internal and External Finance, Information Asymmetry and Agency Problems and Investment

In their article on the cost of capital, Modigliani & Miller (1958) assume a perfect market and the absence of transaction and bankruptcy costs. Under their theorem, a firm's capital and financial structure is irrelevant to its value. This implies that internal and external funds are perfectly substitutable and the firm's real and investment decisions are independent of its financing decisions. However, markets are not perfect in practice and "the irrelevance hypothesis" falls short with the occurrence of information asymmetry problems, incentives and contract enforcement problems. These problems may generate agency costs (Schiantarelli, 1996).

The trade-off theory emerged out of the debate over the Modigliani-Miller's irrelevance theorem. Corporate income tax was added to the original irrelevance proposition (for example Fama & French, 2002) and this created a benefit for debt. The benefits of debt include the tax deductibility of interest payments and the advantage of debt tax shields favours the use of debt

(Fama & French, 2002). Given that the firm's objective function is linear, if there is no offsetting cost of debt, then there is the case for a 100% debt financing. Myers (1984) argues that this effect however, can be complicated by the existence of personal taxes and non-debt tax shields. The use of debt financing has cost implications and this includes the costs of financial distress (Modigliani and Miller, 1963) and the agency costs ignited by conflicts between shareholders and debtors (Jensen and Meckling, 1976). Cost of financial distress arises when a firm engages in excessive debt use and is unable to meet its debt obligations (involving interest and principal payments). Notwithstanding the fact that highly profitable firms are better positioned to fulfill their obligations regarding the repayment of debt and interests (Fama & French, 2002), such firms are mostly reluctant to use high amounts of debt, apparently in a bid to limit their likelihood of bankruptcy (Myers, 1984).

Akerlof (1970) asserts extensively, the role of information asymmetry problems in the market for "lemons" and points out that in the presence of asymmetric information problems, there are significant cost disadvantages of external finance. Myers & Majluf (1984) further this and provide arguments for the position of information asymmetry problems in equity financing. They point out that information asymmetry problems ensure that outside investors are not as well informed as insiders about the value of the firm's asset. Outside investors will therefore demand a premium to purchase firm's shares in an attempt to offset any losses they might incur from financing "lemons", arising from adverse selection. The works of information asymmetry problems are not absent in the loan markets and Stiglitz & Weiss (1981) explain how such problems may ignite "credit rationing in the loans market". At the heart of their proposition is that, project risk is unobservable and lenders are unable to "price discriminate between good and bad borrowers". A rise in the interest rate will only succeed in dropping relatively good

borrowers out of the market thus increasing adverse selection problems and the probability of defaults on loans made. The possibility is that lenders' expected profits will decrease. Ultimately, lenders may set in equilibrium, interest rates that leave an excess demand for loans (Schiantarelli, 1996).

Jensen & Meckling (1976) argue that the possibility of the firm issuing limited liability debt claims will produce moral hazard problems. This is premised on the fact that firms eager to expand are incentivized to opt for overly risky investment projects notwithstanding the fact that these projects may even be value decreasing. If this behaviour is anticipated by debt holders, they will demand a premium on their debt claims or bonding costs and "covenants that restrict the firm's future use of debt". Jensen & Meckling (1976) also discuss the potential conflict of interest between managers and outside shareholders. They posit that in companies where managers have less than 100% stake, there is the potential for agency costs to be generated by the discrepancy between the interests of managers and outside shareholders, since managers will bear only a proportion of the costs of "any non-pecuniary benefits" derived from actions taken to maximize their own utility. Prospective minority shareholders realizing that, managers' interests will diverge somewhat from theirs; will have the tendency to price shares to reflect the monitoring costs and the effect of the divergence between the managers' interest and theirs.

Myers (1984) proposed a pecking order theory and explains that firms most likely will finance new investments, first with internally raised funds, then with debt, and issue equity as a final resort. According to the Pecking Order Theory, the problems of information asymmetry may impose financial constraints on firms, and hence the adoption of a hierarchy in selecting sources of finance. In this pecking order, firms first use internal funds (retained profits) in their financing decisions and if it becomes necessary to turn to the option of external finance, firms will opt for

debt with little or no risk, (which usually consists of short-term debt instruments); and in the last place, firms will resort to external equity. Transaction costs associated with external source of funds, triggered by asymmetric information between the firm's insiders and outsiders, plays a vital role in the choice of financing sources (Myers, 1984).

Information asymmetries and agency problems lead to an imperfect substitutability between internal and external sources of funds and then a seeming preference for internal funds for firms' investment.

### 2.3 Empirical Investigations

Empirical studies validate investment and internal funds relationships. Starting with Fazzari et al., (1988), the investment-cash flow sensitivity has received substantial research attention. Literature (Chen et al., 2013) has reported as follows the reasons for the, observed, generally, positive investment – cash flow relationship: (1) the sensitivity may be a reflection of the relatively high cost of external capital owing from information asymmetry problems (e.g. Myers & Majluf, 1984); (2) it may be underlined by agency problems whereby managers have the tendency to "overinvest" internal funds in pursuit of their own objectives (Jensen, 1986); or alternatively (3) the sensitivity only indicates an increase in profitable investment opportunities since "cash flow is a signal of increasing profitable opportunities in the future". In the sections that follow the study presents literature on the impact of financial constraints and managerial discretions on firms' investments decisions and afterwards, the role of ownership structure, corporate governance and dividend policy issues in explaining the investment and cash flow relationship.

### 2.3.1 Asymmetric Information Problems and the Role of Financial Constraints in Firms Investment Decisions

Asymmetric information problems have ramifications for external funds availability, whether through credit rationing (Greenwald et al. 1984) or associated costs (Myers & Majluf, 1984). According to the argument by Myers & Majluf (1984), in the presence of information asymmetry problems, outside investors might undervalue risky securities, thereby imposing further costs on external finance and igniting a wedge between internal and external finance. The wedge between internal and external funds imposes a financing obstacle or constraints on firms. It stands to reason that for a large enough cost differential, corporate investment spending, rather than just varying with the availability of profitable investment projects, should also vary with the availability of internal funds, (Almeida & Campello, 2002). Thus, there is the motivation to assess and measure not just the determinants of the supposed financing obstacles, but also the degree of financial constraints faced by firms. The urge receives the necessary attention and literature is flooded with studies examining the relationships between corporate investment and internal funds in an effort (Kaplan, 1997) to test for "the presence and importance of financing constraints".

Starting with the seminal work by Fazzari, Hubbard, & Petersen (1988), these studies segregate a sample of firms according to some a priori measure or indicator of financing constraints and compare the observed investment – cash flow sensitivities of the different sub samples. If the segregating variable indicates likely a larger cost differential between internal and external funds for some firms, then a greater investment – cash flow sensitivity for such firms is considered and documented as evidences for financial constraints. In effect, financially constrained firms have high investment – cash flow sensitivity.

Of course Kaplan & Zingales (1997) critique the basis of these interpretations and insist that "the practice of (1) splitting the sample according to a measure of financing constraints and then (2) comparing investment-cash flow sensitivities across groups is justified only if investment-cash flow sensitivities increase monotonically in the degree of financing constraints". They conclude that the differential investment – cash flow sensitivity observed between firms segmented according to some a priori measure of financing obstacle should not and is not a measure of financing constraints. Indeed Cleary (1999), Kaplan & Zingales (2000) and Almeida & Campello (2001) draw similar conclusions and actually find empirical evidences of significant positive relationship between investment levels and internal cash flows, nonetheless the investment levels of less financially constrained firms are most influenced by availability of internal funds. In fact, Almeida & Campello (2002) specifically predict that investment – cash flow sensitivities "will decrease with financial constraints so long as firms are not entirely unconstrained".

Such findings only spurred further debates in literature as evidenced in Fazzari, Hubbard, & Petersen (1988, 2000) and Kaplan & Zingales (2000) and there seems to be an unsettled case in this area regarding the sufficiency or otherwise of the "conditions under which investment – cash flow sensitivities should be monotonic in financial constraints" (Almeida & Campello, 2002). Beck et al. (2006) are of the view that in the approach to determine the cross-sectional differences in firms' investment – cash flow relationships, the "sorting criteria" to distinguish a priori financially constrained firms from their unconstrained counterparts should focus on firms' characteristics that are associated with information and transaction costs at least from a theoretical point of view. Empirical studies using firm-level data, in indicating variations in firms' financing obstacles have grouped firms by dividend payouts (Fazzari et al., 1988), size and age (Devereux & Schiantarelli, 1990), business-group affiliation (Hoshi et al., 1991), , the

degree of shareholder concentration, or the pattern of insider trading (Oliner & Rudebusch, 1992), the presence of bond ratings (Whited, 1992), industrial activity and characteristics (Mizen & Vermeulen, 2005) and tangibility of firm's asset (Almeida & Campello, 2007).

Fazzari et al. (1988) group firms in their sample based on firms' dividend policy. A high dividend payout firm is considered "least financially constrained" and thus should exhibit low investment sensitivity to internal funds. The converse is also true for low dividend payout firms. A low dividend signals some level of credit constraints, and in the presence of financial frictions, the sensitivity of investment to cash flow for such firms should be larger. Moyen (2004) documents results consistent with those by Fazzari et al. (1988) when he classifies as financially constrained, firms with low cash flows and those with investment policy that exhausts internal funds. In his study, Whited (1992) includes the effect of a debt constraint in the Euler equation and split his sample according to two measures of financial distress. He presents evidence supporting the idea that the prevalence of asymmetric information problems in debt markets inhibits financially unhealthy firm's ability to obtain external funds.

Some studies (for example Mizen & Vermeulen, 2005) have taken up the theme of making use of industrial distinctiveness to assess the variation of firms' financing obstacles. In their study of UK and Germany, Mizen & Vermeulen (2005) document evidence of industrial characteristics determining investment – cash flow sensitivities in the UK although not in Germany. They present results, to demonstrate that firms with level of investments that are relatively less sensitive to internal funds availability are positioned in industries with sound financial performance and thus experience fewer problems obtaining external funds. They conclude that in as much as the nature of the industry is crucial, "in a purely structural sense", the availability of

external funds and any observed sensitivity of corporate investments to cash flow is determined by the creditworthiness "industry-by-industry".

More recently, Almeida & Campello (2007) explore the tangibility of a firm's assets as a variable enhancing a firm's ability to obtain external funds. They argue that the more tangible assets are, the more pledgeable they are and the more they mitigate contractibility problems. They document in their study, results that investment - cash flow sensitivities increase with asset tangibility for constrained firms. However, for unconstrained firms, they find no relationship between firms' asset tangibility and investment – cash flow sensitivities. They explain that asset tangibility plays a role in the variation between firms' financing obstacles and that, "firms with very tangible assets may become unconstrained".

In another vein, the balance sheet theory has been used as a channel to test cash flow effects on investment. Melander (2009) in his study of Sweden uses cash flow as a proxy for balance sheet strength and finds results in support of the theory of positive effects of internal funds on investment after "controlling for any information in cash flow about investment". More so he presents evidence that the balance sheet channel predicts a larger estimated cash flow effect on investment for particularly firms which a priori, are identified to be "likely financially constrained (low-dividend, small and non-group firms)".

There are also other studies where the determinants of financing constraints are identified at the country-level. For example, Demirguc-Kunt & Maksimovic (1998) consider country specific legal systems as the source of the variation in firms' financing hurdles and find that in countries where legal systems are more efficient, financing constraints are lower. Also, Love (2003) uses an indicator of a nation's financial market development as the a priori factor accounting for

variations in firms' financing obstacles and concludes that financial development lessens considerably the effect of financing constraints on corporate investment. Indeed, he finds a strong negative relationship between the investment - internal funds sensitivity, and an indicator of financial market development. In addition, Laeven (2003) and Gelos & Werner (2002) all report results that provide evidence that, particularly for smaller firms, financial liberalization slackens financing constraints of firms.

Arguably, all firms are financially constrained if the criterion to be so classified, is to face a wedge between internal and external cost of funds. But then, the classification scheme should be the one that properly discern the relative disparities in the degree of financing constraints (Kaplan & Zingales, 1997). Beck et al., (2006) in their empirical study report that age, size and ownership better predict financing obstacles.

### 2.3.2 Investment - Cash Flow Relationships of Group Affiliated Firms

Business groups provide the platform for an internal capital market formation that allows affiliated firms to profit from "efficient institutional mechanisms and lowering of transaction costs" (George, Kabir, & Qian, 2010). Chang & Hong (2000) show that network based groups allow informal and formal relationships for firms to generate substantial scale and scope economies by sharing different types of "intangible and technological resources". Indeed, some empirical works (Deloof, 1998; Lansing et al., 2003) show that relative to stand-alone firms, firms belonging to business groups can have better access to financial resources by exploiting internal capital market benefits. Specifically, Gopalan, & Seru (2007) report transfer of cash among group firms through intragroup loans as a way of supporting financially weaker firms. Also the phenomenon of resource transfer among network-based firms through profit redistribution was observed by George & Kabir (2008) among Indian group-affiliated firms.

These studies ultimately show that group affiliations may reduce transaction cost, provide access to financial resources and essentially mitigate any financing constraints faced by firms. With less financing constraints, such firms should exhibit lower investment – cash flow sensitivity.

In contributing to the literature on using investment – cash flow sensitivity as a measure of financing constraints, certain researchers (for example Lensink, Van der Molen & Gangopadhyay, 2003; Khanna & Palepu, 2000 ) adopt a methodology to identify and segregate firms that have any institutional affiliations which provide conduits for easing financing constraints faced by such firms. These studies find results that show the existence of significant positive investment – cash flow relationships for non-group companies, and as a result, substantially infer that, contrary to affiliated firms, independent firms face higher financing obstacles in their investment decisions.

In their well referenced work Hoshi, Kashyap, & Scharfstein (1991) conclude that group affiliations indeed alleviate underinvestment problems associated with capital market imperfections. Their conclusion was drawn from their findings that investment by Japanese firms with membership of a Keiretsu (corporate group) and with close ties with a main bank, exhibit less sensitivity to cash flow than investments by firms without such connections. In a similar observation, Kato et al. (2002) detect that for Japanese group affiliated firms, there are significantly lower investment – cash flow sensitivities.

On the other hand, Shin & Park (1999) using data on Korean Chaebol firms find no cash flow and investment relationships. Deloof (1998) also using a sample of large private Belgium firms finds that, investments of group-affiliated firms have no relationship with their internal funds. George et al, (2010) contend that “the lack of plenty robustness checks with alternative empirical

specifications" and the "unique characteristics of business groups of Japan and Korea" could be the reasons for the conflicting findings. In their own empirical analysis, George et al (2010) used the ordinary least squares estimation method (OLS) and the two-stage least squares method (2SLS) on data consisting of a balanced panel of 339 group affiliated and unaffiliated firms in India. Their results show no significant difference in the investment – cash flow sensitivity between Indian group-affiliated and stand-alone firms. They therefore conclude that, the investment cash flow sensitivities of more financially constrained firms are not in any way distinguished from those of their less financially constrained counterparts. However, there exist positive and statistically significant cash flow effects on investment for all firms.

### 2.3.3 Investment Cash Flow Sensitivity and Size

Size has been used severally (for example Kadapakkam, Kumar & Riddick, 1998; Mizen & Vermeulen, 2005) as a segmenting variable to segregate financially constrained firms from their financially unconstrained counterparts. Indeed Gertler & Gilchrist, (1994) in their search for an indicator of access to external finance rely on firm size. Apparently small firms do not just have little or no collateral, they are bereft with higher levels of firm-specific risks. Kadapakkam, Kumar & Riddick, (1998) opine that, a priori, larger firms should better access external capital markets at least for three reasons. They argue that larger firms face lower transaction costs and also since they have a relatively more public information at their disposal they should be less susceptible to the effects of information asymmetry; an idea which according to them is reinforced by Zarzeski (1996) in his findings. Thirdly, they argue that the advantages of currency of information reside more with larger firms since they can easily get current information than their counterparts, smaller firms. Even though Chirinko (1997) argues that firm size is an inappropriate criterion for segregating financially constrained firms, it can be inferred from a

considerable number of studies, particularly those aforementioned that larger firms are less constrained financially, have better access to external finance and should a priori have lower investment - cash flow sensitivity. In reality, Schaller (1993), Gertler & Gilchrist, (1994) and Gilchrist & Himmelberg (1995) all find excess sensitivity of corporate investment to cash flows for small firms than larger firms in their respective studies.

However, there are other contrary evidences on the impact of size on the investment – cash flow sensitivity. In their influential study, Fazzari, Hubbard & Petersen (1988) point out relatively low investment – cash flow sensitivity for small firms when they split samples according to size. Athey & Laumas (1994) in their study of Indian firms segment their sample according to the size of book equity capital and report higher investment-cash flow sensitivity for larger firms. Kadapakkam, Kumar & Riddick, (1998) in their study of Canada, France, Germany, Great Britain, Japan, and the USA, measure firm size in three different ways – market value of equity, total assets and sales – and report (probably except for Japan) that "the cash flow – investment sensitivity is highest in the large firm size group and smallest in the small firm size group" and this is indifferent to the measure of firm size. Devereux & Schiantarelli (1990) splitting their sample according to some measure of absolute and relative size in their study of UK find no statistical difference in investment - cash flow relationships between large and small firms. Oliner & Rudebusch (1992) also allude to the insignificant influence of firm size on the investment – cash flow relationships. While von Kalckreuth (2003) finds no differences in cash flow effects on investment when comparing large and small German firms, Chatelain et al. (2003) find a significantly greater response of investment to cash flows for smaller firms, only in the case for Italy in a cross country study of Germany, France, Italy and Spain. Further, Mizen & Vermeulen, (2005) in their study of UK and Germany report that after controlling for other

factors accounting for the investment cash flow sensitivity, neither absolute nor relative size drives the investment cash flow responsiveness.

Thus empirical evidences document somewhat mixed results on the effect of size on the investment – cash flow relationships with substantial number of such studies finding results contrary to a priori expectations. Perhaps larger firms are also financially constrained somehow. Hu & Schiantarelli (1998) actually find that larger firms have a greater likelihood to be financially constrained.

### 2.3.4 Investment Cash flow Sensitivity and the Financial System

A firm's cash flow–investment relationship is argued (Aggarwal & Zong, 2006; Mizen & Vermeulen, 2005) to be likely dependent on the national financial environment. Aggarwal & Zong, (2005) situate their conviction on the role of transaction cost and opine that in countries where the costs of accessing external funds is high, the effect of internal funds on investment levels in firms will be more revealing. Mizzen & Vermeulen (2005) ground their certainty about the impact of a nation's financial environment on the investment – cash flow relationships, on how the financial arrangement of a country controls the problem of asymmetric information. According to them, firms' investment – cash flow sensitivities are greater in market-oriented financial systems where "arms-length lenders can through corporate bond and equity markets offer funds than in relationship-oriented systems, where closer and more transparent arrangements between firms and borrowers allows firms to relate easily with and exercise greater scrutiny over fund providers. Also, Mizzen & Vermeulen (2005) point out that if the financial system is the power propelling the investment – cash flow associations, then the effects of internal funds on investment is expected to be more pronounced in countries with relatively market – based financial system than in countries with relatively bank – based financial system.

Essentially, the view in literature on any role there is that financial systems play in the observed investment – cash flow relationships are rooted in how expensive it is to access external finance. The costs of external funds are analysed at least at the margin, particularly in the aforesaid studies, to likely vary among countries with bank-centred national financial systems (relationship – oriented systems as in the case of Mizzen & Vermeulen, 2005) vis a vis countries countries with a market-centred financial systems.

Bond et al. (2003) in their study, explore across several countries with different financial systems, the impact of cash flow on investment and find results that offer some support for observed incongruity in investment – cash flow sensitivities between more market-oriented countries and some other (although they acknowledge that there might be some other contributing factors). On the other hand, Mizzen & Vermeulen (2005), in their study of UK and Germany only find results that provide evidence consistent with the idea that investment – cash flow sensitivities are greater in market oriented financial systems than relationship oriented systems when they give no particular attention to the comparability of the firms (in their sample) in terms of size and industrial activity. Once comparability of firms (in terms of size and industrial activity) is ensured across the two countries, they find no difference between the sensitivity of investment to cash flow between the UK and Germany. However, Aggarwal & Zong, (2006) find distinct evidences for differences in investment – cash flow sensitivity between countries with bank – oriented and market – oriented financial systems. They report that their findings of a significant positive relationship between investments and internal funds "seem robust to the nature of the financial system".

Beck et al. (2006) probe the role of country specific characteristics in assessing whether observed "variation in firms' financing obstacles can be explained by cross-country variation in

(i) financial intermediary development, (ii) stock market development, and (iii) legal system efficiency". They find results that give substantial support to the overall institutional development of a country as a characteristic most explaining variation in firms' financing obstacles across countries. Indeed, they report that firms account lower financing obstacles in countries where there are "higher levels of financial intermediary development, more liquid stock markets, more efficient legal systems and higher GDP per capita".

### 2.3.5 Corporate Governance, Managerial Discretion and the Free Cash Flow Hypothesis

The free cash flow theory, an antecedent to the managerial discretion idea (Jensen, 1986) has been touted as a theoretical raison d'être for the observed positive investment – cash flow relationship. In the principal – agent relationships, there is bound to be an agency problem once it becomes practically impossible to perfectly contract for every likely action an agent whose actions and choices are in the utmost concern of the principal. The case is that a manager who fails to pursue his own goals bears entirely the cost of not doing so, but captures only a fraction of any benefit therein such an action (McColgan, 2001). Jensen (1986) furthers this, arguing that whereas shareholders will opt for higher levels of cash distributions (in the absence of positive net present value projects), managers just prefer to retain earnings. Managers derive benefits from retained earnings as any size growth will present "a larger power base, greater prestige", and ability to present preeminence and reward themselves with high remuneration while dominating the board. Similarly, Conyon & Murphy, (2000) document that in larger firms, management receives a higher remuneration, and Dyck & Zingales, (2004) report findings that management of larger firms may be able to extract private benefits of control (which may be "non-pecuniary, like prestige"). Thus, managers have the urge to put a premium on pursuing growth as their corporate objective.

Shleifer & Vishny (1989) among others, argue that rather than not investing at all, managers have the tendency to opt for investments that fit best their own personal skills. The manager's desire is investments that increase firm's value and to perhaps strategically not just increase the cost of replacing him, but also provide the justification to extract higher levels of remuneration from the company. In further details of the free cash flow theory, Jensen (1986) explains that in companies where it becomes more difficult to monitor how corporate funds are utilized, managers with such funds at their disposal have their scope for privilege spending vastly increased even when there are no strong basis for investments. Kadapakkam, Kumar, & Riddick, (1998) provides additional support for the free cash flow-based explanation for the observed investment – internal funds relationships. They use sample of firms from six (6) OECD countries and report higher investment – cash flow sensitivities for larger firms. This result is consistent with those by Jensen (1986) that large and mature firms that experience more serious agency problems of free cash flow present their managers with inclinations to use available internal funds to expand the firm size.

Thus, the expectation is that the managerial discretion problem will ignite a positive investment – cash flow sensitivity even for firms without profitable investment opportunities. Indeed, Pawlina & Renneboog (2005) using a large sample of firms listed on the London Stock Exchange, document that positive investment – cash flow sensitivities of the UK listed firms "appear" to be driven by agency costs of free cash flows. Also, using financial and ownership data of firms from eight (8) East Asian countries, Wei & Zhang (2008) document results consistent with the free cash flow hypothesis, and additionally demonstrate specifically that "the investment-cash flow sensitivity is negatively related to the cash-flow rights of the largest shareholders". Gugler (2003) posits that the positive effects of cash flows on investment shown

by state controlled firms in his sample, is explainable by the managerial discretion hypothesis. Whereas Gugler (2003) and Degryse & de Jong (2006) espouse corporate governance as critical for the managerial discretion problem; the disciplining role of leverage is the focus for Jensen (1986).

Following the approach proposed by Gugler (2003) to utilize "information on the corporate governance" of firms in examining the link between investments and internal funds, Chen et al., (2013), find that the observed investment – cash flows sensitivities exhibited by China's listed firms "seem" to be motivated more by corporate governance issues. They report specifically that at low levels of shareholding concentration, (where there are significant corporate governance problems) there is a significantly positive cash flow influence on investment, but such sensitivity vanishes with improved corporate governance associated with high level of shareholding concentration. Jensen's (1986) contention on the other hand is that the existence of debt in the firm's capital structure acts as a "bonding mechanism" for company managers. He emphasizes that by issuing debt, managers contractually bind themselves to disgorge future cash flows; a discipline he believes is unachievable through dividends. Easterbrook (1984) provides evidence in support of this argument when he posits that by opting for debt financing, companies are ascribing to external capital market monitoring which forces managers to eschew personal utility maximization in favour of value maximizing strategies. Indeed Lang, Ofek & Stulz (1996) present an empirical evidence of an inverse relationship between growth and leverage for firms with low Tobin's Q. This implies that personal utility maximization programs and corporate growth objectives are not pursued by the managers of levered firms with low investment opportunities (as represented by low Tobin's Q). This lends credence to the important disciplinary function that debt performs in such companies.

Capital structure can influence investment decisions (Myers, 1977) but so does corporate governance and dividends. Paying dividends ensures that excess cash is disgorged and thus should also reduce the agency costs of free cash flow. For example, Easterbrook (1984) argues that, essentially, dividends reduce free cash flow, thus, compelling the firm to attract capital from external sources. However, unlike debts, dividends (Fauzi & Locke, 2012) do not offer the same legally binding obligation to make payments, making dividends a less dependable means of compelling managers to pay out cash-flows, an argument strongly advocated by Jensen (1986). However, such arguments have the tendency to hugely underestimate the pressures involved in maintaining dividends and the observable unwillingness by firms to cut them. Miller & Rock (1985) discuss extensively, the signaling potential of changes in dividend policy.

The free cash flow hypothesis (or otherwise the managerial discretion theory) presents the view that managers would use free cash flow to increase investment, thus the observed investment – cash flow sensitivity. All other things being equal, any factor that ensures that managers distribute free cash flow should reduce the investment – cash flow sensitivities. Debt and dividends therefore feature prominently in prompting managers to pay out cash flows and thus may reduce the investment-cash flow sensitivity.

### 2.3.6 Ownership Structure, Corporate Governance and Dividend Payout

Literature on corporate governance pays particular attention to shareholder identity (for instance, Jensen & Meckling, 1976). Jensen & Meckling (1976) defined ownership structure in terms of capital contributions and saw ownership identity to include inside equity (managers), outside equity and debt holders. Zheka (2005), as cited in Bokpin, (2011) constructs ownership structure using variables, including proportion of foreign share ownership, managerial ownership percentage, largest institutional shareholder ownership, largest individual ownership and

government share ownership. Chen et al. (2013) construct ownership structure in terms of proportion of state, "legal persons, public (private individuals and institutional investors) and insider (management and employees)" shareholdings.

Ownership structure has been documented as a factor affecting firms' dividend performance. For example, White (1996) asserts that dividend payments are linked to management's stock ownership and specifically, Short et al. (2002) documents a positive association between dividends and institutional shareholders on one hand, and a negative association with managerial ownership on the other hand, when they examined the dividend policy and institutional ownership nexus. In furtherance of this Gugler, (2003) finds evidence that the identity of the controlling owner of a firm ultimately determines target dividend levels, the smoothing of dividends and the reluctance to cut dividends. In other studies, Blouin et al. (2004) document a positive association between dividend increases and insider ownership; Nam et al. (2004) and Chetty & Saez (2005) provide cross-sectional evidences in support of the observed positive association between dividend increases and managerial share ownership. Amidu & Abor (2006) find results consistent with earlier ones and report that among firms listed on the Ghana Stock Exchange (GSE), institutional holdings relate positively with dividend-payout policies. Similarly, Bokpin, (2011) documents that on the GSE, dividend performance is affected by ownership structure and governance variables and more so the effect is specific and positive with the presence of foreign investors. However, while in India, (as cited in Bokpin, 2011), Kumar (2003) finds results that show no evidence supporting an association between foreign share ownership and dividend payout growth, Fenn & Liang (2001) report in their study that, managerial stock incentives are negatively related to dividend payouts.

### 2.3.7 Ownership Structure and Investment Cash Flow Sensitivity

Extant literature examines whether ownership structure of firms considered as a corporate governance mechanism explains the investment – cash flow relationship. Hadlock (1998) examines the nexus between insider ownership and the investment – cash flow sensitivity. He argues that if the positive investment – cash flow sensitivity is underscored by managers' preference to invest free cash flow, then the sensitivity should decrease with an increase in the alignment of managers and shareholders' interests. But if the relationship is primarily underpinned by asymmetric information hypothesis (managers underinvest due to the relative expensiveness of external finance), then the sensitivity of investment to internal funds should increase even as alignment of managers and shareholders' interest increases. Using financial and ownership data of a sample of US firms from 1973 – 1976, Hadlock (1998) used the 1975 ownership data as his measure of managers and shareholders' interest alignment. He finds a non-linear, U-shaped relationship between investment cash flow sensitivity and insider shareholdings. He interprets his results to be contrary to the free cash flow hypothesis, but consistent with underinvestment hypothesis caused by asymmetric information problems. Goergen & Renneboog (2001) complement this and find that ownership concentration affects the role of liquidity constraint in the investment and cash flow relationships. Using a panel of 240 UK listed companies during 1988–1993, they report that large institutional investors contribute effectively in reducing the investment – cash flow relationships.

Gugler (2003) in his study used a sample of non-financial Austrian firms, and reports divergent results for family and state controlled firms. He documents that, family controlled firms exhibit investment cash flow sensitivity consistent with the liquidity constraint propositions, while the positive response of investment to internal funds for firms under state control, is explained by

managerial discretion for over-investment. He posits that the evidence in support of each hypothesis is directly related to the governance structure of the firm. While family owners "seem" to be unwilling to lose control over their companies, thus, the reluctance to issue underpriced equity to finance investments, the ultimate owners of state controlled firms (the citizens) are just weak monitors.

Pawlina & Renneboog (2005) argue that blockholder monitoring should reduce agency costs and hence the investment – cash flow sensitivity, and for insider ownership, there should be an initial inverse relationship with investment cash flow sensitivity "due to better alignment of interests and lower agency costs". Using data of firms listed on the London Stock Exchange, they document that the observed investment cash flow sensitivity is mainly underpinned by agency problems. While insider ownership relates with the sensitivity in a non-monotonic way, outside block control can reduce investment sensitivity to cash flow through effective monitoring. They report as well results consistent with asymmetric information theory: the sensitivity relates inversely with ownership of financial institutions (these institutions "appear" to lessen the information asymmetric problems in capital markets).

Wei & Zhang (2008) hypothesize that the investment – cash flow sensitivity should decrease as the level of large shareholders' cash flow rights increases. Using data from eight East Asian emerging markets during 1993 - 1996, they find evidence supporting the overinvestment hypothesis caused by agency costs of free cash flow. Particularly, they find that investment – cash flow sensitivity relates inversely with the cash flow rights of the largest shareholders. Pindado, Requejo, & de la Torre, (2011) extend the work of Wei & Zhang (2008) and examine whether ownership structure of family firms, impact investment cash flow sensitivity in the Euro zone. They find that family control plays a moderating role in the investment – cash flow

relationships and this role, is non-monotonic. They report further that, the presence of second large shareholders affects the sensitivity for family firms either via "monitoring (in the case of non-family second blockholders) or collusion (in the case of family second blockholders)".

Chen et al., (2013) conjecture that "if ownership concentration and specific classes of shareholders" cannot effectively monitor managerial discretion, then a significant relationship between investment spending and cash flow is expected. Using data of Chinese listed firms during 1998 – 2004, they find no monotonic relationship between shareholder concentration and investment cash flows sensitivity. They interpret this result to be indicative of financial constraint effects rather than corporate governance issues. However, their results for different shareholder classes "seem" to be driven by corporate governance arguments.

The findings relating to the impact of ownership structure on the investment – cash flow sensitivity have been interpreted largely within the perspective of agency cost considerations and corporate governance considerations. Literature has proposed that information asymmetries of listed firms are smaller on average due to the listing and reporting requirements of stock exchanges (Oliner & Rudebusch, 1992), and Beck et. al. (2006) expect that firms that are listed on a stock exchange face lower financing obstacles. Kaplan & Zingales, (1997, 2000) critique that the sensitivity of investment to cash flow is nothing more than an indication of an increase in the set of profitable investment projects, since cash flow represents investment opportunities. Gugler's (2003) proposal to utilize corporate governance features as a way of avoiding this problem has been used by some researchers (e.g. Chen et al., 2013) and this is the approach adopted by this study as well.

**Table 2.1 Summary of Some Empirical Studies on Ownership Structure and Investment-Cash Flow Sensitivity**

| Authors (Year) | Approach | Sector/Country/Data | Estimation | Hypothesis/Results |
|---|---|---|---|---|
| Gugler (2003) | An Econometric Model of Investment, Cost adjustment process | Non financial companies Austria Panel Data (Sample A: 1991 – 1999, Sample B: 1975 - 1999) | Generalized Method Moments (GMM) | Family controlled firms exhibit investment – cash flow sensitivity consistent with the financial constraint hypothesis. Investment – cash flow sensitivity of state controlled firms is explained by managerial discretion for overinvestment. But the evidence in support of each hypothesis is directly related to the governance structure of the firm |
| Pawlina & Renneboog (2005) | q-model (Stochastic efficient frontier methodology to obtain q) | Capital Market (Listed firms, excluding banks, insurance and other financial firms) UK Panel Data (1992 – 1998) | Estimated Generalized Least Squares (EGLS) | Outside block control can reduce the sensitivity through effective monitoring. The sensitivity relates inversely with ownership by financial institutions |
| Wei & Zhang (2008) | q-model | Capital Market Eight East Asia emerging markets Panel Data (1993 – 1996) | Fixed Effects Regression | Investment cash flow sensitivity supports the overinvestment hypothesis caused by free cash flow |
| Pindado, Requejo & de la Torre (2011) | q-model | Industry Nine Euro zone nations Panel Data (1996 – 2006) | Generalized Method Moments (GMM) | Family control plays a moderating role in the investment cash flow relationships, but this role is nonmonotonic |
| Chen et al (2013) | Euler Investment Equation | Capital Market China Panel Data (1998 – 2004) | Generalized Method Moments (GMM) | No monotonic relationship between shareholder concentration and investment – cash flow relationship – interpreted as indicative of financial constraint effects. Results for different shareholder classes "seem" to be driven by corporate governance arguments. |

## 2.4 Chapter Summary

The importance of cash flows largely stems from the understanding that (Meyer & Kuh, 1957) financial variables (and thus liquidity) are relevant for corporate investment decisions. Therefore firms' investment spending is not just determined by profitable investment opportunities, but also the ability to finance these opportunities. Contrary to M&M propositions, extant imperfections in the capital markets ensure that internal and external funds are not exactly substitutable. The studies reviewed suggest that informational asymmetries and agency problems, generate significant departures from the model under the assumption of perfect capital markets and absence of transaction costs. Thus, firms' (Schiantarelli, 1996) investment decisions are quite sensitive to the availability of internal funds. This conclusion is derived for both Q models and Euler equations and is supported by empirical evidence from a number of countries. But the empirical literature on the responsiveness of the firm's investment to cash flows is not well developed in developing countries. It will be useful to provide empirical investigation using data from a frontier market so as to determine whether knowledge of investment and internal funds relationship derived from studies of mostly developed countries apply only to those markets or actually have general applicability. This research agenda is taken on by this study to examine the investment -cash flow sensitivity for listed firms in Ghana.

# CHAPTER THREE

# METHODOLOGY

## 3.1 Introduction

This chapter provides information on the approaches used to test investment cash flow sensitivities and discusses the model specifications appropriate to achieving the objectives of this current study. This current study followed the Euler equation for investment in testing the investment cash flow sensitivity. Three equations were specified to achieve study objectives. In this chapter also, the technique used in estimating the specified models would be provided. The chapter also provides some theoretical predictions within which any observed investment cash flow relationship would be explained.

## 3.2 The Model

Three approaches: the neoclassical model, the Q model and the Euler equation model are mostly used in extant literature in testing the investment – cash flow relationship. Jorgenson's (1963 and 1971) neoclassical investment model sets off with the optimization problem of the firm. Jorgenson posits that the firm's investment behaviour is premised on the determination of the optimal capital stock. The optimal capital stock will be yielded as the firm engages in profit maximization in each period. Thus the firm invests and reaches the point where the marginal productivity of its capital equals the real rental cost of capital which is determined by the cost of owning the capital (Jorgenson, 1971). Jorgenson (1971) argues that there are no adjustment costs and the capital stock will adjust instantaneously and fully to the optimal capital stock. Jorgenson's neoclassical model is based on the assumption that the capital stock is fully utilized

and that the economy attains full employment where prices of labour and capital are perfectly flexible.

The neoclassical model of investment assumes no adjustment costs and that the firm does not gain by delaying the acquisition of capital. The model further assumes that capital is homogeneous and can be bought and sold or rented at a given rate of interest in a perfectly competitive market (Jorgenson, 1971). The neoclassical investment model is hugely criticized. For example, Mueller (2003) contends that Jorgenson's investment theory is in fact a capital theory and not an investment theory since the model's assumption of immediate and full adjustment of capital to the desired capital stock essentially eliminates the investment function. Again it appears investment decisions in the neoclassical model are not forward looking particularly with the preposition of full and immediate adjustment which in itself is pretty doubtful in reality.

According to the Q model, (George et al., 2010) a firm's investment is mainly determined by expectations of future profit opportunities, usually estimated by Tobin's Q which is the ratio of the market value of assets to its replacement value. The Q is a ratio between the market value of a firm's existing capital stock and the current cost of replacing same capital stock, so that an investment project that adds more to the firm's market value than it costs to undertake will be profitable. Thus, investment is likely to be higher when the market values a firm's capital, higher than the cost of replacing that capital stock (Bond & Meghir, 1994). The Q model has been adjusted (for example, George et al, 2010) to include the availability of internal funds as an additional determinant of investment.

The use of Q is premised on the proposition that future investment opportunities, can be captured by equity market participants, who are also forward looking. The Q model is first of all criticized for its error in measurement (Carpenter & Guariglia, 2008). The average Q is the preferred choice in empirical studies in lieu of the marginal Q (the ratio of marginal revenue product of capital to its marginal cost). However, the convex adjustment cost contains much importance to a firm's investment decision and is reflected in the Marginal *Q* (Gyeke-Dako, 2007). For these two measures to be equivalent, Hayashi (1982) posits that extreme conditions of perfectly competitive product market and linear homogeneity among others would have to be met. The use of Q in the presence of information asymmetries in capital markets, introduces unparalleled evaluation of future investment opportunities between insiders and outsiders. Unlike insiders, suppliers of external funds are unable to accurately assess firms' investment opportunities, since information asymmetries ensure that there are gaps in the information sets available to the firm's insiders and outsiders. Q will, thus, only capture outsiders' evaluation of opportunities (Carpenter & Guariglia, 2003).

Indeed, the theoretical definition of marginal *Q* implies that it should embody the effects of all factors influencing investment. Thus, any significant effect of internal funds on investment might simply be because cash flow is correlated with the insiders' evaluation of opportunities, and (Kaplan & Zingales, 1997) may just reflect investment opportunities which are not captured by Tobin's Q. Also Bond & Meghir (1994) posit that the measures of Q would be subject to error if the suggestions that "stock market prices are too noisy or they display excessive volatility" relative to the primary values of companies hold.

The main alternative to the Q model, the Euler equation for investment is costs of adjustment model and (Kaplan & Zingales, 1997) is not a function of Tobin's Q and therefore is not

"affected by its mismeasurement". The Euler equation model exploits the relationship between investments in successive time periods and includes as well other determinants of a firm's investment to be total sales, cash flows, and total debt (George et al, 2010). Investment spending is potentially aimed at increasing or replacing the capital stock. In using the Euler equation to obtain an empirical model of testing investment – cash flow relationship, Bond & Meghir, (1994) argue that further investment when the capital stock is below optimal will be profitable, thus (Chen et al., 2013) a firm must over time, string its investment spending in order to attain "the optimal profile of capital stock". The Euler equation is based on the idea of value maximization over an infinite time and thus the time profile of investment is influenced by (Chen et al., 2013) expected future profits, adjustment costs, bankruptcy costs and product market structure.

### 3.3 Model Specification

This study adopts the Euler equation approach to test the investment – cash flow relationship. The study chooses to utilize this dynamic investment model and makes use of ideas from studies by Bond & Meghir (1994) and Hubbard, Kashyap & Whited (1995). The model is based on the Euler equation for optimal capital accumulation in an environment prevalent with adjustment costs. This theoretical model allows for debt finance and the holding of financial assets. While the presence of debt implies that the firm can go bankrupt, the interest rate charged and the probability of bankruptcy will, however, depend on the amount borrowed and Bond & Meghir (1994) assume that in the event of bankruptcy, ownership of the firm is transferred entirely to debt holders.

The approach assumes that the firm has the objective to maximize a levered equity. Bond & Meghir (1994) generalizes the value of levered equity for a firm that generates net cash flows as follows:

$$V_t = E_t\left[\sum_{j=0}^{\infty}\beta_{t+j}^{t}\left(\gamma_{t+j}\prod_{t+j}+\left(\gamma_{t+j}\left(1-f_{t+j}\right)-1\right)N_{t+j}\right)\right]-\gamma_t\left(1+(1-\tau_t)i_{t-1}\right)D_{t-1}$$

$$-E_t\left[\sum_{j=1}^{\infty}\beta_{t+j}^{t}q_{t+j}^{t+j-1}\gamma_{t+j}X_{t+j}\right]$$

$$+E_t\left[\sum_{j=1}^{\infty}\beta_{t+j}^{t}\left(1-q_{t+j}^{t+j-1}\right)\gamma_{t+j}\left(\tau_{t+j}-m_{t+j}^{D}\right)i_{t+j-1}D_{t+j-1}\right]$$

$$+E_t\left[\sum_{j=1}^{\infty}\left(\beta_{t+j-1}^{t}\gamma_{t+j-1}-\beta_{t+j}^{t}\gamma_{t+j}\left(1+\left(1-m_{t+j}^{D}\right)i_{t+j-1}\right)\right)D_{t+j-1}\right]$$

Here, $\gamma_{t+j}$ reflects tax discrimination between dividend income and capital gains; $\prod_{t+j}$ denotes the net revenue generated within the *j*-period; $f_{t+j}$ denotes the transaction charge on per unit of new share issues (which is assumed to be zero for simplicity); $N_{t+j}$ is the value of new shares issued within the *j*-period; $\tau_t$ is the rate of corporate income tax against which interest payments are assumed to be deductible; $i_{t-1}$ is the interest rate payable on debts issued in the previous period; $q_{t+j}^{t+j-1}$ denotes the probability perceived in period one that the firm will go bankrupt in period two; $X_{t+j}$ denotes the value of the deadweight cost involved in the bankruptcy process; $m_{t+j}^{D}$ is the tax rate paid on interest income by the marginal lender. Expectations which are taken over future interest rates, input and output prices and technologies are assumed to be rational and the expectations operator $E_t[\ ]$ is conditional on information available at the start of period *t*. The *j*-period discount factor is given by $\beta_{t+j}^{t}$.

The first term in the expression gives the value of the firm if it issues no debt from period *t* onwards. The second term is the cost of repaying debt inherited from the previous period. Bond & Meghir (1994) explain that if a firm enters period *t* with some debt outstanding from the previous period, repayment of this debt reduces the dividend that it can pay in period *t* and if the firm does not default in period *t*, then the value of its levered equity is reduced by the second term in the expression. They argue that this value is predetermined and irrelevant to the maximization of the firm's value, $V_t$. The third term in the firm's value function gives the present value of expected bankruptcy costs. Finally, the last two terms provide the present value of the net tax advantages that result from issuing debt. These tax gains are traded off against expected bankruptcy costs as the firm pursues an optimal borrowing policy (Bond & Meghir, 1994).

The firm maximizes this value function subject to the following constraints:

1. $K_t = (1 - \delta)K_{t-1} + I_t$ (where $\delta$ is the depreciation rate)
2. $d_t \geq 0$
3. $N_t \geq 0$
4. $\lim_{T\to\infty}\left[\sum_{j=t}^{T-1} \beta_{ij}\right] D_{iT} = 0, \forall t$

The first constraint is the capital stock identity; the second constraint restricts dividends to non negative values; the third limits shares repurchase and the fourth constraint restricts the firm from borrowing infinite amount.

By using the envelope theorem and solving the first order condition for investment, Bond & Meghir (1994) arrive at the Euler equation characterizing the optimal path of investment.

$$(1-\delta)\beta_{t+1}^{t}E_t\left[(\gamma_{t+1}+\lambda_{t+1}^{d})\left(\frac{\partial\prod}{\partial I}\right)_{t+1}\right]$$

$$= -(\gamma_t+\lambda_t^{d})\left(\frac{\partial\prod}{\partial I}\right)_t-(\gamma_t+\lambda_t^{d})\left(\frac{\partial\prod}{\partial K}\right)_t-v_t\left(\frac{D_t^2}{p_t^I K_t^2}\right)$$

Here, $\lambda_t^d$ denotes a Kuhn-Tucker multiplier. In arriving at this Euler equation describing the firm's optimal investment path, Bond & Meghir (1994) assume that both the bankruptcy probability and the interest rate depends on the amount borrowed $D_t$ and the size of the firm $K_t$only through the ratio $\left(\frac{D_t}{p_t^I K_t}\right)$, where $p_t^I$ is the price of capital goods. They assume further that bankruptcy costs depend on $D_t$ but not $K_t$ and that they are homogeneous of degree one in $D_t$. This Euler equation even though written in terms of observables, "can be estimated by evaluating expectations at realized values" as it controls for expectations (Bond & Meghir, 1994). This Euler equation also shows that liquidity constrained firms will reserve investment in time *t* for investment in time *t+1*.

In obtaining the derivative of net revenue with respect to *I* and *K*, Bond & Meghir (1994) specify the firm's net revenue function as follows:

$$\prod_t = p_t F(K_t, L_t) - p_t G(I_t, K_t) - w_t L_t - p_t^I I_t$$

where $G(I_t, K_t) = \frac{1}{2}bK_t[(I/K)_t - c]^2$ is a symmetric adjustment cost function, $F(K_t, L_t)$ is a constant returns to scale production function, $p_t$ is the price of the firm's output, $w_t$ is the vector of prices for the variable inputs $L_t$ and $p_t^I$ is the price of investment goods. They allow for imperfect competition by letting $p_t$ depend on output.

They assume that the adjustment cost function is linearly homogeneous in investment and capital. Based on this assumption they show that the derivatives of net revenue with respect to *I* and *K* can be written as:

$$\left(\frac{\partial \prod}{\partial I}\right)_t = -bap_t\left(\frac{I}{K}\right)_t + bcap_t - p_t^I$$

and

$$\left(\frac{\partial \prod}{\partial K}\right)_t = ap_t\left(\frac{Y}{K}\right)_t - ap_t\left(\frac{\partial F}{\partial L}\frac{L}{K}\right)_t + bap_t\left(\frac{I}{K}\right)_t^2 - bcap_t\left(\frac{I}{K}\right)_t$$

where $Y_t = F_t - G_t$ denotes net output and is assumed to be linearly homogeneous in capital and investment. The marginal products of variable factors $\left(\frac{\partial F}{\partial L}\right)$ is assumed to be replaceable from the first order condition by $(w/ap)$.

Specifying the ratio of cash flow to the capital stock as $(C/K)_t = (p_tY_t - w_tL_t)/(p_tK_t)$ and reflecting borrowing by $(D/K)_t^2 = (p_t^I/p_{t+1})[D_t/(p_t^IK_t)]^2$, Bond & Meghir (1994) obtain an empirical model of investment and the level of investment can be expressed in the following form:

$$\left(\frac{I}{K}\right)_{it} = \beta_1\left(\frac{I}{K}\right)_{i,t-1} + \beta_2\left(\frac{I}{K}\right)_{i,t-1}^2 + \beta_3\left(\frac{Y}{K}\right)_{i,t-1} + \beta_4\left(\frac{D}{K}\right)_{i,t-1}^2 + \beta_5\left(\frac{CF}{K}\right)_{i,t-1} + \varepsilon_{it} \qquad (1)$$

where *I/K*, *Y/K*, *D/K*, and *CF/K* stand for investment, income, debt and cash flow relative to the capital stock, respectively. The subscripts *i* and *t* represent the firm and time respectively while $\varepsilon_{it}$ represents the error term. The coefficient on the lagged investment rate is expected to be positive. The inclusion of the squared term of the lagged investment rate, relaxes the assumption

of no adjustment costs and therefore account for the cost of adjustment when changing the capital stock. Cost of adjustment could connote planning, training and installation costs and perhaps the disruptions to the normal production process due to incorporation of new capital equipment. The model expects the coefficient on the squared lagged investment to be negative and less than one in absolute value. The lagged income term (Y/K) controls for imperfect competition and its coefficient is expected to be positive. Under the assumptions of imperfect competition, firms will increase investment as the optimal level of the income/capital ratio increases. The squared lagged debt term (D/K) controls for the possibility of bankruptcy resulting from an increase in debt levels. High levels of leverage lead to higher probability of bankruptcy as well as increasing the costs associated with a bankruptcy event (Chen et al, 2013). Thus the coefficient of the debt term is expected to be negative. The theoretical model expects that the coefficient on the cash flow variable should be negative under the assumption that the firm can raise as much finance as it desires (Bond & Meghir, 1994). The dependent and independent variables have all been scaled by their respective period's capital. This, according to Chen (2008) can control for possible heteroscedasticity due to differences in firm size.

In the equation, the coefficient $\beta_5$ reflects the investment – cash flow sensitivity. If higher internal funds are a significant determinant of high levels of investments, then the coefficient of the cash flow variable would be positive. As stated earlier on, this will imply corporate governance failures or/and cash constrained issues. The inverse also holds in the case for a negative coefficient of the cash flow variable.

The study assumes that the error term, $\varepsilon_{it}$ follows a one-way error component model (consistent with Bokpin, 2011) suggesting:

$$\varepsilon_{it} = \mu_i + \omega_{it}$$

where $\mu_i$ is time-invariant specific firm characteristics and accounts for any unobservable individual-specific effect that is not included in the regression model. The term $\omega_{it}$ represents the remaining disturbance, and varies with the individual firms and time. Judson & Owen, (1996) argue that fixed effects models are generally more appropriate than random effects models in instances where the individual effects represents omitted variables that are highly likely to be correlated with the other regressors and in situations where the panel data is less likely to be a random sample from a much larger universe. These arguments identify substantially with the model adopted and the sample used. These parameters are anyway not of specific interest to this study (an argument consistent with Chen et al, 2013).

Some studies (for example, Chen et al, 2013) adopt the approach where the sample is split according to shareholding characteristics and then examine if the cash flow effects are different across the sub samples. An equivalent and perhaps a more direct approach may be to estimate the model for the entire period and employ the interaction of the cash flow with a dummy variable representing shareholding characteristic. This direct approach is used throughout this study. Also, by this direct approach, the sample size is preserved, which otherwise would not be the case if the sample were split into sub-samples according to shareholding characteristics.

Thus the regression specification used to analyze the specific effect of shareholding structure is as follows:

$$\left(\frac{I}{K}\right)_{it} = \beta_1\left(\frac{I}{K}\right)_{i,t-1} + \beta_2\left(\frac{I}{K}\right)^2_{i,t-1} + \beta_3\left(\frac{Y}{K}\right)_{i,t-1} + \beta_4\left(\frac{D}{K}\right)^2_{i,t-1} + \beta_5\left(\frac{CF}{K}\right)_{i,t-1} + \beta_6\left(\frac{CF}{K}\right)_{i,t-1} * INST + \beta_7\left(\frac{CF}{K}\right)_{i,t-1} * IND. + \beta_8\left(\frac{CF}{K}\right)_{i,t-1} * FOREIGN + \varepsilon_{it} \qquad (2)$$

The regression coefficients $\beta_6$, $\beta_7$, and $\beta_8$, capture respectively the influence of institutional, individual and foreign shareholdings on the sensitivity of investment to cash flows. Institutional control (shareholdings by pension funds and domestic banks) is represented by a dummy equals to 1 and 0 otherwise. Likewise foreign control (shareholdings of foreign firms), and individual control (shareholdings of private individuals and other institutional investors) are all represented by dummy variables equal to 1 and 0 otherwise respectively.

Finally, the regression specification used to examine the effect of debt claims is as follows:

$$\left(\frac{I}{K}\right)_{it} = \beta_1\left(\frac{I}{K}\right)_{i,t-1} + \beta_2\left(\frac{I}{K}\right)^2_{i,t-1} + \beta_3\left(\frac{Y}{K}\right)_{i,t-1} + \beta_4\left(\frac{D}{K}\right)^2_{i,t-1} + \beta_5\left(\frac{CF}{K}\right)_{i,t-1} + \beta_6\left(\frac{CF}{K}\right)_{i,t-1} * DEBT + \varepsilon_{it} \qquad (3)$$

Debt is a dummy variable set equal to 1 if a firm's average total debt ratio is equal to or larger than the median total debt ratio of firms over the sample period. Otherwise, it is equal to zero. The median criterion follows a similar approach used in literature (for example Degryse & de Jong, 2006 and Chen et al, 2013). The regression coefficient $\beta_6$ in equation (3) captures the

influence of debt claims on the responsiveness of firms' investment to cash flows. The study expects to see the effects of cash flows on investment to vary according to the different shareholding characteristics and debt levels. The variations expected would be explained within the conjectures made later in section 3.5 of this chapter.

### 3.4 Estimation Technique

This study adopts a dynamic panel data model. In a dynamic investment model such as the Euler equation, investment depends on its own past realization. Several econometric problems may arise from estimating equation (1):

i. The presence of the lagged dependent variable gives rise to endogeneity problems. The past realization of investment is likely to be correlated with the fixed effects present in the error term. This violates exogeneity assumptions necessary for consistency of Ordinary Least Squares (OLS) estimators

ii. Time-invariant firm characteristics (fixed effects), may be correlated with the explanatory variables

iii. The panel dataset has a short time dimension ($T = 7$) and a larger firm dimension ($N = 27$).

The endogeneity problem can usually be dealt with by using instrumental variables estimation (two-stage least squares or 2SLS). But the 2SLS estimators are only efficient if the errors are homoskedastic. Again, even though the 2SLS may avoid endogeneity among regressors, it fails to absorb unobserved heterogeneity (Stock & Watson, 2003). Thus, this study preferred to follow the First Difference GMM technique in order to report results expected to be free from estimation biases. The Arellano – Bond (1991) difference GMM estimator first proposed by Holtz-Eakin, Newey & Rosen (1988) does not just use only the exogenous instruments but also lagged levels of the endogenous regressors. This makes the endogenous variables pre-determined

and, therefore, not correlated with the error term in the equations. The difference GMM uses first differences to transform the equation by transforming the regressors through first differencing. Thus, the fixed firm-specific effect is removed, because it does not vary with time. The first-differenced lagged dependent variable is also instrumented with its past levels. Finally, the Arellano – Bond estimator was designed for small-T large-N panels. In large-T panels a shock to the firm's fixed effect, which shows in the error term, will decline with time. Similarly, the correlation of the lagged dependent variable with the error term will be insignificant (Roodman, 2006). In these cases, one does not necessarily have to use the Arellano – Bond estimator.

The First Difference Generalised Method of Moments (GMM) Approach, proposed by Arellano-Bond (1991) is defined for panel analysis and can avoid dynamic panel bias. According to Roodman (2006), the method is appropriate for balanced panel and in the following cases: When, (1) there are few time periods, but many observations; (2) the dependent variable depends on its own past realizations; (3) there are fixed individual effects; (4) there are independent variables that are not strictly exogenous; (5) the functional relationship is linear and (6) there are serial correlation and heteroskedasticity within individual entity's errors, but not across them.

The study considered the first difference GMM appropriate, particularly when the sample was a balanced panel and the orthogonal deviations would not have been necessary. Roodman (2006) argues that since the orthogonal deviations technique maximizes the sample size it is more appropriate for panels with gaps. Mileva (2007) cautions that, even though using the system GMM increases efficiency, it may not be appropriate to use system GMM with a dataset with a small number of entities, since system GMM uses more instruments than the difference GMM. The Sargan test may be weak when the number of instruments exceeds the number of entities (Mileva, 2007). Again Roodman (2006) documents that, "too many instruments can over-fit

endogenous variables and fail to expunge endogenous components". Roodman (2006) argues further that, using system GMM requires additional assumptions that changes in the instrumenting variables are uncorrelated with fixed effects; an assumption he believes is a prerequisite to the validity of the additional instruments in system GMM. Roodman (2006) discusses that this assumption depends on assumptions about the initial conditions, that "in the first period, deviations in the instrumenting variable (and) its convergent value is not correlated with the fixed effects". The study would report results for the two step estimation. Mileva (2007) contends that in two step estimation, the standard covariance matrix is robust to panel-specific autocorrelation and heteroskedasticity.

Several specification tests are applicable and thus would be carried out. The validity of the instruments used can be tested by reporting the Sargan test statistic. The Sargan test statistic is a standard diagnostic used in GMM estimation to evaluate the suitability of the model. It is asymptotically distributed as a chi square with its degrees of freedom as the number of instruments less the number of parameters. The test would be performed under a null hypothesis of correct model specification and valid overidentifying restrictions. A rejection of the null hypothesis implies that the required orthogonality conditions are not satisfied by the instruments, either because they are being incorrectly excluded from the regression or are not truly exogenous. Tests of serial correlation in the error terms would be performed by employing autocorrelation tests. The serial correlation tests are to determine whether the lagged instrument variables are valid for the specification. The null hypotheses in serial correlation tests are that, the level regression shows no first order serial correlation, while the first differenced regression shows no second order serial correlation.

## 3.5 Theoretical Predictions

*Managerial Discretion Hypothesis*

*Shareholding Structure*

Gugler (2003) asserts that corporate governance may fail and the failures depend on the identity of the controlling shareholder. The presence of large state shareholding should represent ineffective corporate governance. The ultimate owners of state controlled firms can be viewed as citizens who have little incentives, skills and ability to monitor the state and ultimately managers. The "de facto control rights" are exercised freely by managers, bureaucrats and politicians whose interests, including more often than not overspending, short-run employment gains and other votes buying mechanisms are different from value maximization (Gugler, 2003).

Similarly, in instances where there are diffused shareholdings, shareholders may not have the time, skill or the incentive to monitor managerial activities. In instances with individual and institutions with small portions of total shares, there may be free rider problems where nobody considers it in their best interest to monitor management while others do nothing but derives benefits. However, Shleifer & Vishny (1986) report that individual investors with large controlling interests usually create a strong controlling mechanism thus enhancing their abilities to monitor managers. Large block holders may possess more skill, more time and a greater financial incentive to closely monitor management. Also, such shareholders may be able to elect themselves onto company boards thus increasing their ability to monitor managers.

But passive investment strategies are typically less costly for fund managers and other institutional investors. These managers are also aware that participating in a company's governance may position them as a company insider who is privy to price sensitive information,

and such, "they would be unable to trade immediately on the basis of any governance enhancements they had participated in" (McColgan, 2001). Further, McColgan, (2001) documents that financial institutions may participate only passively in individual firm's corporate governance since their stake may represent only a tiny fraction of their overall portfolio.

The presence of foreign investors should improve corporate governance and dividend payouts (Bokpin, 2011) and high dividend payout reduces the free cash flows available to managers. This is potentially the case for shareholding by pension funds as well. Thus, large state shareholding should cause increased sensitivity of investment to cash flow due to corporate governance problems while foreign ownership should reduce the sensitivity due to improved corporate governance and dividend performance. The role of bank, pension fund and large individual shareholders is not particularly clear, a priori.

*Debt Financing*

Capital structure can influence investment decisions, even without apparent market imperfections (Myers, 1977). Meanwhile, Jensen & Meckling (1976) argue that while the existence of debt reduces the amount of equity, it may enable higher levels of insider ownership. Jensen (1986) also argues that the existence of debt in the firm's capital structure acts as a bonding mechanism for company managers, so that managers necessarily disgorge cash flows to meet debts covenants and obligations. Thus, high levels of leverage should reduce investment – cash flow sensitivity.

*Cash Constraints Hypothesis*

*Shareholding Structure*

For large state shareholding cash constraints are not expected. Since there is virtually no incentive for alignment between controlling managers and ultimate owners, there is no reason for managers of state-controlled firms to favour existing over new shareholders and not issue equity. Neither does credit rationing also seem likely since the risk of bankruptcy is low and there is no adverse selection of loan applicants (Gugler, 2003). Besides Chen et al., (2013) argue that state or quasi-state institutions can ensure good banking relationships by using political connection. Similar arguments hold for banks and pension funds. Therefore large state and institutional shareholding should reduce investment – cash flow sensitivity. Chen et al (2013) argue that public shareholding should not provide any access to bank finance, and that public and foreign ownership should not impact the sensitivity of investment to cash flow in the case of financial constraints. However, Harrison & McMillan (2001) document that foreign ownership should ease firms' credit constraints since foreign firms may be more established with better financial ratios and thus, be a safer bet for lending institutions. This study is unable to form specific a priori expectation about the effects of foreign and individual control on investment – cash flow sensitivity, particularly when there is the possibility of ultimate owners being different from the direct owners and this study lacks the data to make such determination (an argument consistent with Gugler, 2003).

*Debt Financing*

Leverage has its associated related costs and bankruptcy costs and Stulz (1990) argues that there will always be a danger that debt could lead to under-investment due to the costs of raising new

finance, notwithstanding the argument that it may reduce the risk of over-investment. Thus, high levels of leverage should increase the sensitivity of investment to cash flows.

**Table 3.1 Predictions / Apriori Expectations about the Ownership Effects**

| Ownership Characteristic | Cash Constraint Hypothesis | Managerial Discretion Hypothesis |
|---|---|---|
| Shareholding Classes: | | |
| Individual | ? | ? |
| Institutional | - | + |
| Foreign | ? | - |
| Debt Financing | + | - |

Note: A ' + ' means that the prediction is a positive cash flow coefficient, a '-' means that the prediction is a negative cash flow coefficient and a '?' means an indeterminate prediction.

## 3.6 Chapter Summary

The study followed the Euler equation for investment in testing the investment cash flow sensitivity of Ghanaian listed firms. Three equations were specified: equation (1) to test the sensitivity of firms' investment to cash flows, equation (2) to test for the influence of shareholding on the sensitivity of investment to internal finance and equation (3) to examine the influence of debt holdings on the investment cash flow relationships. Chapter three provides the technique employed in estimating the models specified to achieve the objectives of the study. Just like the previous studies, this current study adopts the first difference GMM developed by Arrelano & Bond (1991) to estimate all the specified models. Any observed differences in the influences of shareholding classes and debt holdings would be explained according to the predictions of liquidity constraints and managerial discretion hypotheses

# CHAPTER FOUR

# DATA DESCRIPTION

## 4.1 Introduction

This chapter provides some information on the study settings and discusses some occurrences and dynamics on and of the Ghana Stock Exchange with particular attention to the needs of this study. The chapter presents as well information on the data and sources and also a definition of the variables employed. Further, the study provides in this chapter, some description and summary statistics of the data.

## 4.2 The Ghanaian Institutional Setting

The Ghana Stock Exchange (GSE), just as most institutions of its sort plays a crucial role in the country's capital market by serving as the anchor institution in opening up access to external capital. The GSE has been "informationally transparent" among other efforts aimed at promoting investments and listings on the exchange. By December, 2013 the number of listed firms stood at 34. Market capitalization has also increased from GH¢17.9 billion in 2008 to GH¢61.2 billion in 2013. Currently, the listed companies operate within the finance, distribution, food and beverage, insurance, manufacturing, mining, and agriculture sectors. The growing nature of the GSE has also brought along with it, increasing awareness of corporate governance issues (Abor, 2007). The need to address corporate governance issues is perhaps what prompted the Ghana Securities and Exchange Commission to develop a Corporate Governance Code of Best Practice against which companies can benchmark their practices in addition to the development of the National Accounting Standards. The Ghanaian regulatory framework with regard to corporate governance comprises the Ghana Companies Code (1963), the Securities Industry Law, 1993 (PNDCL 333)

as amended, and the Membership and Listing Regulations of the Ghana Stock Exchange (GSE, 1990) and supported by the Ghana National Accounting Standards and the codes of professional conduct imposed by the Institute of Chartered Accountants (Ghana) on its members (Bokpin, 2011).

Shareholding structure in the Ghanaian stock market is characterized by block control. This, according to Bokpin, (2011) stems from the fact that the majority of the companies on the GSE were listed through the privatization process, with the Government of Ghana in line with the GSE listing rule, which requires that more than 25 percent of a company's shareholding be in public hands; selling a proportion or all of its interests in companies (where it owned shares) to other investors. The sale of the government's interests was done mainly in blocks rather than on a dispersed basis. Thus privatization actually played a key role in the existence of block control, in the Ghanaian stock market (Bokpin, 2011). Also Bokpin & Isshaq, (2009) identify that the participation of foreign investors has actively been encouraged on the GSE over the couple of years. They find foreign share ownership on the GSE on the average to be 31.92 percent with the maximum foreign share ownership on the exchange to be 90.24 percent. Some firms on the GSE, however, do not have foreign share ownership, but quite a number of them are controlled by foreign investors. They document further that corporate governance and level of disclosure and transparency practices on the GSE are influenced by foreign participation. In addition, Bokpin, (2008, 2011) identifies that insider system of corporate governance is practiced on the GSE while share scheme for managers and employees are little, and perhaps viewed in Ghana as a mechanism for aligning the interests of managers and owners. Apparently, insider ownership in the Ghanaian stock market is negligible. So in Ghana, besides the tremendous shareholding concentration, a peculiarity of the corporate governance system is that corporate governance

practices is backed by laws which seem to combine features of the two main governance models of Anglo-Saxon countries and non-Anglo-Saxon countries (Bokpin, 2011).

There is evidence that ownership structure does influence dividend payouts on the GSE. In a study utilizing data from 23 firms listed on the Exchange, Bokpin, (2011) documents that dividend performance on the GSE is affected by ownership structure and governance variables and particularly the presence of foreign investors positively influences dividend payment among companies on the exchange. He further reports results consistent with the disciplining role of debt: "firms with higher debt levels in their capital structure will cut down on dividend payment significantly to meet debt covenants and obligations such as interest payment". Meanwhile Abor, (2005) reports the presence of debt financing on the GSE with 85 percent of the debt specifically represented in short-term debt. These sceneries should therefore provide the necessary perspectives in defining shareholding and debt characteristics, to test the investment cash flow relationship and to explain the driving force behind any observed sensitivity of investment to internal funds of listed firms in Ghana.

### 4.3 Variable Definitions

From the sample data, the following variables were constructed.

Capital stock ($K$) is defined as the book value of fixed assets as shown in the balance sheet.

Investment ($I$) is defined to be consistent with Chen et. al. (2013) and equals the cash outflow for the purchase of new fixed assets and other non-current assets as shown in cash flow statements;

Total Income ($Y$) measures a firm income and is equal to the total sales/revenue obtained from the firm's income statement

Cash flow (*CF*) is defined as the sum of operating profit before interest and taxes, depreciation of fixed assets and amortization (consistent with George et al, 2010) and is obtained from a firm's cash flow statement;

Debt (*D*) is defined consistent with George et al (2010) and equals the book value of total debt and is obtained from the firm's balance sheet.

*Debt holdings variables*

The other variable used for the analysis include leverage ratio and is equal to the ratio of total debt to total capital. The total debt is irrespective of the term and total capital is the sum of total debt and total equity and are all obtained from the firm's balance sheet.

*Shareholding variables*

Three different ownership variables were analyzed:

FOREIGN: shareholding by foreign firms. Nationality is defined consistent with Gugler (2003) and is identified by the location of the headquarters.

INST.: shareholding by banks and pension funds

IND.: shareholdings of private individuals and other institutional investors.

The ownership variables are constructed from direct ownership as reported in annual reports since the study lacks data to determine ultimate ownership. The study focuses on the controlling interest in a firm. Even though a firm can have more than one controlling interest, the study focuses on the largest controlling interest. The top one and two shareholders of the firms sampled control more than 40% to 90% of the stocks.

## 4.4 Data Source

The study uses the financial and ownership data of firms listed on the Ghana Stock Exchange (from www.annualreportsghana.com). The sample period covers the period 2007 – 2013. The study selects firms for which complete data are available for all years. The sample consists of a balanced panel of 27 firms. Following the previous literature (for example, George et al, 2010) and taking into account the availability of data related to companies' ownership structure three different ownership variables are analyzed: foreign, institutional and individual ownership. The ownership data are available for one year and are assumed to remain the same for the sample period. Given that large-scale ownership transfers are rare on the GSE, any potential error in the results will therefore be negligible. Similar arguments are made by George et al (2010).

## 4.5 Data Description

Table 4.1 presents some descriptive statistics for the sample of 27 firms over the period of 2007 – 2013. New investments for the period averages around 18 – 36% of the period's capital stock. Bond & Meghir (1994) report an average investment around 9.5% for 626 UK listed firms for the period 1971 – 1986 while Chen et al (2013) report an average investment around 15 – 28% for 786 Chinese listed firms over the period 1988 – 2004. These high rates of new investments by Ghanaian listed firms considerably explain the high capital stock growth rates observed over the period. But for the decrease experienced by all the variables in 2009, the investment related variables generally exhibit upward movements over the period. Thus, investments, sales, debts and cash flows relative to fixed assets generally trended upward over 2007 – 2013.

**Table 4.1: Descriptive Statistics of Investment Related Variables**

| | I/K | Y/K | D/K | CF/K |
|---|---|---|---|---|
| Mean | 0.26 | 5.21 | 12.27 | 1.07 |
| Median | 0.22 | 3.13 | 2.69 | 0.57 |
| Std. Dev. | 0.21 | 5.78 | 18.61 | 2.65 |
| Maximum | 1.59 | 36.99 | 95.05 | 24.81 |
| Minimum | 0.01 | 0.12 | 0.07 | -15.47 |
| Mean 2007 | 0.28 | 5.37 | 11.15 | 0.93 |
| Mean 2008 | 0.26 | 4.72 | 12.04 | 1.73 |
| Mean 2009 | 0.22 | 4.72 | 10.96 | 0.23 |
| Mean 2010 | 0.18 | 4.99 | 10.98 | 0.96 |
| Mean 2011 | 0.26 | 5.93 | 13.01 | 1.14 |
| Mean 2012 | 0.26 | 5.29 | 13.35 | 1.15 |
| Mean 2013 | 0.36 | 5.46 | 14.39 | 1.35 |

Note: I/K, Y/K, D/K and CF/K represents investment, sales, debts and cash flow relative to fixed assets respectively.

The study presents also plots of how mean investment rates relate with sales, debts and cash flows relative to fixed assets over the period.

**Fig. 4.1: Investment and Sales**

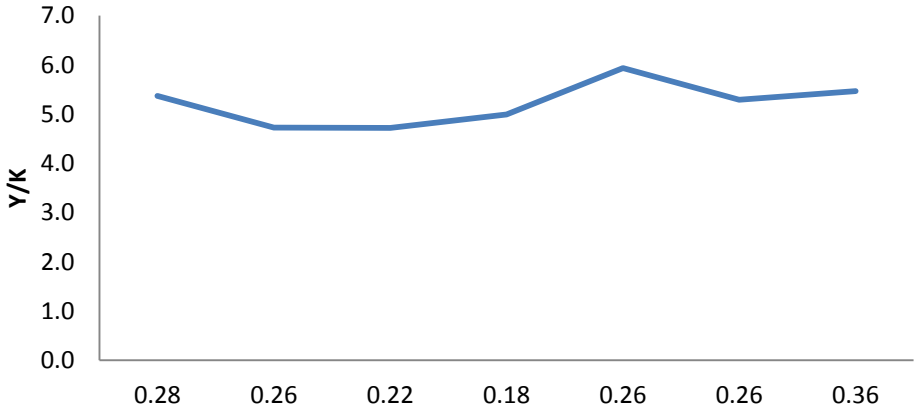


**Fig. 4.2: Investment and Debt**

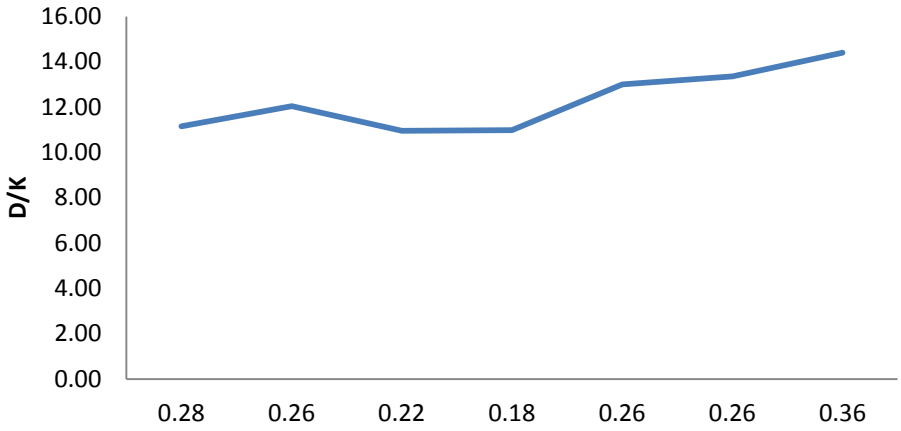
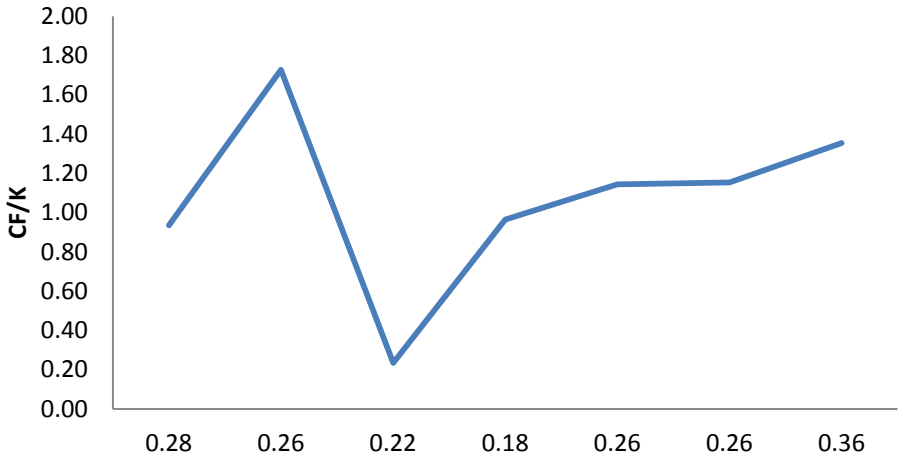



**Fig. 4.3: Investment and Cash Flows**




Higher investment was generally associated with increases in debts and sales. Between 2007 and 2008 and also between 2009 and 2010, higher cash flows were associated with declining investments, otherwise investment increases with cash flows. This could be interpreted as firms financing higher levels of investment by borrowing while also firms' investments resulting into increase sales and higher cash flows.

Table 4.2 below presents the pairwise correlation matrix for the variables used in this study. The correlation matrix examines the relationships between the variables under consideration.

**Table 4.2: Correlation Matrix**

| | $(I/K)_{it}$ | $(I/K)_{i,(t-1)}$ | $(I/K)^2_{i,(t-1)}$ | $(Y/K)_{i,(t-1)}$ | $(D/K)^2_{i,(t-1)}$ | $(CF/K)_{i,(t-1)}$ |
|---|---|---|---|---|---|---|
| $(I/K)_{it}$ | 1.0000 | | | | | |
| $(I/K)_{i,(t-1)}$ | 0.4634*** | 1.0000 | | | | |
| $(I/K)^2_{i,(t-1)}$ | 0.2455*** | 0.8614*** | 1.0000 | | | |
| $(Y/K)_{i,(t-1)}$ | 0.2627*** | 0.3413*** | 0.2151*** | 1.0000 | | |
| $(D/K)^2_{i,(t-1)}$ | 0.0895 | 0.0835 | 0.0099 | 0.1282 | 1.0000 | |
| $(CF/K)_{i,(t-1)}$ | 0.1321* | 0.1733** | 0.1113 | 0.1138 | 0.4949*** | 1.0000 |

The asterisks ***, ** and * represents statistical significance at 1%, 5% and 10% respectively. Largely, the explanatory variables have significant correlations with the dependent variable and also with the exception of the correlation between the lagged dependent variable and the squared lagged term (which was expected), there is no evidence of too high correlations between variables.

## 4.6 Chapter Summary

The chapter considered some empirical observations in relation to the Ghana Stock Exchange and revealed that the growing nature of the exchange brings along with it corporate governance issues. The chapter also revealed that shareholding structure on the exchange is largely characterized by block control and there is also the huge presence of foreign shareholdings and debt holdings. The data for this study is a balanced panel of 27 firms over the period 2007 – 2013. The study uses financial and ownership data of the listed firms. The investment related variables used are capital stock, cash flows, income, investment and debts. Ownership variables employed were shareholding classes (institutional, individual, and foreign shareholdings) and debt holdings. The descriptive statistics of the data indicate that largely all the investment related variables trended upward over the period. Also new investments over the period averages around 18 – 36% of the period's capital stock.

# CHAPTER FIVE

# ANALYSIS AND DISCUSSION OF RESULTS

## 5.1 Introduction

The chapter presents regression results and looks at the analysis of the findings. The results of the study were presented using tables. The results were presented and the findings analyzed in relation to the objectives of the study. Thus the chapter is organized by first presenting results of the regression of investment on cash flows, followed by the results of the impact of equity holdings and finally the results of the impact of debt holdings. All estimations were by first difference GMM specifications developed by Arellano – Bond (1991 & 1998). The results reported are for the two step estimations. $(I/K)_{it}$ is the dependent variable in each model. Instruments used in GMM are dated t-3 and t-4. The study investigates the validity of instruments dated t-2 and finds that they are invalid. Taking the instruments back one period further also left the results unchanged. The Wald statistic is a test for the joint significance of the independent variables. Also m1 and m2 are tests for the absence of first order and second order correlation in the residuals respectively. The two are asymptotically distributed as standard normal under the null of no serial correlations. Finally, the Sargan statistic is a test of the over identifying restrictions.

## 5.2 Regression of Investment on Cash Flows

The study first estimates the model outlined in equation (1). In Table 5.1 the study reports the estimates for equation (1). The findings indicate that the estimated coefficients are largely consistent with the structural predictions by Bond & Meghir (1994). The coefficient on the lagged dependent variable is positive and significant. Second, the coefficient of the squared

investment lagged term is negative, and significantly less than -1 (in absolute terms) as implied by the model specifications. Moreover the output coefficient is positive and significant. This is consistent with the presence of imperfect competition in the product market (Bond & Meghir, 19945). However, contrary to Bond & Meghir (1994) and Chen et al (2013), the debt coefficient is positive and significant. This result may suggest the "non–separability" between investment and borrowing decisions rather than "the tax-bankruptcy cost explanations" espoused by Bond & Meghir (1994) for their negative coefficient. Thus, firms finance high levels of investment by borrowing.

**Table 5.1: Regression of Investment on Cash Flows**

| | Coefficient | z values | P-values |
|---|---|---|---|
| $(I/K)_{i,(t-1)}$ | 0.5920*** | 6.365 | 0.000 |
| | (0.0930) | | |
| $(I/K)^2_{i,(t-1)}$ | -0.5856*** | -11.142 | 0.000 |
| | (0.0526) | | |
| $(Y/K)_{i,(t-1)}$ | 0.0084*** | 5.864 | 0.000 |
| | (0.0014) | | |
| $(D/K)^2_{i,(t-1)}$ | 0.0001*** | 5.733 | 0.000 |
| | (0.00002) | | |
| $(CF/K)_{i,(t-1)}$ | -0.0029*** | -3.076 | 0.002 |
| | (0.0009) | | |
| Wald | 14836.59 | | |
| *(p-value)* | 0.00 | | |
| m1 test | -1.25 | | |
| *(p-value)* | 0.21 | | |
| m2 test | -0.69 | | |
| *(p-value)* | 0.49 | | |
| Sargan | 18.70 | | |
| *(p-value)* | 0.13 | | |
| Instruments | 18 | | |

Notes: the asterisks ***, **, * stand for significance at 1% level, 5% level and 10% level respectively. Standard errors are in parentheses

The major discrepancy between the findings of this study and majority of the previous studies (for example, Bond & Meghir, 1994, George et al, 2010 and Chen et al 2013) is the negative coefficient found for the cash flow variable. The finding of this study is, however, consistent with the basic theoretical structure of the Euler equations for investment. Bond & Meghir (1994) explain that under the assumption that the firm can raise as much finance as it desires at a given cost, the theoretical model implies that the cash flow coefficient be negative. An exception to this assumption and a positive coefficient on the cash flow term may reflect liquidity constraints. Indeed, it may also reflect non-optimizing behaviour by managers (Hines & Thaler, 1995).

This finding suggests that Ghanaian listed firms face relatively lower financing obstacles or/and less severe corporate control problems, in the sense that increases in cash flows (internal funds) are not expended on capital investments before they are exhausted. Perhaps capital investments are largely financed by debts, especially given the positive relationship between investment and debts. To the extent that stock market listing on average should result in smaller information asymmetries of listed firms, due to the listing and reporting requirements of stock exchanges, such firms have access to perhaps relatively low cost source of investment finance that may reduce the sensitivity of their investment to cash flow fluctuations. Hence, the potential minimal information asymmetry effects and transaction costs for listed firms might account for the generally negative and statistically significant association between cash flows and investments of Ghanaian listed firms. Listed firms face lower financing obstacles and thus, should exhibit lower investment – cash flow sensitivities. This result is consistent with the findings of Oliner & Rudebusch (1992) and Beck et al (2006).

It is also the case that listed firms reasonably face less severe corporate control problems and this might account for the significantly negative link between cash flows and investments for firms listed on an exchange. Indeed Lel, Miller & Reisel (2013) allude to the important governance role stock markets play. They document that the information production and monitoring role of stock markets improves corporate control and that the important governance function of equity markets helps to mitigate agency problems. The tendency and discretion of mangers to invest internal funds is reduced by the improved governance associated with stock markets, thus reducing the responsiveness of investments to cash flow variation. So for firms listed on the stock exchange, there is an improved corporate control, thus believably, reducing managerial waste of internal finance on less productive investments and ultimately accounting for the negative effects of cash flow on investments for such firms.

### 5.3 The Effects of Shareholding Structure on Investment Cash Flow Sensitivity

The study estimates the model outlined in equation (2) in order to investigate the effect of equity claims on the investment cash flow sensitivity. In estimating equation (2), the study interacts the cash flow variable with a dummy variable representing the respective shareholding classifications. The study defines a dummy variable set to one if the shareholding classification holds and zero otherwise. The dummy variable is then interacted with the cash flow variable in order to isolate the effects of the particular shareholding classification on the relationship between cash flows and investment. Table 5.2 reports the interaction results.

**Table 5.2: Results of the Effects of Equity Holdings**

| | Coefficient | z values | P-values |
|---|---|---|---|
| $(I/K)_{i,(t-1)}$ | 0.6096*** | 6.465 | 0.000 |
| | (0.0943) | | |
| $(I/K)^2_{i,(t-1)}$ | -0.6064*** | -11.806 | 0.000 |
| | (0.0514) | | |
| $(Y/K)_{i,(t-1)}$ | 0.0097*** | 8.458 | 0.000 |
| | (0.0011) | | |
| $(D/K)^2_{i,(t-1)}$ | 0.0001*** | 5.755 | 0.000 |
| | (0.00002) | | |
| $(CF/K)_{i,(t-1)}$ | -2.0113*** | -13.917 | 0.000 |
| | (0.1445) | | |
| $(CF/K)_{i,(t-1)}$*INST. | 2.0058*** | 13.578 | 0.000 |
| | (0.1477) | | |
| $(CF/K)_{i,(t-1)}$*IND. | 1.8976*** | 11.809 | 0.000 |
| | (0.1607) | | |
| $(CF/K)_{i,(t-1)}$*FOREIGN | 2.0090*** | 13.913 | 0.000 |
| | (0.1444) | | |
| Wald | 24255.87 | | |
| *(p-value)* | 0.00 | | |
| m1 test | -1.61 | | |
| *(p-value)* | 0.11 | | |
| m2 test | -7.57 | | |
| *(p-value)* | 0.45 | | |
| Sargan | 17.76 | | |
| *(p-value)* | 0.17 | | |
| Instruments | 21 | | |

Notes: the asterisks ***, **, * stand for significance at 1% level, 5% level and 10% level respectively. Standard errors are in parentheses

Table 5.2 depicts that the shareholder identities indeed have different effects on the sensitivity of investment to cash flows. A test of differences indicates statistically insignificant differences in the effects of foreign and institutional shareholder classes on the sensitivity of investment to cash flows. However, both shareholder classes differ significantly from individual shareholdings, in their effects on the sensitivity of investment to internal funds. Institutional, individual and foreign shareholdings all lead to significant positive response of firms' investment to internal

finance. It does not seem appropriate at least in the Ghanaian case to argue that institutional, individual and foreign shareholdings increase the cost of external finance. Thus, this result is driven by a possible lack of or inadequate "good" corporate governance. Ineffective corporate monitoring increases the scope of managerial discretion to spend whenever internal funds are available. Hence, this result implies that for Ghanaian listed firms, institutional, foreign and individual controlling interests in firms offer ineffective corporate monitoring and thus, drive the statistically significant positive response of investment to cash flow for these firms. This result is consistent with Pawlina & Reneeboog (2005), Wei & Zhang (2008) and Chen et al (2013) who report comparable findings for the London Stock Exchange, East Asia emerging markets and Chinese capital market respectively.

The results as presented in Table 5.2 show that, institutional and foreign shareholdings have higher investment cash flow sensitivities than individual shareholdings. This relatively stronger positive relationship between cash flows and investment for institutional and foreign shareholdings is particularly strange given that corporate governance is expected to improve with the presence of institutional and foreign shareholdings than individual shareholdings. Perhaps this result could best be explained by the contention by Chen et al (2013) to the effect that better managed firms are more popular with the private investor. Also, the passive participation of institutional and foreign shareholders in corporate governance might be because their stakes in these firms represent only a tiny fraction of their overall portfolio.

## 5.4 The Effects of Debt Holdings on Investment Cash Flow Sensitivities

Another ownership structure variable considered was debt claims. Ownership structure was defined in line with Jensen & Meckling (1976). It was defined in terms of capital contributions and includes equity and debt holdings. The study considers the influence of debt claims on the

sensitivity of investment to cash flows by estimating the model outlined in equation (3). The estimation was done in exactly the same manner as in the case of assessing the effects of shareholding classifications. However, in this case the study defines a dummy variable which is set to zero for firms with low debt and one for firms with high debt. Table 5.3 presents results of the effects of debts claims on the sensitivity of firms' investment to cash flows.

**Table 5.3 Results of the Effects of Debt Holdings**

| | Coefficient | z values | P-values |
|---|---|---|---|
| $(I/K)_{i,(t-1)}$ | 0.5498*** | 5.632 | 0.000 |
| | (0.0976) | | |
| $(I/K)^2_{i,(t-1)}$ | -0.5266*** | -8.067 | 0.000 |
| | (0.0653) | | |
| $(Y/K)_{i,(t-1)}$ | 0.0086*** | 8.762 | 0.000 |
| | (0.0010) | | |
| $(D/K)^2_{i,(t-1)}$ | 0.0001*** | 5.809 | 0.000 |
| | (0.00002) | | |
| $(CF/K)_{i,(t-1)}$ | -0.0611* | -1.777 | 0.076 |
| | (0.0344) | | |
| $(CF/K)_{i,(t-1)}$*Debt | 0.0584* | 1.698 | 0.089 |
| | (0.0344) | | |
| Wald | 22399.46 | | |
| *(p-value)* | 0.00 | | |
| m1 test | -1.25 | | |
| *(p-value)* | 0.21 | | |
| m2 test | -0.68 | | |
| *(p-value)* | 0.49 | | |
| Sargan | 17.79 | | |
| *(p-value)* | 0.17 | | |
| Instruments | 19 | | |

Notes: the asterisks ***, **, * stand for significance at 1% level, 5% level and 10% level respectively. Standard errors are in parentheses

The coefficient is significantly positive for firms with high debt holdings. This provides evidence in support of the cash constraint hypothesis. From the liquidity constraints perspective, firms with relatively high debt are always in danger of under-investment due to the costs of raising new finance (Stulz, 1990). Leverage has its associated costs and bankruptcy costs. Thus, in as much as firms undertake higher levels of investment by borrowing, high levels of debt holdings increase the cost of external finance and firms with high debt holdings, have less access to external finance. Although tax advantages may make debt financing attractive at low levels of borrowing, the probability of bankruptcy arises with increasing debts and the presence of bankruptcy cost makes debt finance increasingly expensive. Thus, firms with high debt holdings have high investment cash flows sensitivities. Essentially, this result implies that high debt holding firms may face higher costs of venturing into external capital markets compared to low debt holding firms and may under-invest or even forego investments particularly in the presence of little or no internal funds. For high debt holding firms, cash flow plays an important role in alleviating their credit frictions.

## 5.5 Chapter Summary

In this chapter, the study estimated the specification models outlined in equations (1), (2) and (3). The results of the regression of investment on cash flows and the moderating effects of shareholdings and debt holdings on the investment cash flow relationships were presented in tables. The analysis of the results indicates that, contrary to findings by Bond & Meghir (1994), George et al (2010), Chen et al (2013) and indeed majority of the previous studies, the cash flow variable has a negative coefficient indicating low sensitivity of investment to internal finance for Ghanaian listed firms. This result is consistent with the model specifications. This finding may imply that Ghanaian listed firms have low liquidity constraints and can raise as much finance as

they desire at a given cost. It may also imply that firms listed on the Ghana Stock Exchange face less severe corporate control problems, thus reducing the tendency of managers to invest cash flows.

However the estimation for shareholding classifications indicates that, there is a significantly positive influence of cash flows of the investment. It seems that at least in the Ghanaian case, the results for different shareholder classes are driven by corporate governance arguments. This is consistent with the findings by Pawlina & Renneboog (2005), Wei & Zhang (2008) and Chen et al (2013) for the London Stock Exchange, East Asia emerging markets and Chinese listed firms respectively. Also the estimation of the influence of debt holdings indicates significant positive effects of cash flows for firms with high debt holdings. The study believes that such result is an indication of the impact of financial constraint arguments than managerial discretion hypothesis.

# CHAPTER SIX

# SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

## 6.1 Summary

In the presence of imperfect capital markets, firms face a cost differential between external and internal sources of funds and under these conditions, Fazzari, Hubbard, and Petersen (1988) argue that, the financially constrained firms would exhibit higher investment-cash flow sensitivity. This result has been corroborated severally (for example Whited, 1992; Gertler & Gilchrist, 1994; Kato et al., 2002; Moyen, 2004 etc.). However, Kaplan & Zingales (1997) offer a challenge to such interpretations. They report contradictory evidence using data on US firms. Such opposing evidence had also been provided by Cleary (1999) using data on US firms, and Kadapakkam et al (1998) and Cleary (2001) using international data. Hines & Thaler (1995), suggest that the sensitivity of firms' investment to internal funds, might be because of non-optimizing behaviour by managers.

Using data for a sample of Ghanaian listed firms during the period of 2007 – 2013, this study investigates the sensitivity of firms' investment to the availability of internal funds using the Euler equation investment framework consistent with the Bond & Meghir's (1994) dynamic investment model. Aside examining whether cash flow effects on firms' investments depict financial constraints underpinned largely by information asymmetry problems, the study investigates also whether statistically significant positive responsiveness of investments to cash flows may be driven by corporate governance issues. The study utilizes information on the ownership structure of the firms. While previous studies have looked at the effects of shareholding classes on the sensitivity of investment to cash flows, this study defined ownership

structure consistent with Jensen & Meckling (1976) to include equity and debt holdings and investigates the moderating effect of equity and debt holdings on the investment cash flows sensitivity. Thus, if specific shareholding classes fail to offer effective corporate governance and monitoring of managerial discretions then a significant positive relationship between investment spending and cash flows is expected. And also high levels of debt holdings should increase bankruptcy costs and thus increase the sensitivity of investment to cash flows.

## 6.2 Conclusions

The analysis of the results indicates that the cash flow variable has a negative coefficient, indicating low sensitivity of investment to internal finance for Ghanaian listed firms. Thus the investments of Ghanaian listed firms are not significantly dependent on internal sources of funds. This may suggest that firms listed on the Ghana Stock Exchange meet fewer difficulties in raising external finance or/and face less severe corporate governance problems thus reducing mangers' tendency and discretion to invest internal funds. This is indeed contrary to findings by Bond & Meghir (1994), George et al (2010), Chen et al (2013) and in fact majority of the previous studies. This result is, however, consistent with the model specifications. This result provides support for evidences provided by Oliner & Rudebusch (1992), that listed firms have lower investment – cash flow sensitivities. They contend that on average listed firms should suffer smaller information asymmetry problems due to the listing and reporting requirements of stock exchanges. Also Beck et al (2006) expect that firms that are listed on a stock exchange face lower financing obstacles. Besides Lel, et al, (2013) allude to the fact that the information production and monitoring role of stock markets improve corporate control and help to mitigate agency problems thus reducing the tendency and discretion of mangers to invest internal funds.

However the results for the shareholding classes indicate that, there is a significantly positive influence of cash flows on investment. The study used the theoretical and empirical predictions to be able to identify whether this result is more likely to be due to corporate governance problems or financial constraint problems. It seems that at least in the Ghanaian case, the results for different shareholder classes are driven by corporate governance arguments. This is consistent with the findings by Pawlina & Renneboog (2005), Wei & Zhang (2008) and Chen et al (2013) for the London Stock Exchange, East Asia emerging markets and Chinese listed firms respectively. Even though corporate governance was expected to improve with the presence of institutional and foreign shareholdings than individual shareholdings, institutional and foreign controlled firms have a stronger cash flow effects on investment. This result seems to imply passive participation by these shareholders in the corporate governance of the individual firms. Perhaps their stakes in these firms only represent a tiny fraction of their portfolio.

The study also documents significant positive effects of cash flows for firms with high debt holdings. The study believes that such result is an indication of the impact of financial constraint arguments than managerial discretion hypothesis. Thus, firms with high debt holdings exhibit higher investment cash flow sensitivity, indicating severer difficulty in raising external funds to finance their investments. For firms with high debt holding, internal finance play an important role in alleviating their credit frictions. The dependent of investment on the availability of profits implies that capital investments of these firms will be more sensitive to economic and commercial activity than will otherwise be.

## 6.3 Recommendations

The findings of this study informed the following recommendations:

The results of this study indicate that Ghanaian listed firms generally face lesser information asymmetries and corporate control problems. The Security and Exchange Commission and other regulators of the GSE should be encouraged and perhaps influenced to continue progress on further bringing a greater level of transparency, disclosure of information, monitoring and pursue the path towards stock market development and market based efficiency.

It is evident that notwithstanding the growing nature of the Ghana Stock Exchange, there appear to be issues with the corporate governance of listed firms at least for the period of this study. The results for the effect of shareholder classes on the investment – cash flow sensitivity shows instances of corporate governance failures. Even though Abor (2007) called for increasing attention to corporate governance of listed firms, it appears much more is needed to complement the efforts of the Ghana Securities and Exchange Commission in ensuring effective corporate governance practices.

The SEC must consider including in its listing requirements the formation of Governance Committees. The composition of the Governance Committee should exclude the Managing Director, CEO and other members of the executive management team so as to increase independence. Also to ensure the necessary independence and to eschew any potential conflict of interest, the Managing Director and members of the executive management team should play no part in the selection of directors to serve on the Governance Committee. Among others the Governance Committee should have a duty of prioritizing shareholder returns over "unnecessary" value maximization.

The study's results also show the existence of docile shareholders. Regulators should institute annual working group on promoting genuine engagements from particularly institutional and foreign shareholders. Shareholders should be encouraged to see non-optimizing behaviours by managers as a principal risk to the company's business and consider active participation in the corporate governance of these firms and management monitoring as an appropriate system to manage these risks.

Another result from this study is that high debt lowers the financial flexibility of firms and also poses substantial risks of being under funded. It is important that management of firms, promotes close and continuing dialogue with the investment community. This offers managers the opportunity to understand and be kept abreast with investor preferences and general shifts in investment philosophy. With this managers are able to identify new opportunities and any potential vulnerability that can inform the offer of new instruments that better match investors' needs thus attracting any much needed investible funds. The potential in this is that funding disruptions can be limited while investors are assured that they are being treated equitably thus mitigating adverse funding conditions.

Also, companies would be required to establish sound debt policies. It is important that managers pursue efficiently their responsibility of balancing the company's financial needs with its ability to obtain financing while taking cognizance of the various considerations in debt financing. In order to avoid a strategic policy failure due to lack of corporate purchasing power, managers would be required to preserve continuity in the flow of funds. It is important that companies constantly develop new institutional sources and attempt to broaden the range of financing alternatives. However, traditional sources of funds should be cherished and mostly relied on

since critically important programmes, particularly in times of adversity would require well established and reliable sources of capital.

There is the need for a careful policy design on the development of not just the capital markets, but also the financial market in general. Policies, including financial sector reforms should be guided largely by the desire to encourage competition and promote the efficiency of financial markets. Indeed, there is the need to provide full support for the role of banks and other financial intermediaries in supplying funds to productive investments. This is crucial to avoid any under investment by firms and its ramifications for the rate of economic growth and development of the country.

This current study can be extended in several other directions. One such direction is to investigate the role of internal finance in the investment decisions of firms that do not have access to the stock market. It will be particularly interesting to analyse differences in the sensitivity of investment to internal funds, according to the extent to which firms have access to the stock market. Future research should investigate further the idea that variables that affect cash holding abilities or/and affect the cost of raising external finance may also influence corporate investments' sensitivity to internal funds. One such area is to examine whether the investment cash flow sensitivity vary according to the extent of dividend payouts. Also future research could investigate whether the impact of company taxes on investment will be more than just the impact of taxes on the cost of capital, given the importance of profits in determining investment spending.

# BIBLIOGRAPHY

Abor, J. (2007). Corporate governance and financing decisions of Ghanaian listed firms. *Corporate Governance: The International Journal of Business in Society, 7 (1)* , 83-92.

Abor, J. (2005). The effect of capital structure on profitability: An empirical analysis of listed firms in Ghana. *The Journal of Risk Finance, 6 (5)* , 438 - 445.

Aggarwal, R., & Zong, S. (2006). The cash flow - investment relationship: International evidence of limited access to external finance. *Journal of Multinational Financial Management, 16* , 89-104.

Akerlof, G. (1970). The market for "lemons": Quality uncertainty and the market mechanism. *Quarterly Journal of Economics* , 488 - 500.

Almeida, H., & Campello, M. (2002). Financial constraints and investment - cash flow sensitivities: New research directions. *Working Paper* .

Almeida, H., & Campello, M. (2007). Financial constraints, asset tangibility and corporate investment. *Review of Financial Studies, 20* , 1429-1460.

Amidu, M., & Abor, J. (2006). Determinants of dividend payout ratios in Ghana. *Journal of Risk Finance, 7 (2)* , 136-145.

Arrelano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies, 58*, 277 - 297.

Atley, M. J., & Laumas, P. (1994). Internal funds and corporate funds in India. *Journal of Development Economics, 45* , 287-303.

Beck, T., Demirguc-Kunt, A., Laeven, L., & Maksimovic, V. (2006). The determinants of financing obstacles. *Journal of International Money and Finance, 25* , 932-952.

Blouin, J., Ready, J., & Shackelford, D. (2004). The initial impact of the 2003 reduction in the dividend tax rate. *working Paper, University of North Carolina, .*

Bokpin, G. (2011). Ownership structure, corporate governance and dividend performance on the Ghana Stock Exchange. *Journal of Applied Accounting Research, 12 (1)* , 61-73.

Bokpin, G. (2008). Ownership concentration and corporate performance on the Ghana Stock Exchange: A panel data estimation. *Journal of Corporate Ownership and Control, 5 (4)*, 196 - 203.

Bokpin, G., & Isshaq, Z. (2009). Corporate governance, disclosures and foreign share ownership on the Ghana Stock Exchange. *Managerial Auditing Journal, 24 (7)*, 688 - 703.

Bond, S., Elston, J. A., Mairesse, J., & Mulkay, B. (2003). Financial factors and investment in Belgium, France, Germany and the United Kingdom: A comparison using company panel data. *Review of Economics and Statistics, 85* , 153-165.

Bond, S., & Meghir, C. (1994). Dynamic investment models and the firm's financial policy. *The Review of Economic Studies, 61* , 197 - 222.

Bond, S., & Meghir, C. (1994). Financial constraints and company investment. *Fiscal Studies, 15 (2)*, 1-18.

Carpenter, R., & Guariglia, A. (2003). Cash flow, investment, and investment opportunities: New tests using UK panel data. *Discussion Paper, 03/24* . (http://repec.org/res2003/Guariglia.pdf)

Carpenter, R. E., & Guariglia, A. (2008). Cashflow, investment and investment opportunities: New tests using U.K. panel data. *Journal of Banking and Finance*

Chang, S., & Hong, J. (2000). Economic performance of group-affiliated companies in Korea: intragroup resource sharing and internal business transactions. *Academy of Management Journal, 43* , 429 - 448.

Chatelain, J.-B., Ehrmann, M., Generale, A., Martinez-Pages, J., Vermeulen, P., & Worms, A. (2003). Monetary transmission in the Euro Area: New evidence from micro data on firms and banks. *Journal of the European Economic Association, 1* , 731-742.

Chen, A., Cao, H., Zhang, D., & Dickinson, D. (2013). The impact of shareholding structure on firm investment: Evidence from Chinese listed companies. *Pacific - Basin Finance Journal, 25* , 85 - 100.

Chen, M. (2008). Financial constraints and the investment of Chinese listed firms. *Discussion Paper*, retrieved from www.ceauk.org.uk/2008-conference-papers/Minjia-Chen.doc *(20/3/2015)*.

Chetty, R., & Saez, E. (2005). Dividend taxes and corporate behaviour: Evidence from the 2003 dividend tax cut. *Quarterly Journal of Economics, 120 (3)* , 791 - 833.

Chirinko, R. (1997). Financial constraints, liquidity and investment spending: Theoretical restrictions and international evidence. *Journal of the Japanese and International Economics, 11* , 185-207.

Cleary, S. (1999). The relationship between firm investment and financial status. *Journal of Finance, LIV* , 673-692.

Conyon, S., & Murphy, K. (2000). The price and the pauper? CEO pay in the US and the UK. *Economic Journal, 110* , 640-71.

Degryse, H., & de Jong, A. (2006). Investment and internal finance: Asymmetric information or managerial discretion? *International Journal of Industrial Organization, 24* , 125-147.

Deloof, M. (1998). Internal capital markets, bank borrowing and financing constraints: evidence from Belgium firms. *Journal of Business Finance and Accounting, 25* , 945-968.

Demirguc-Kunt, A., & Maksimovic, V. (1998). Law, finance, and firm growth. *Journal of Finance, 53 (6)* , 2107 - 2137.

Devereux, M., & Schiantarelli, F. (1990). Investment, financial factors, and cash flow: evidence from UK panel data. (H. R. G., Ed.) 279-306.

Dyck, A., & Zingales, L. (2004). Private benefits of control: An international comparison. *Journal of Finance, 59* , 537-600.

Easterbrook, F. (1984). Two agency - cost explanations of dividends. *American Economic Review, 74* , 650 - 659.

Fama, E. & French, K. (2002). Testing trade-off and pecking order predictions about dividends and debt. *The Review of Financial Studies* 15: 1–33. http://dx.doi.org/10.1093/rfs/15.1.1

Fauzi, F., & Locke, S. (2012). Do agency costs really matter? A non-linear approach of panel data. *Asian Journal of Finance & Accounting*.

Fazzari, S. M., Hubbard, R. G., & Petersen, B. C. (1988). Financing constraints and corporate investment. *Brookings Papers on Economic Activity, 1* , 141-195.

Fazzari, S. M., Hubbard, R. G., & Petersen, B. C. (2000). Investment - cash flow sensitivities are useful: A comment on Kaplan and Zingales. *Quarterly Journal of Economics 115* , 695-705.

Fenn, G., & Liang, N. (2001). Corporate payout policy and managerial stock incentives. *Journal of Financial Economics, 60 (1)* , 3-43.

Fodio, M., Onah, R., & Oba, V. (2013). Impact of cash flow on investment levels in quoted Nigerian manufacturing firms. *Research Journal of Finance and Accounting, 4 (12)* .

Gelos, G., & Werner, A. (2002). Financial liberalization, credit constraints and collateral: Investment in the Mexican manufacturing sector. *Journal of Development Economics, 67 (1)* , 1-27.

George, R., Kabir, R., & Qian, J. (2010). Investment-cash flow sensitivity and financing constraints: new evidence from Indian business group firms.

Georgen, M., & Renneboog, L. (2001). Investment policy, internal financing and ownership concentration in the UK. *Journal of Corporate Finance, 7* , 257 - 284.

Gertler, M., & Gilchrist, S. (1994). Monetary policy, business cycles and the behaviour of small manufacturing firms. *Quarterly Journal of Economics, 109* , 309-340.

Gilchrist, S., & Himmelberg, C. P. (1995). Evidence on the role of cash flow for investment. *Journal of Monetary Economics, 36* , 541-572.

Greenwald, B., Stiglitz, J., & Weiss, A. (1984). Information imperfections and macroeconomic fluctuations. *American Economic Review, LXXIV* , 194-199.

Gugler, K. (2003). Corporate governance and investment. *International Journal of the Economics of Business, 10* , 261-289.

Gugler, K. (2003). Corporate governance, dividend payout policy, and the interrelation between dividends, R&D, and capital investment. *Journal of Banking and Finance, 27 (7)* , 1297-1321.

Gyeke-Dako, A. (2007). *Foreign-owned firms and financial constraints: Evidence from Ghana.* University of Nottingham, School of Economics.

Hadlock, C. (1998). Ownership, liquidity, and investment. *RAND Journal of Economics, 29* , 487 - 508.

Harrison, A. E., & McMillan, M. S. (2003). Does direct foreign investment affect domestic firms' credit constraints? *Journal of International Economics, 61(1),* 73-100.

Hayashi, F. (1982). Tobin's marginal q and average q: A neoclassical interpretation . *Econometricia, L* , 213 - 224.

Hines, J., & Thaler, R. (1995). The flypaper effect. *Journal of Economic Perspectives, 9 (4)* , 217 - 226.

Holtz-Eakin, D., Newey, W., & Rosen, H. S. (1988). Estimating vector autoregressions with panel data. *Econometrica, 56,* 1371 - 1395.

Hoshi, T., Kashyap, A., & Scharfstein, D. (1991). Corporate structure, liquidity and investment: evidence from Japanese industrial groups. *Quarterly Journal of Economics, 106* , 33-60.

Hu, X., & Schiantarelli, F. (1998). Investment and capital market imperfections: A switching regression approach using U. S. firm panel data. *Review of Economics and Statistics, 80* , 466-479.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review, 76* , 323-329.

Jensen, M., & Meckling, W. (1976). Theory of the firm: managerial behaviour, agency costs and ownership structure. *Journal of Financial Economics, 3 (4)* , 305-360.

Jorgenson, D. W. (1963). Capital theory and investment behaviour. *American Economic Review,* 247-259.

Jorgenson, D., (1971). Econometric studies of investment behavior: A survey. *Journal of Economic Literature,* vol. 9, no. 4, 1111---1147.

Judson, R., & Owen, A. (1996). Estimating dynamic panel data models: A practical guide for macroeconomics. *Working Paper* .

Kadapakkam, P.-R., Kumar, P. C., & Riddick, L. A. (1998). The impact of cash flows and firm size on investment: the internal evidence. *Journal of Banking and Finance, 22* , 293-320.

Kaplan, S. N. (1997). Do investment-cash flow sensitivities provide useful measures of financing constraints? *Quarterly Journal of Economics, 02*.

Kaplan, S., & Zingales, L. (1997). Do financing constraints explain why investment is correlated with cash flow. *Quarterly Journal of Economics, CXII* , 169-215.

Kato, H., Loewenstein, U., & Tsay, W. (2002). Dividend policy, cash flow, and investment in Japan. *Pacific-Basin Finance Journal, 10* , 443-473.

Khanna, T., & Palegu, K. (2000). Is group affiliation profitable in emerging markets? An analysis of diversified Indian business groups. *Journal of Finance, 55* , 867-891.

Laeven, L. (2003). Does financial liberalization reduce financing constraints? *Financial Management, 32 (1)* , 5-34.

Lang, L., Ofek, E., & Stulz, R. (1996). Leverage, investment and firm growth. *Journal of Financial Economics, 40* , 3-29.

Lel, U., Miller, D., & Reisel, N. (2013). Differences in agency problems between public and private firms: Evidence from top management turnover. Retrieved April 22, 2015, from conference.darden.virginia.edu/ifc/Selected2014/LelMillerReisel.pdf

Lensink, R., Van der Molen, R., & Gangopadhyay, S. (2003). Business groups, financing constraints and investments: the case of India. *Journal of Development Studies, 40* , 93-119.

Love, L. (2003). Financial development and financing constraints: International evidence from the structural investment model. *Review of Financial Studies, 16 (3)* , 765-791.

McColgan, P. (2001). Agency theory and corporate governance: A review of the literature from a UK perspective. *Working Paper* .

Melander, O. (2009). The effect of cash flow on investment: An empirical test of the balance sheet channel. *Sveriges Riksbank Working Paper Series, 228* .

Miller, M., & Rock, K. (1985). Dividend policy under asymmetric information. *Journal of Finance, 40 (4)* , 1031-1051.

Mileva, E. (2007). *Using Arellano – Bond Dynamic Panel GMM Estimators in Stata.* Fordham University, Economics Department. Retrieved from www.academia.edu/../Elitz

Mizen, P., & Vermeulen, P. (2005). Corporate investment and cash flow sensitivity: What drives the relationship. *European Central Bank Working Paper Series, 485* .

Modigliani, F., & Miller, M. (1958). The cost of capital, corporate finance and the theory of investment. *American Economic Review, 48*, 261 - 297.

Moyen, N. (2004). Investment-cash flow sensitivities: Constrained and unconstrained firms. *Journal of Finance, 59* , 2061-2092.

Mueller, D. C., (2003). *The corporation: Investment, mergers and growth.* Routledge

Myers, S. (1977). Determinants of corporate borrowing. *Journal of Financial Economics, 5* , 147-175.

Myers, S. (1984). The capital structure puzzle. *The Journal of Finance* 39: 575–592. http://dx.doi.org/10.2307/2327916

Myers, S., & Majluf, N. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics, XIII* , 187-221.

Nam, N., Wang, J., & Zhang, G. (2004). The impact of dividend tax cut and managerial stock holdings on firm's dividend policy. *Working Paper* .

Oliner, S. D., & Rudebusch, G. D. (1992). Sources of the financing hierarchy for business investment. *The Review of Economics and Statistics, 74* , 643-654.

Pawlina, G., & Renneboog, L. (2005). Is investment - cash flow sensitivity caused by agency costs or asymmetric information? Evidence from the UK. *European Financial Management, 11 (4)* , 483-513.

Pindado, J., Requejo, I., & de la Torre, C. (2011). Family control and investment - cash flow sensitivity: Empirical evidence from the Euro zone . *Journal of Corporate Finance, 17* , 1389 - 1409.

Roodman, D. (2006). How to do Xtabond2: An introduction to "Differnce" and "System" GMM in Stata. *Working Paper, 103* .

Schaller, H. (1993). Asymmetric information, liquidity constraints and Canadian investment. *Canadian Journal of Economics, 36(3)* , 552-574.

Schiantarelli, F. (1996). Financial constraints and investment: Methodological issues and international evidence . *Oxford Review of Economic Policy*.

Shin, H.-H., & Park, Y. (1999). Financing constraints and internal capital markets: evidence from Korean 'Chaebols'. *Journal of Corporate Finance, 5* , 169-191.

Shleifer, A., & Vishny, R. (1989). Management entrenchment: The case of manager - specific investments. *Journal of Financial Economics, 25 (1)* , 123 - 139.

Short, H., Keasey, K., & Duxbury, D. (2002). Capital structure, management, ownership and large external shareholders: A UK analysis. *International Journal of the Economics and Business, 9 (3)* , 375-399.

Stiglitz, J., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *American Economic Review* , 393 - 410.

Stock, J., & Watson, M. (2003). *Introduction to econometrics.* New York: Person Addison Wesley.

Stulz, R. (1990). Managerial discretion and optimal financing policies. *Journal of Financial Economics, 26* , 3 - 27.

Tobin, J. (1969). A general equilibrium approach to monetary policy. *J Money Credit Bank, 1 (1)*, 15 - 29.

von Kalckreuth, U. (2003). Investment and monetary transmission in Germany: A microeconometric investigation. (I. Angeloni, A. Kashyap, & B. Mojon, Eds.) *Monetary Policy Transmission in the Euro Area* .

Wei, K., & Zhang, Y. (2008). Ownership structure, cash flow, and capital investment: Evidence from East Asian economies before the financial crises. *Journal of Corporate Finance, 14* , 118-132.

White, L. (1996). Executive compensation and dividend policy. *Journal of Corporate Finance, 2 (4)* , 335-358.

Whited, T. (1992). Debt, liquidity constraints and corporate investment: Evidence from panel data. *Journal of Finance, XLVII* , 1425-60.

Zarzeski, M. T. (1996). Spontaneous harmonization effects of culture and market forces on accounting disclosure practices. *Accounting Horizons 10 (1)* , 18-37.

Zheka, V. (2005). Corporate governance, ownership structure and technical efficiency: The case of Ukraine. *Journal of Management and Decision Economics 26 (7)* , 451-460.

# APPENDIX

Data

***Table A1: Shareholding Classes***

| Shareholding Classes | Number | Percentage |
|---|---|---|
| Individual | 5 | 18.52 |
| Institutional | 6 | 22.22 |
| Foreign | 16 | 59.26 |

***Table A2 List of Companies Sampled***

1 Aluworks Ltd
2 ARYTON DRUG MANUFACTURING LTD
3 African Champion Industries Ltd.
4 AngloGold Ashanti Limited
5 BENSO OIL PALM PLANTATION LIMITED
6 CAL Bank Limited
7 Clydestone Ghana
8 Camelot Ghana
9 ECOBANK GHANA LTD
10 Enterprise Group Limited
11 Ecobank Transnational Incorporated
12 Fan Milk Limited
13 Ghana Commercial Bank Limited
14 Guinness Ghana Breweries Ltd.
15 Golden Star Resources
16 HFC Bank Ltd
17 MECHANICAL LLOYD COMPANY LIMITED
18 Produce Buying Company Ltd
19 PZ CUSSONS GHANA LTD
20 Standard Chartered Bank Ghana Ltd.
21 Societe Generale Ghana Limited
22 Starwin Products Limited
23 TRUST BANK LIMITED (THE GAMBIA)
24 Tullow Oil Plc
25 TOTAL PETROLEUM GHANA LIMITED
26 Unilever Ghana Limited
27 UT Bank

**GMM Estimation Results**

***Table A3: Regression of Investment on Cash Flow***

Arellano-Bond dynamic panel-data estimation — Number of obs = 135
Group variable: Firm — Number of groups = 27
Time variable: Year

Number of instruments = 18 — Wald chi2(5) - 14836.59
Prob > chi2 - 0.0000

Two-step results

| Investment | Coef. | Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| Lag Investment | .5919558 | .0930049 | 6.36 | 0.000 | .4096696 | .774242 |
| Lag Investment Sqd | -.5855843 | .0525568 | -11.14 | 0.000 | -.6885938 | -.4825748 |
| Lag Income | .0083516 | .0014241 | 5.86 | 0.000 | .0055605 | .0111428 |
| Lag Debt Sqd | .0001158 | .0000202 | 5.75 | 0.000 | .0000763 | .0001553 |
| Lag Cash Flow | -.0028782 | .0009356 | -3.08 | 0.002 | -.0047119 | -.0010444 |

Sargan test of overidentifying restrictions
H0: overidentifying restrictions are valid
chi2(13) = 18.70028
Prob > chi2 = 0.1327

Arellano-Bond test for zero autocorrelation in first-differenced errors

| Order | z | Prob > z |
|---|---|---|
| 1 | -1.2516 | 0.2107 |
| 2 | -.68623 | 0.4926 |

H0: no autocorrelation

***Table A4: Effects of Equity Holdings***

Arellano-Bond dynamic panel-data estimation — Number of obs = 135

Group variable: Firm — Number of groups = 27
Time variable: Year

Number of instruments = 21 — Wald chi2(8) = 24255.87
Prob > chi2 = 0.0000

Two-step results

| Investment | Coef. | Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| Lag Investment | .6096439 | .0942964 | 6.47 | 0.000 | .4248263 | .7944614 |
| Lag Investment Sqd | -.6064436 | .0513687 | -11.81 | 0.000 | -.7071244 | -.5057627 |
| Lag Income | .0096686 | .0011431 | 8.46 | 0.000 | .0074281 | .0119091 |
| Lag Debt Sqd | .0001082 | .0000188 | 5.76 | 0.000 | .0000714 | .0001451 |
| Cash Flow | -2.011283 | .1445208 | -13.92 | 0.000 | -2.294538 | -1.728027 |
| Cash Flow*Inst. | 2.005761 | .1477237 | 13.58 | 0.000 | 1.716227 | 2.295294 |
| Cash Flow*Ind. | 1.897553 | .1606903 | 11.81 | 0.000 | 1.582606 | 2.2125 |
| Cash Flow*Foreign | 2.009003 | .1443935 | 13.91 | 0.000 | 1.725997 | 2.292009 |

Sargan test of overidentifying restrictions
H0: overidentifying restrictions are valid
chi2(13) = 17.76061
Prob > chi2 = 0.1668

Arellano-Bond test for zero autocorrelation in first-differenced errors

| Order | z | Prob > z |
|---|---|---|
| 1 | -1.6081 | 0.1078 |
| 2 | -.75651 | 0.4493 |

H0: no autocorrelation

***Table A5: Effects of Debt Holdings***

Arellano-Bond dynamic panel-data estimation Number of obs = 135

Group variable: Firm Number of groups = 27
Time variable: Year

Number of instruments = 19 Wald chi2(6) - 22399.46
Prob > chi2 - 0.0000

Two-step results

| Investment | Coef. | Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| Lag Investment | .5497963 | .0976151 | 5.63 | 0.000 | .3584742 | .7411184 |
| Lag Investment Sqd | -.5266341 | .0652816 | -8.07 | 0.000 | -.6545838 | -.3986845 |
| Lag Income | .0086213 | .0009839 | 8.76 | 0.000 | .0066928 | .0105498 |
| Lag Debt Sqd | .0001156 | .0000199 | 5.82 | 0.000 | .0000766 | .0001545 |
| Cash Flow | -.0610893 | .0343731 | -1.78 | 0.076 | -.1284594 | .0062808 |
| Cash Flow*Debt | .0584179 | .0344001 | 1.70 | 0.089 | -.0090051 | .1258409 |

Sargan test of overidentifying restrictions
H0: overidentifying restrictions are valid
chi2(13) = 17.79449
Prob > chi2 = 0.1655

Arellano-Bond test for zero autocorrelation in first-differenced errors

| Order | z | Prob > z |
|---|---|---|
| 1 | -1.2461 | 0.2127 |
| 2 | -.68348 | 0.4943 |

H0: no autocorrelation