TESTING PECKING ORDER THEORY ON DIVIDEND PAYOUT RATIO IN GHANA

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DECLARATION

This is to certify that this thesis is the result of research undertaken by Isaac Doku towards the award of the Master of Philosophy degree in Economics at the Department of Economics, University of Ghana.

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ABSTRACT

The Pecking Order Theory (POT) suggests that firms prefer internal over external sources of financing investment. For external sources of finance, firms prefer the use of debt before equity to finance investment. However, the POT did not show how the capital structure decision of firms influences their dividend decision. POT can be combined with Lintner's dividend model to generate some predictions for financial leverage. This leads to the conclusion that when firms are faced with earnings shortage, firms will borrow to pay dividend at the expense of profitable investment. This means there will be a positive interaction between financial leverage and dividend payout ratio, and a negative interaction between financial leverage and investment. The theory further predicts that as firms make more profit, they would demand less debt representing a reduction in financial leverage. The predictions of the POT where made based on data from developing countries. However, due to differences in accounting and auditing practices between developed and developing countries, these predictions might not hold in developing economies. A cross sectional analysis was implemented on 33 out of the 34 listed firms on the GSE for the period 2004-2009, employing both the 3SLS and OLS technique to test the predictions in Ghana. The findings indicate that there is a positive significant interaction between financial leverage and dividend payout ratio among listed firms in Ghana. The results further indicate that profitability has the predicted negative influence on financial leverage, indicating that the POT explains dividend payout ratio in Ghana. The results did not show any significant interrelationship between financial leverage and investment, and between investment and dividend payout ratio among listed Ghanaian firms. The results also show that dividend payout ratio in Ghana is very low, therefore, policymakers should strengthen and enforce laws on dividend payment in Ghana.

DEDICATION

This work is dedicated to Mr. George Kabu Okornoe, Mrs. Veronicah Adiamah, Mr. Emmanuel Doku, Evelyn Akwaboa Frimpong and all those who contributed in diverse ways to the success of this study.

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ABBREVIATIONS

AGA   Anglo Gold Ashanti

ARIMA   Autoregressive Integrated Moving Average

BoG   Bank of Ghana

ETI   Ecobank Transnational Incorporated

EURO   Euro

FINSSP   Financial Sector Strategic Plan

GBP   British Pounds

GSE   Ghana Stock Exchange

GSE-CI   Ghana Stock Exchange Composite Index

GSE-FSI   Ghana Stock Exchange Financial Stock Index

ILS   Indirect Least Square

JPY   Japanese Yen

JSE   Johannesberg Stock Exchange

MM   Modigliani and Miller

MPR   Monetary Policy Rate

NPV   Net Present Value

OLS   Ordinary Least Square

POT   Pecking Order Theory

SEC   Securities and Exchange Commission

SIL   The Securities Industry Law

SME's   Small and Medium Enterprises

2SLS   Two Stage Least Square

3SLS   Three Stage Least Square

SURE   Seemingly Unrelated Regression

UK   United Kingdom

US   United States of America

USD   US Dollars

WBES   World Bank Enterprise Survey

CHAPTER ONE

INTRODUCTION

1.1Background

Capital structure has become very prominent in finance literature, as many researchers have developed a high interest in assessing the impact of various forms and sources of capital on the performance of firms in an economy. Firms with no or little capital and are faced with financing constraint should be prepared for winding up, liquidation, bankruptcy, takeover, merger or acquisition. Apparently, this is why Bank of Ghana (BoG) introduced a higher capital requirement for all banks to be implemented between the periods 2009 to 2012. All banks are required to attain a market capitalisation of GH¢60 million by the end of the year 2012. New banks with majority foreign share ownership were required to achieve a minimum capitalisation of GH¢25 million within two years of commencement and GH¢60 million a year later (BoG, 2011). This policy requirement led to the merger between Ecobank Ghana and The Trust Bank, and that between Access Bank PLC and Intercontinental Bank PLC[1].

Various theories have been propounded to guide finance managers to optimally manage their capital structures, but the most commonly used one is the Pecking Order Theory (POT). The POT looks at the best corporate source of finance and it suggests that in the face of a semi-strong efficient market, firms decide to finance new investments with retained earnings over external sources. When internal sources of finance prove insufficient, firms will first choose riskless debt followed by risky debt before thinking of the use of equity to finance investment.

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[1]www.mybusinessweekafrica.com/topheadlines_detail.php?ID=533, July 11, 2012.

Baskin (1989) extended the pecking order theory by explaining that due to information asymmetry, firms may reject profitable investments if they are to finance them using debt, because of the cost associated with raising external finance (debt). This implies that there exists a positive relationship between financial leverage and investment. This formulation is in contrast to the static trade-off theory which predicts a negative relation between financial leverage and investment.

Although the pecking order theory made several predictions, no distinctive prediction regarding dividend payment was outlined. Baskin (1989) claimed that the pecking order theory can be combined with Litner's dividend model (Litner, 1956) to generate some specific predictions for financial leverage. Litner postulated that, firms have a long run dividend payout target, but in the short run, smooth out their dividend payout to avoid fluctuations, especially decreases in dividend payout. As a result, firms would pay and maintain high dividend payout at the expense of profitable projects and finance such projects by using external funds. Baskin concluded that, there is a significant positive relationship between dividend payout and financial leverage, and also intimated that firms prefer to use internal equity to finance investment and to pay dividend than using external sources. This is contrary to the static trade-off theory which suggests that if dividend payouts are high, external financing (debt) would be low, implying a negative relationship between financial leverage and dividend payout ratio.

 Large dividend payout in a period would reduce funds available for investment in subsequent periods and that would lead to the tendency of raising equity or debt in the next period to finance

investment. On the other hand, large investment outlay would lead to a reduction in available funds to finance dividend payout and increase the need for external debt financing during the next period to finance dividend payment. Based on this, the pecking order theory predicts a relationship that exists in the financing decisions of firms, that is, financial leverage, dividend payout and investment decision of corporate firms (Adedeji, 1998).

Corporate investment decision looks at what capital funds are used for and dividend payout is the amount of dividend that is paid to shareholders of a firm. Due to the nature of the study, dividend payout ratio is used as a proxy for dividend payout and that is the proportion of total profit that is paid out to ordinary shareholders as dividends. Financial leverage is the situation whereby a firm uses more external debt in its capital structure. Most literature in finance uses financial gearing in place of financial leverage.

Although the POT did not make clear cut predictions about the interrelationship between dividend payout ratio, financial leverage and investment, a combination of it with Litner's dividend model came out with some predictions. Due to contextual and institutional differences, the results might not necessarily apply in developing countries, so there is the need for more empirical research from transitional and developing countries.

This study therefore seeks to add to the finance literature by testing the predictions of the combination of POT and Litner's dividend model about the relationship existing between financial leverage, investment and dividend payout ratio of listed firms in Ghana.

1.2 Problem Statement

Baskin (1989) and Allen (1993) studied the effect of dividend yield and investment on financial leverage in the United States of America and Australia respectively. Adedeji (2002) further looked at the interrelationship between financial leverage, investment and dividend payout ratio in the United Kingdom. This implies that most of the studies done in this area were in developed countries. This calls for more empirical research from developing countries. The reason is that finance objectives and practices in developing countries differ from that of developed countries.

There are several reasons that account for the difference in finance objectives between developed and developing countries. Cobham and Subramaniam (1998) point out that accounting and auditing standards in transitional economies are relatively lax as compared to those in developed countries. This shows that information asymmetry is more problematic and pervasive in developing countries (Tong and Green, 2005). In addition, capital markets in developing countries are less developed and so have a narrower range of financial instruments available, and a wider range of constraints on financing decisions than developed countries (Singh and Hamid, 1992, Tong and Green, 2005). Finally, developing countries are now shifting from state enterprises to privatization, shifting the goals and corporate strategies from their initial objectives. This has led to reliance on private financial institutions and organized capital markets to finance companies in developing countries (Abor, 2008). Prasad et al. (2001) concludes that corporate strategy is a significant determinant of capital structure, independent of the goals of the company.

The Financial Sector Strategic Plan (FINSSP, 2002) of Ghana pointed out that Ghana forms part of countries that have small financial sectors. Small financial sectors are found in countries that are usually small, have open economies and with small population. The Ghanaian capital market is small in terms of the instruments traded and the number of participants relative to that of UK. Trading on the Ghanaian Stock Exchange is discontinuous, which means the total value traded is less than 1% of GDP and turnover is below 4% (www.imf.org/external/pubs/ft/survey/so/2008).

Small markets are generally incomplete, shallow, poorly regulated, illiquid, prone to lack of competition and concentration in the provision of services, inefficient and characterized by relatively high transaction costs (FINSSP, 2002). The characteristics of small markets pose constraints on the financial sector and impair investment and hence growth according to the Financial Sector Strategic Plan (FINSSP, 2002) of Ghana.

Osei (1998) contends that the Ghanaian capital market has not played its role in capital mobilization and that the main source of finance in Ghana is mostly from external sources and foreign investors. This is due to insufficient supply of shares and a small number of quoted firms, insufficient demand for securities, overdependence of companies on bank finance, low turnover and liquidity problems and high transaction cost (Anfom, 2008). Due to the weaknesses in the Ghanaian capital market, most firms may resort to low dividend payout in order to plough back profit to finance investment. If that happens, there will be a negative relationship between dividend and investment as predicted by the pecking order theory. On the other hand, some corporate firms may decide to increase dividend payout and fall on debt (increase in financial leverage) to finance investment, this will result in a positive relationship between dividend

payout ratio and investment, which is contrary to the pecking order theory. This study finds out the relationship that exists between dividend payout ratio and investment among listed firms in Ghana.

Research concerning the capital structure of firms in developing countries is scanty and there is no harmony in the conclusion of the few studies available. Singh and Hamid (1992) and Singh (1995) argued that firms in developing countries use more external sources of finance than internal sources to finance investment, contrary to what happens in developed countries. They further realised that most firms in developing countries use more equity than debt. This result seems shocking, considering that capital markets in developing countries are less developed as compared to those in developed countries. Cobham and Subramaniam (1998) disputed the Singh and Hamid (1992) results, at least for Indian firms. They concluded that firms in India use more internal sources of finance than external sources, and the debt ratio of India is similar to that of Britain. Boot et al. (2001) found that debt ratios in developing countries vary from country to country but is similar to that of developed countries. All three researches agree that there are inter country differences in debt ratios across developing countries. This study seeks to add to the finance literature by providing evidence from Ghana.

1.3. Objectives of the Study

The general objective of the study is to find out how the pecking order theory explains dividend payout ratio among listed firms in Ghana.

The specific objectives are to;

- Determine the interaction between dividend payout ratio, financial leverage and investment.

- Find out the impact of profitability on dividend payout ratio, financial leverage and investment.

1.4. Research Question

In order to achieve the objectives of this study, the following research questions needed to be answered:

- How does the pecking order theory explain dividend payout ratio among listed firms in Ghana?

- Are there any interactions between dividend payout ratio, financial leverage and investment?

- How does profitability impact on dividend payout ratio, financial leverage and investment?

1.5. Justification of the Study

Pecking order theory suggests that firms prefer internal sources of finance to external sources of financing dividend and investment. Firms prefer external sources of finance in cases where they suffer earnings shortage a period. Most firms prefer to borrow to finance investment and to payout dividend when they suffer earnings shortage, this portrays a positive impact of dividend and investment on financial leverage. The reason is that, firms that fail to pay dividends have an

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effect on their share price and the value of their firm. That is why Adedeji (1998) explained that, firms respond to their earnings shortage by forgoing investment and borrowing to finance dividend, this shows a positive relation between financial leverage and dividend payout but a negative relationship between financial leverage and investment. He stated that if earnings shortage continues overtime, firms would be expected to adjust their dividend payout to suit their new levels of earnings. This leads to a negative interaction between the long term values of dividend payout and investment.

The study by Allen (1993) found out that there is a positive interaction between financial leverage and investment among firms in Australia. Adedeji (1998) also found a positive significant impact of investment on financial leverage, while financial leverage shows no significant effect on investment. This led him to conclude that there is no interaction between financial leverage and investment among UK firms. This study adds to the finance literature by finding out how Ghanaian firms respond to earnings shortage? Identifying how firms respond to their earnings shortage would help policy makers in their quest to encourage firms to pay dividends and to use debt in their capital structure.

The findings would provide a learning base for finance practitioners and policy makers on how listed firms and other firms in Ghana operate and what pitfalls need to be avoided for firms to be sustainable.

1.6. Organisation of the Study

The research is organized into six main chapters with various subheadings. Chapter one of the research with the title Introduction gives a brief background to the study including the objectives, problem statement and justification of the study. Chapter two looks at both theoretical and empirical literature review. The next chapter considers the performance of the Ghanaian Stock Exchange and its role in capital mobilisation. Then the study will proceed by looking at the methodology including the theoretical framework and the sample of study. Chapter five looks at data analysis and chapter six looks at summary, recommendations and conclusion.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The focus of this chapter is to review theoretical and empirical literature pertaining to capital structure theories and dividend payout ratio. The two main theories of capital structure, which is Pecking Order Theory (POT) and Static Trade-off Theory (SOT) would be analysed. Predictions deduced from both theories regarding financial leverage, dividend payout, investment and profitability would be outlined in this section.

2.1 Theoretical Literature

There are various theories in the finance literature underlying the capital structure, investment and dividend decision of firms. The foremost among them is the Perfect market model or the irrelevance theorem of Modigliani and Miller (MM proposition I) of 1958 regarding the capital structure of firms.

Modigliani and Miller (MM) argued that the value of a firm is the same under different capital structures. In other words, no capital structure is any better or worse than any other capital structure for the firm's stockholders. They concluded that this is possible in a world where there are no taxes, transaction costs and individuals and corporations borrow at the same rate. MM argued that, if levered firms (firms that use more debt in their capital structure) are highly priced,

rational investors will simply borrow on their personal accounts to buy shares in unlevered firms; thus, firms that use less or no debt in their capital structure. This substitution is often times called homemade leverage. As long as individuals can borrow and lend on the same terms as the firms, they can duplicate corporate leverage on their own. These will cause the value of a levered firm to be the same as the value of an unlevered firm. They added that, the nature of the capital structure of a firm is not important in determining firm's value under perfect market conditions.

Modigliani and Miller (1963) posited a further argument regarding dividend and investment. MM based their argument on the assumption of a world where there are neither taxes nor brokerage fees and no single participant can affect the market (perfect market). In such a market, all individual firms have the same belief concerning their future investments, profits and dividends. They added that firms in this market have their own investment policy ahead of time which cannot be altered by changes in dividend policy. MM contended that, dividend policy does not matter. That is, managers choosing either to raise or lower their current dividend would not affect the current value of their firms. They concluded that firms should undertake all positive Net Present Value (NPV) investment projects even at the expense of dividend payment in a perfect market economy.

These assumptions of MM do not hold in the real world on the grounds that imperfection in the capital market do exist, suggesting that different sources of financing may be relevant to the investment decision of the firm. Dividend decision is also important because it determines the payout received by shareholders and the funds retained by the firm for investment.

Following MM's 1958 and 1963 seminal papers, firm financing patterns have attracted a large number of theoretical and empirical research papers. The most influential theories of capital structure that serves as alternatives to MM are the pecking order theory and the trade-off or target capital theory. In general, these alternatives are based on examining what happens if Modigliani and Miller's assumptions do not hold.

2.2 Pecking Order Theory

The Pecking order theory was first proposed by Donaldson (1961) but did not receive much attention in the finance literature until Myers and Majiluf (1984) took it up and asserted that firms prefer internal equity to external equity. This was later affirmed by Fazzari et al. (1988) that firms prefer internal source of finance over external sources due to transaction cost, agency cost and information asymmetry. These are explained below;

2.2.1 Transaction Cost

Donaldson (1961) claimed that firms decide to follow the 'financing hierarchy' as posited by the Pecking order theory due to transaction cost. According to Zurigat (2009), this transaction cost includes compensation for the dealer placing the issue and other expenses such as legal, accounting and printing cost, registration fees and taxes. Donaldson explains that firms that use internal finance experience less or no transaction cost as compared to the use of external finance. Myers and Majiluf (1984) are of the opposing view that firms rely on internal over external finance not only as a result of the flotation cost involved, but because they want to maximize existing shareholders wealth. Adedeji (1998) explained that sale of new shares is not in the interest of existing shareholders because it will lead to a decrease in the market price of the

existing shares. So firms will rather want to use retained earnings and hybrid of debt before thinking of floating shares.

2.2.2 Asymmetric Information

Pecking Order Theory (POT) explains that firms follow the 'hierarchical' ordering due to the existence of information asymmetry. Management of the firm has more knowledge regarding the investment opportunities and profitability of the firm than investors of the firm, indicating the existence of information asymmetry. Myers and Majluf (1984) posited that information asymmetry would lead to mis-pricing of a firm's equity, which would impact inversely on existing shareholders wealth. Adverse selection problem allows managers to be better informed about their own firm's prospects than outside investors. Thus, when a firm decides to issue new equity to finance new projects, potential investors would interpret that decision to issue new securities as a signal that the firm's prospect as seen by management is bad, coercing investors to price new securities accordingly. This causes the firm's share price to fall leading to underpricing (Kasozi, 2009). These motivate managers to rely on retained earnings or debt to finance new investments. This is because an announcement to issue debt has a smaller impact on stock price than an announcement to issue equity.

2.2.3 Agency Cost

Agency cost is incurred to curtail the conflict between shareholders and management of a corporate firm. This conflict occurs as a result of the moral hazard problems that arise due to the separation between ownership and control [Jensen and Meckling, 1976].

Management would always want to maximize perquisites on the job at the expense of shareholders wealth. Agency cost is used to track the behavior of management. This cost increases the cost of raising external finance, and consequently increases the reliance on internally generated funds as the cheapest source of financing.

Another kind of conflict arises between manager/shareholder and debt holders due to the use of debt, increasing the cost of external funding and consequently shifts firms toward the use of internally generated funds. Firms with higher agency cost would tend to depend more heavily on internally generated funds for financing investment following the POT.

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2.3 Predictions of the POT

Adedeji (1998) concluded that despite the varied explanations to why firms would like to follow the POT, the conclusion that firms relate their profitability and growth opportunities to their long term target dividend payout ratios in order to minimize the need for external finance cannot be ignored. Out of his conclusion the following predictions can be deduced:

1. Profitability has a negative influence on financial leverage because a firm that can generate more earnings would borrow less.

2. A negative interaction between long term dividend payout ratio and investment, since high dividend payout ratio leads to low level of retained earnings which would lead to the need to raise money to finance growth opportunities.

3. No clear-cut prediction can be concluded about the relationship of financial leverage to either dividend payout ratio or investment. The reason is that, the nature of their relationship depends on how firms respond to earnings shortage.

    i.   If firms respond to earnings shortage by borrowing to pay dividend and finance growth opportunities on a cumulative basis, then, the long term value of dividend payout ratio and investment should have a positive influence on financial leverage.

    ii.   Firms can also respond to earnings shortage by borrowing to finance dividend and postpone or reduce investment, due to the reluctance to cut dividends. Therefore, financial leverage may have a positive relationship with dividend payout ratio and a negative relationship with investment.

4. Firms facing financing constraints have a lower chance of issuing new securities or foregoing profitable investments when net cash flows are low. Firms with more volatile cash flows are likely to have lower dividend payouts and less debt in their capital structure.

2.4 Static Trade-Off Theory

The static trade-off model explains that financial leverage and dividend decisions of firms depend on firms weighing their costs and benefits of going for an additional debt. This suggests there is a threshold level of debt at which the firm's value is maximized. The threshold level of debt is generally called the optimal level of capital structure. In determining the optimal level of capital structure, a firm needs to assess the costs of holding debt to the benefits of debt holding. If the costs of holding debt are higher than the benefits, a firm's manager can decide to reduce

the amount of debt use. The costs and benefits associated with reaching the optimal capital structure are described below.

2.4.1 Costs of Debt Use

The costs associated with the use of debt include bankruptcy cost and agency cost. These costs are explained below.

2.4.1.1 Bankruptcy Cost

Bankruptcy is the situation whereby ownership of a firm's assets is legally transferred from the shareholders to the bondholders (Huang et al., 2002). Bankruptcy occurs as a result of a firm being financially distressed and unable to defray its debt over time. This cost is incurred when firms borrow so much and are unable to meet their financial obligation toward their creditors.

It has been showed by Warner (1977), that financial distress has both direct and indirect cost components. The direct cost involves transaction cost of negotiating between debt holders, equity holders and the firm in case of bankruptcy and the cost of reorganization. Indirect bankruptcy costs are defined as expenses or economic losses that result from bankruptcy but are not cash expenses on the process itself (Titman and Wessels, 1988). Examples of such losses caused by bankruptcy are sales that are lost during and after bankruptcy, loss of key employees after the firm becomes bankrupt. Sales can frequently be lost because of fear of impaired service and lost of trust (Huang et al., 2002).

A firm that is trying to maximize the value of its shareholders wealth would choose a debt level that equalizes the marginal cost of debt that result from financial distress costs with the marginal benefit of debt that results from tax benefits. This level of debt use is the optimal level because a firm cannot afford to increase or decrease its debt use at that optimal level.

There is currently very little empirical evidence on the impact of costs associated with financial distress/ bankruptcy (Kasozi, 2009: 25). The fewer researches were also conducted in developed countries. Kasozi (2009) cited the works of Samuels et al. (1997:659), Brealey et al. (1995), Warner (1997) and Altman (1968), that suggested that bankruptcy costs are insignificant when compared with overall market value of the business prior to bankruptcy.

2.4.1.2 Agency Cost of Debt

Huang et al. (2002) explained agency cost as the cost associated with monitoring management's actions to ensure that these actions are consistent with the contractual agreements between management, shareholders and debt holders. Agency cost can be between shareholders and management, bondholders and management or shareholders and bondholders.

Debt worsens the conflict between debt holders and shareholders since the debt contract gives shareholders an incentive to invest sub optimally. Zurigat (2009) cited the work of Jensen and Meckling that examines the agency costs, incentive effects of debt on the investment choices of shareholders and managers. Zurigat asserted that shareholders can extract value from debt holders by over investing the debt fund in risky projects. Shareholders profit from the likelihood of larger gains at the expense of larger potential losses. This leads to a reduction in the value of

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the firm and transfer of wealth from creditors to shareholders. The cost of the incentive to invest in value decreasing or risky projects created by debt benefits the shareholders. This concept is generally known as the asset substitution effect which is an agency cost to debt financing (Kasozi, 2009).

Firms engaging in asset substitution can be deterred by encouraging them to issue secured debt. Kasozi (2009) added that for collaterized debt, the borrower would be restrained or limited to use the funds for a specified project which reduces the agency costs of asset substitution and hence, the costs of debt.

2.4.2 Benefits from Debt Use

The benefits of debt use include tax deductibility of interest income and the reduction of free cash flow agency problem. These benefits are explained below:

2.4.2.1 Tax Deductibility of Interest Income

Firms with debt are expected to deduct their interest income before corporate taxes are computed. As a result of the tax shield nature of debt, firms using more debt decrease their expected tax liability and increase the value of their debt tax shield. Only tax paying firms stand the chance of benefiting from tax shield. Firms incurring losses would not benefit from tax shield. Furthermore, firms that have substantial tax shields from other sources, such as depreciation, would get less benefit from using more debt (Kasozi, 2009). Therefore, tax shield can only be considered in a profitable company.

Taggart (1985) contended that corporate debt enjoys tax shield when corporate tax rates exceed marginal personal tax rates. The government of Ghana taxes a statutory 25% levy as corporate income tax which exceeds the 8% interest income tax (ISSER, 2011). This shows it is more advantageous for most firms in Ghana to use more debt to less debt in determining their optimal capital structure. For UK firms, Adedeji (1998) pointed out that the tax system discourages the use of debt; unlike the classical tax system does in US. For US, firms that sustain losses for a period and are allowed to receive cash refund of prior taxes paid or a tax reduction in the future. This led Zurigat (2009) to conclude that US companies are expected to depend heavily on debt to finance their investment opportunities and make quick target reversion for any leverage deviation from target.

2.4.2.2 Reduction of Free Cash Flow Agency Problem

Jensen and Meckling (1976) showed that debt serves as a mechanism to mitigate the agency cost of shareholders-managers conflicts. The conflict between managers and shareholders will persist if managers continue to use free cash flow on perquisites and overinvesting in managerially rewarding but unprofitable activities. Jensen (1986: 323) defines free cash flow as "cash flow in excess of that required in funding all projects that have positive net present value when discounted at the relevant cost of capital";

This agency problem can be curbed by the use of more debt which will push managers to pay out more of the firm's excess cash to bondholders. By so doing, firms are giving bondholders the

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right to take the firm to the bankruptcy court if they do not adhere to their commitment to pay their interest and principal (Zurigat, 2009).

Lasfer (1995) argues that debt finance motivates managers to work harder and make better investment. This benefit of debt in fighting against the agency cost of free cash flow is usually derived by firms that generate some amount of free cash flow but invests in unprofitable projects. Firms that are facing no such problem do not stand the chance of benefitting.

2.5 Predictions of the Static Trade-Off Theory

The trade-off model, according to Fama and French (2002) predicts that;

1. Firms with more investment have lower dividend payout ratio and less leverage. This indicates a negative interaction between investment and dividend payout ratio, and same negative relation between investment and financial leverage.

2. Controlling for investment opportunities, dividend payout ratio and financial leverage are positively related to profitability.

3. Based on the free cash flow agency benefit, dividends and debts are substitutes. So there is a negative relationship between financial leverage and dividend payout ratio.

2.6 EMPIRICAL LITERATURE

This section examines empirical literature from both developed and developing countries, and the section is climaxed with evidences from Ghana.

2.7 Empirical Evidence from Developed Countries

After the predictions by Myers and Majiluf (1984) regarding the POT, Baskin (1989) was the first to test the POT in terms of its predictions with respect to a number of explanatory variables, such as profitability, financial leverage, firm size, dividend payout, investment…etc. Baskin (1989) looked at the effect of dividend yield and investment on financial leverage and the effects of dividend yield and financial leverage on rate of investment growth in the United States of America. Baskin realised a negative sign of the profitability coefficient in the leverage equation in harmony with the predictions of the pecking order theory. Therefore, the study concluded that the pecking order theory really describes the corporate financing behavior of US firms. Transaction cost, information cost and control considerations are the reasons for US firms following a 'financing hierarchy'.

 A similar study was done by Allen (1993) for Australia. Allen found that there is a positive relationship between financial leverage and investment. The findings of Allen support the predictions of the pecking order theory, where a significant negative relationship between leverage and profitability is found. This relationship is because profitable firms would increase their retained earnings, reducing the firm's possibility of going for debt (implying a reduction in financial leverage). Allen argues that this is the case in Australia due to the presence of

information asymmetry and the resulting market misevaluation of equity. This would motivate firms to avoid equity issuance and turn to debt which is less subject to adverse selection problem. Allen concluded that, his findings are consistent with that of Baskin in US.

The studies by Baskin (1989) and Allen (1993) were not that comprehensive enough, because they both examined the effects of dividend yield and investment on financial leverage, and the effects of dividend yield and financial leverage on corporate investment. Both studies did not look at the effects of financial leverage and investment on dividend payout ratio. Adedeji (1998) concluded that their study did not give sufficient indication as to whether there is a negative interaction between dividend payout ratio and investment.

Adedeji (1998) realizing the pitfall of Baskin (1989) and Allen (1993), investigated the possible interaction among investment, financial leverage and dividend payout ratio in the United Kingdom (UK). Adedeji tested the predictions of the pecking order theory on 224 firms in UK over a period 1993-1996. His results showed that dividend payout ratio has the predicted negative interactions with investment and the expected positive interaction with financial leverage. The results did not show any significant interaction between financial leverage and investment. The study further showed investment as having a positive influence on financial leverage but financial leverage not having any significant influence on investment. Adedeji concluded that there is no clear-cut relation about the impact of financial leverage on either dividend payout ratio or corporate investment. The nature of their relationship depends on how firms respond to their earnings shortage. That is why this study seeks to find out the nature of that relationship among listed Ghanaian firms.

Fama and French (2002) examined the target leverage, mean reversion of leverage and the short term response of dividends and debt to variation in earnings in annual samples that covered the 1965-1999 periods for more than 3000 firms in UK. Fama and French found out that there is a negative relation between financial leverage and the target dividend payout ratio in conformity with the predictions of the trade-off and pecking order models. Their study controlled for investment opportunities, and realized a negative relationship between profitability and financial leverage in support of the POT against the trade-off model. Fama and French concluded that financial leverage increases if investments exceed retained earnings and falls when investments are less than retained earnings.

Rajan and Zingales (1995) tried to find out whether factors influencing the capital structure of firms in the United States of America are similar to that of other developed countries. They used as determinants market to book ratio, tangible assets, profitability and firm size for the sampled countries. Their findings indicated that market to book ratio and profitability are negatively related to financial leverage. However, Rajan and Zingales concluded that the negative relation between market-to-book ratio and leverage appeared to be driven by firms with high market-to-book ratios than firms with low market to book ratios. This conclusion by Rajan and Zingales could be better explained if firm size was added to the leverage equation. They compared their results to that of the G-7 countries apart from US and found that, the results were similar. This implies that, the capital structures of firms in developed countries are influenced by similar factors. Let us now consider evidences from developing countries.

2.8 Developing Countries

Using data from 100 largest listed firms from 10 developed countries (Brazil, India, Jordan, Malaysia, Mexico, Pakistan, South Korea, Thailand, Turkey and Zimbabwe); Singh (1995) concluded that large firms in developing countries have their capital structure influenced by equity timing considerations and the cost of debt during the period 1980-1990. His findings indicated that, these firms rely heavily on external funds than internal funds. He added that firms rely on equity than debt and the reason for this relation is due to the fall in the relative cost of equity capital during the 1980's, with a corresponding large increase in stock prices. During that same period, there was an increase in the cost of debt that led to equity issues becoming relatively more attractive for financing corporate investment. He added that this is the case for only the large firms in the sampled countries and might not necessarily be the case for smaller firms.

Cobham and Subramaniam (1998) used a sample of large firms to determine whether the firms use external and equity sources of finance in India as postulated by Singh (1995). They found an opposing view, indicating that large firms in India use more internal sources of finance than external sources. Cobham and Subramaniam (1998) concluded that large Indian firms exhibit similar debt ratios to that of Britain. This shows how contentious research findings in transitional and developing countries are. Most transitional countries do not have accurate and consistent data and that accounts for some of these discrepancies.

Booth et al. (2001) used a sample of firms from 10 developing countries to assess whether there are similarities in the determinants of the capital structure of firms across those countries. The

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sampled firms in their study were from Brazil, India, Jordan, Korea, Malaysia, Mexico, Pakistan, Thailand, Turkey and Zimbabwe. Booth et al (2001) used three measures of debt ratio; total debt ratio, long term debt ratio and long term market debt ratio. The other explanatory variables in the study were average tax rate, asset tangibility, business risk, size, profitability and the market to book ratio. In their findings, they realised a negative relation between profitability and financial leverage in harmony with pecking order predictions. Booth et al. (2001) showed that debt ratios in developing countries are affected by similar factors as that of developed countries. They concluded that long-term debt ratios of developing countries are lower than those of developed countries.

Adelegan (2002) extends the study by Adedeji (1998) by testing the predictions of pecking order theory. The study focused on the interrelationship between financial leverage, investment and dividend payout ratio for quoted firms in Nigeria. Adelegan (2002) segregated 63 sampled firms into small and large firms, to test whether the size of the firm influences the relationship between financial leverage, dividend payout ratio and investment of corporate firms in Nigeria. The results from Adelegan (2002) showed that dividend payout ratio has the predicted positive interaction with financial leverage and weak negative interaction with investment. No significant interaction was found between financial leverage and investment.

However, Booth et al., (2001) stated that debt ratios in developing countries vary from one country to the other, due to that this study will find out whether there is any interrelationship between financial leverage, dividend payout ratio and corporate investment providing evidence from Ghana.

2.9 Empirical Evidence from Ghana

Achakoma (2005) investigated the determinants of the capital structure of listed firms in Ghana. The study used an unbalanced panel data set from 1993 to 2003 comprising 23 listed companies. Achakoma (2005) realised that Ghanaian firms are, on average, highly leveraged and short-term debt comprising a major part of Ghanaian firm's total debt. His finding from the random effect specification supports the trade off theory of capital structure. The results indicated that asset tangibility, profitability and growth are relevant determinants of Ghanaian firm's capital structure.

Using data from 19 listed firms on the GSE, Domfe (2007) tried to look at the impact of interest rates reduction on the financing strategy of publicly quoted firms in Ghana since 1995 to 2005. Domfe used the financial reports of the firms to find the impact of interest rate on firm financing decisions. Domfe realised either directly or indirectly that a reduction in interest rates, leads to debt financing becoming cheaper and more attractive than any other source of finance.

Abor (2008) examined the capital structure of publicly quoted firms, large unquoted firms, and small and medium enterprises (SMEs) in Ghana. Using a panel regression model, the study examined the determinants of capital structure decisions among the three sampled groups. The findings of his study showed that quoted and large unquoted firms exhibit higher debt ratios than SMEs. Abor (2008) further showed that quoted and large unquoted firms portray no significant difference in their capital structure. The study realised that short term debt constitutes a greater proportion of total debt of Ghanaian firms.

The results by Abor (2008) proved that firm size has a positive relationship with short-term debt ratios of SMEs and debt ratios of quoted firms. Growth of a firm was also found to have a positive relationship with financial leverage. His study supported the pecking order theory by proving a negative relation between debt/ financial leverage and profitability in all sampled groups.

Using ARIMA models, Bokpin and Isshaq (2008) looked at the impact of stock market development on the financing choices of listed firms in Ghana, using data covering the period 1991 to 2005.Their study regressed debt-equity ratios on the measures of market size and market liquidity variables. Bokpin and Isshaq (2008) concluded that stock market development in Ghana has not led to the substitution of equity for debt, which is contrary to the findings of prior studies in other countries. Their findings showed a significantly negative relation between short-term debt and market size variables. The study showed an insignificantly positive relation between short-term debt and the market liquidity variables.

Andani (2008) examined the financing decisions of 19 listed firms in comparison with 16 non listed companies in Ghana for the period 2000-2006 using panel econometric model. The study found support for the pecking order theory which predicts a negative relationship between profitability and debt ratio/financial leverage for all the firms (listed and non-listed). The free cash flows hypothesis finds support in the long-term debt decisions across firms, listed and non-listed but not in the capital structure decisions.

Using a panel data model of 16 sampled firms from the GSE, Anfom (2008) examined the relation existing between the capital structure and investment decisions of firms. The study found that an increase in cash flows results in a rise in corporate investment, profitability and liquidity. The study showed that external financing is the most important source of financing in Ghana. Anfom (2008) realised that firms with large number of tangible assets have more debts in their capital structures. The study turns to support the pecking order theory because it shows a negative relation between financial leverage and profitability.

All the studies above conducted on the Ghanaian stock exchange suffer from sample selection problem because they use smaller sample sizes and set as proxy debt equity ratio for financial leverage. This study departs by using total debt to total market value of the firm as proxy for financial leverage and uses almost all the listed firms on the Ghanaian Stock Exchange (GSE) for the period 2004-2009, except one that was delisted before 2009.

Using structured questionnaire, Osei-Assibey (2010) collected data on 176 microenterprises in Ashanti Region of Ghana. He showed that microenterprise firms in Ghana are faced with external financing constraint due to a number of factors. Some firms believe their collateral positions do not match up to what is required to access external debt. Others have the perception that, the cost of borrowing (interest rate) is too high for them to pay, which is not the case. Osei-Assibey added that some firms refuse to apply for loans due to the time involved in filling complex application forms which they see as tiresome and boring. These constraints motivate most firms in Ghana to rely heavily on internal funds over external funds. The study by Osei-Assibey is on non listed microenterprises, but predictions of the pecking order theory apply

basically to corporate firms that can raise equity sources of finance. This implies the study cannot best provide much evidence to support the pecking order theory.

The most current study is by Amakye (2011) that investigated the determinants of the key sources of external financing of working capital and new fixed investments by firms in Ghana. Amakye (2011) used the World Bank Enterprise Survey (WBES) on Ghana, a firm level survey conducted in 2007. He Used a Tobit estimation technique that found support for the POT that Ghanaian firms rely more on internal sources of finance than external sources.

In the use of external sources of financing working capital, trade credit is more important than bank financing (Amakye, 2011). Amakye (2011) explained that firms finance a higher proportion of their new fixed investments from banks as compared to other sources of financing. The study showed factors that influence the use of external sources of financing, such as firm size, audited financial statements, sectors, educational level of the manager, ownership and location.

Capital structure is an area in the finance literature that has been highly researched, but most of the researches done in Ghana are not that comprehensive, no research was found that tried to look at the interrelationship existing between financial leverage, dividend payout ratio and investment among listed Ghanaian firms. Most of the researches done in this area are in developed countries, only are handful are in developing countries. There is the need for 'triangulation' in the finance literature in developing countries such as Ghana.

This study investigates whether the predictions of the POT explain dividend payout ratio in Ghana. This thesis follows the study by Adedeji (1998) and Adelegan (2002), to test the interaction between dividend payout ratio, financial leverage and investment among Ghanaian firms. The study differs from the study conducted by Adedeji (1998) and Adelegan (2002) in terms of the scope and content of the study. The study by Adedeji (1998) and Adelegan (2002) were carried out using data from UK and Nigerian firms. Due to contextual and institutional differences, we carry out this study using data from Ghana. In addition, the equations in the model are specified in this study to suit the situation of corporate firms in Ghana.

CHAPTER THREE

PERFORMANCE OF THE GHANAIAN STOCK EXCHANGE

3.1. Historical Background (Pre-establishment Era)

The notion to establish a stock exchange in Ghana started way back in the 1960's. These can be seen in the 1969 Pearl report by Commonwealth Finance company Limited, recommending the establishment of a stock exchange in Ghana within two years. The report further suggested ways of achieving that goal. Since then, various governments down the line have always established committees to explore ways of bringing into being a stock exchange in the country. Most of these governments expected that, the development of an exchange in Ghana would enhance economic growth by increasing the quality and quantity of investment in Ghana.

Various efforts by governments to establish a stock exchange led to the enactment of the Stock Exchange Act of 1971, in Ghana. It was in that same year the Accra Stock Exchange was incorporated but remained non-functional. The main reason was that, at that time, the country was facing both macroeconomic and political instability inhibiting the progress of the exchange.

The investment Policy Decree was promulgated in 1975, in an attempt to sensitize Ghanaians on Equity investment (Domfe, 2007). The Decree required all foreign firms in Ghana to divest not less than 40% of their equity capital to Ghanaian locals. In 1976, the Trust Holding Company Limited (THC Ltd) was established and was later joined by Merban Stockbrokers Ltd. to provide brokerage services to the investing public by selling, buying and managing equity stocks in the

absence of a recognized stock market, yet the idea of establishing a formalized stock exchange was a fiasco (Domfe, 2007).

3.2 Inception of Ghana Stock Exchange (GSE)

The idea of establishing a stock exchange remained on the drawing board for almost two decades before its implementation. During February 1989, the goal of establishing a stock exchange moved a higher gear. The then government established a ten-man committee under the chairmanship of Dr. G.K Agama, the then governor of the Bank of Ghana to see to it that the stock exchange comes to its full realization. The work of the committee was to consolidate all previous work connected to the exchange project and to fashion out modalities towards the actual establishment of the exchange.

In July 1989, the stock exchange was established as a private company limited by guarantee under the Companies code of 1963. It was given recognition as an authorized stock exchange under the Stock Exchange Act of 1971, (Act 384) in October 1990 and became the fifth stock exchange to be established in Africa. The council of the exchange was inaugurated on November 12, 1990 and trading commenced on its floor that same day. In April 1994, the exchange changed its status to a public company limited by guarantee.

The stock exchange was established with various objectives which included the following;

- To provide the necessary facilities and framework to the public for the purchase and sales of bonds, shares and other securities.

- To control the granting of quotations on the securities market in respect of bonds, shares and other securities of any company, corporation, government, municipality, local authority or other corporate body.

- To regulate the dealings of members with their clients and other members.

- To coordinate the stock dealing activities of members and facilitate the exchange of information including prices of securities listed for the mutual advantages and for the benefits of their clients.

- To cooperate with associations of Stockbrokers and stock exchanges in other countries and to obtain and make available to members information and facilities likely to be useful to them or to their clients.

The exchange was opened for trading with 11 securities all of which were equities. It first witnessed listing of a corporate bond in 1996. The government of Ghana bonds was first introduced on the exchange in 2001, when the number of equities had risen to 22 (Haligah, 2004).

Since the establishment of the Ghana Stock Exchange (GSE), it has achieved several successes. In 1993, it was ranked the sixth best index performing emerging stock market with a capital appreciation of 113.74%. The GSE became the best index performing stock exchange among all the emerging markets in 1994 gaining 124.34% in its index level. In 1998, the Standard Chartered Bank London Limited voted the exchange as the best performer among all stock markets in Africa in terms of capital appreciation (Domfe, 2007).

Currently, the listing of AngloGold Ashanti (AGA) on the London Stock Exchange and on the Johannesberg Stock Exchange, together with the listing of the Trust Bank Limited (The Gambia) and Ecobank Transnational Incorporated (ETI) gives the exchange an international appeal and structure.

The performance of the GSE over the past few decades has not been the best. Most often, the bad performing periods are as a result of unstable macroeconomic conditions in the country. The study tends to segregate the period into three groups for easy analysis.

The period 1990-2001, is the introductory period in this study. This is because 1990 was the time the GSE started operation. In addition, government bonds were first introduced on the exchange in 2001 deeming the period 1990-2001 fit to be called the introductory period. The second period spans from 2001 to 2005, which is known in this study as the period of trough. From Fig 3.4, the graph exhibits the shape of a trough for the period 2001-2005. The GSE market returns for 2001 stood at 11%, 46% in 2002, 155% in 2003 and began reducing to 91% in 2004 and finally to -30% in 2005 qualifying the period to be known as the period of trough. Finally, 2008-2011 is the cyclical period. During that period, the GSE market returns showed an up and down movement. Fig 3.4 demonstrates that, the GSE market returns was 28% for 2008, it fell drastically to -47% in 2009, picked up to 32% in 2010 and finally to -3% in 2011.

3.3 Performance of the Ghanaian Stock Exchange for the Period 1990-2001 (Introductory Period)

The growth of the GSE during the introductory period had not been impressive. During the first 22 years after its establishment (1989-2001), only 22 firms were listed on the exchange. There had been several years where no new listings were done. For instance, from 1997 to 1998, there were no new listings on the exchange. The historical average shows 1.3 new listings per year. The poor performance during the introductory period is understandable; this is because for the period 1990-2000, the economy faced difficulties due to high levels of inflation, rapid depreciation of the cedi, high interest rates eroded investor interest in the market. This can be observed from the performance of the stock market as depicted in the figure below. The figure measures the market capitalisation to GDP ratio for the period 1994 to 2001.

FIG 3.1 GSE market cap/ GDP
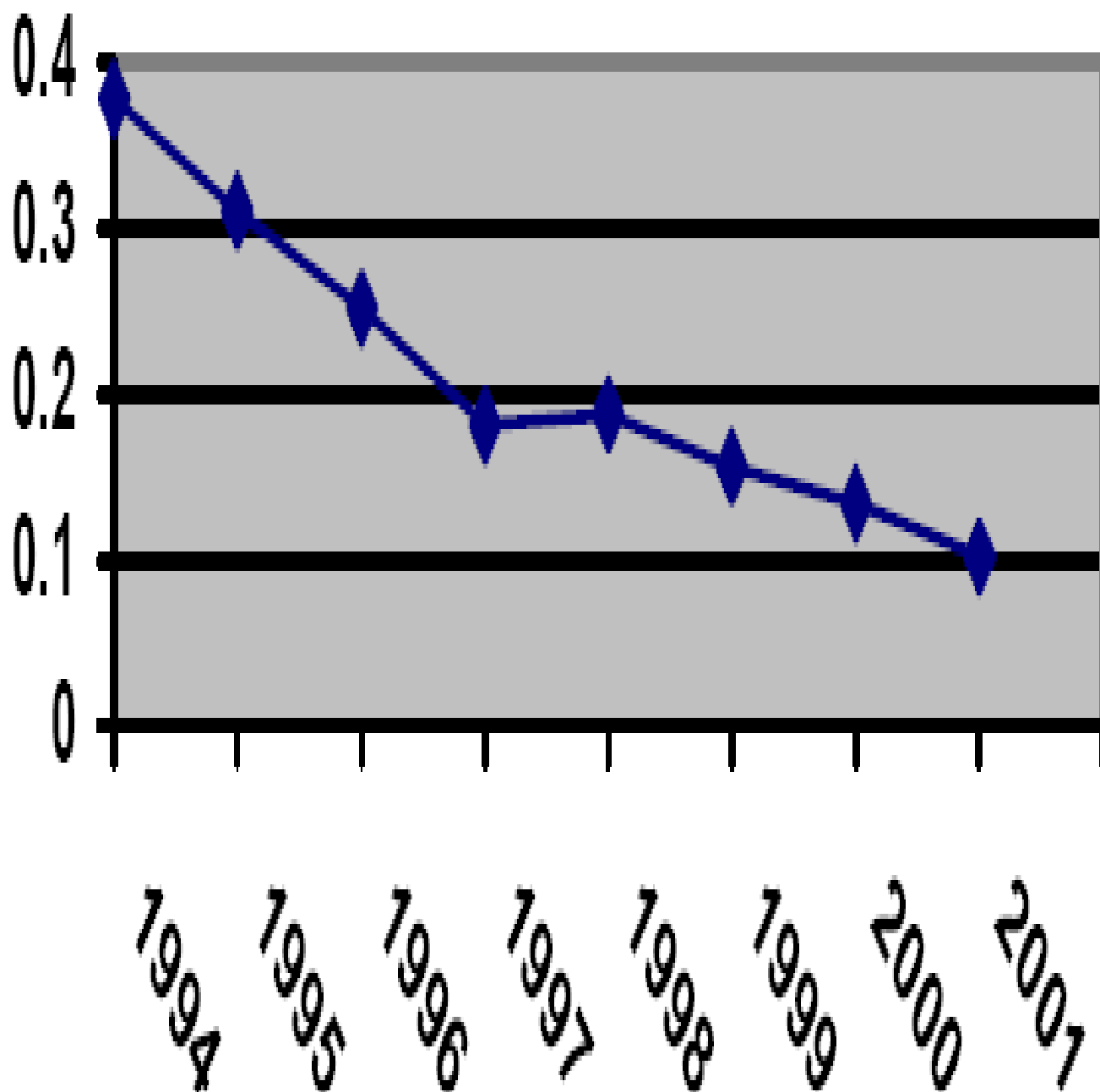
SOURCE: FINSSP (2003), P.29

Fig 3.2 GSE trading volumes from 1990 to 2001
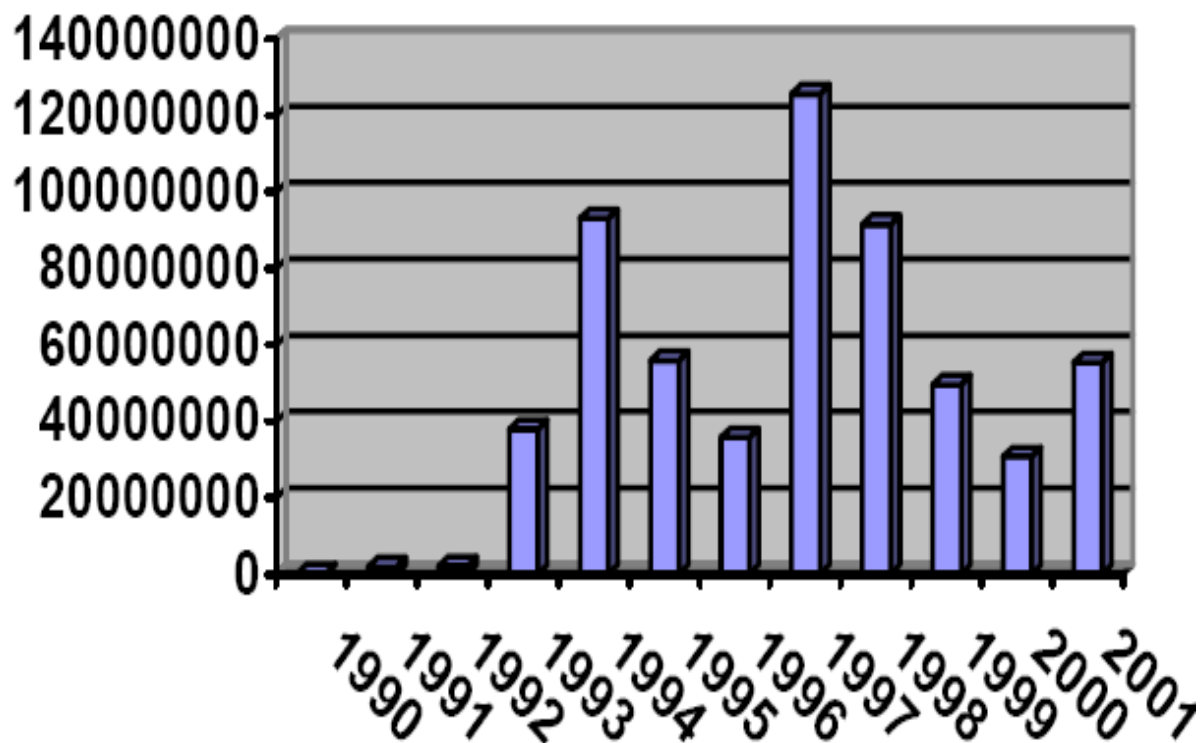
SOURCE: FINSSP (2003), P.29

The above graphs showed that the performance of the stock market had not kept up with the growth of the economy. Market capitalisation to GDP dropped steadily from 0.39 in 1994 to 0.1 in 2001 (Fig 3.1). From fig 3.2, trading volumes also dropped to about one-half of the levels attained in 1996. In 2001, market turnover [2] was as low as 2.6% compared to 9.3%, 17.5% and 29.4% for Mauritius, Malaysia and Zimbabwe respectively.

FINSSP (2003) document indicated that due to the poor performance of the GSE, investor confidence has been eroded because of low returns (Fig 3.3). From 1991 to 2001, the annual

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[2] Market turnover was measured as the ratio of value traded to market capitalisation

returns on the GSE have outperformed inflation and Treasury bill rates only thrice (FINSSP, 2003). This is shown below;

FIG 3.3 Market returns, inflation and 91-day Treasury bill
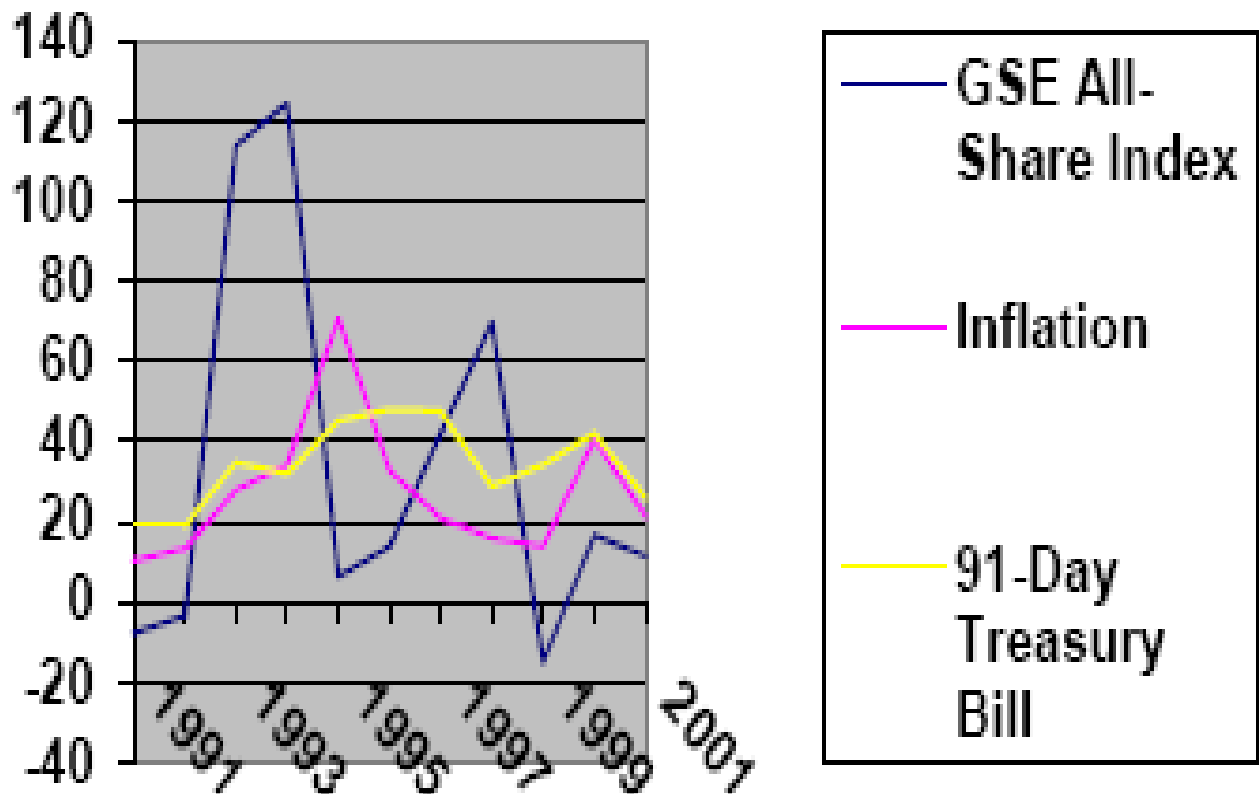
Source: FINSSP (2003), P. 30

3.4 Performance of the GSE for the Period 2001-2005 (Period of Trough)

Irrespective of the various challenges faced by the GSE during the introductory period, the GSE All-Share Index managed a 16.55 nominal rise with much higher turnover in 2001. The year 2001 experienced a relatively stable economic environment which led to a progressive impact on the performance of the stock markets. It was in the same year the prices of most listed equities went up, the GSE All-share Index increased by 11.42%. Market capitalisation for equities went up by 6.81% to close December 2001 at ¢3,904.03 billion. Turnover in equities almost doubled at the rate of 2.4% against 1.3% for 2000 (Domfe, 2007).

After 2001, inflation and interest rates in Ghana began to dwindle and the exchange rate of the cedi became fairly stable. The capital market became bullish because many investors made profit from 2002 to 2004. Investors were able to make profit for only 3 years followed by a bearish run in 2005. The GSE All-share index began to decline from 6798.59 at the end of 2004 to 4769.02 at the end of December 2005. This represents a negative change of 29.85% against a background of gains in the index of 45% in 2002, 154% in 2003 and 91% in 2004 (Domfe, 2007, GSE facts book, 2006). The performance for the period can be seen from the table below;

Table 3.1 Market statistics of GSE

YEAR	1991	1992	2004	2005
NUMBER OF LISTED FIRMS	13	15	30	29
TOTAL MARKET CAPITALISATION ¢ BILLION	29.62	43.75	97,614.82	91,857.28
NUMBER OF TRADING DAYS	102	99	154	194
VOLUMES OF EQUITY TRADED(MILLIONS)	0.11	0.17	655.90	464.36
GSE ALL-SHARE INDEX	64.51	62.17	6,798.59	4,769.02
PERCENTAGE CHANGE FOR YEAR (%)	-16.92	-3.63	91.33	-29.85

Source: Domfe, 2007

3.5 Performance of the GSE for the Period 2008-2011 (Cyclical Period)

The GSE did not perform well in 2009 as a result of various macroeconomic problems within the period. There was a rebound in the performance of the Ghanaian stock market in the year after, 2010. Volumes and value traded were on the upside on the back of increase investor activity as well as significant corporate actions in most equities. Price activity in 2010 was impressive with most large and mid capitalized stocks rising upwards contrary to their abysmal performance in previous years.

The good performance of the exchange in 2010 was due to favorable macroeconomic conditions existing in the economy. Inflation rates which trended high at the peak of 20.74% in June 2009

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had consistently dropped to as low as 10.68% as at May 2010. The cedi was relatively stable against the major currencies compared to a depreciation rate of 19.90%, 37.47%, 20.87% and 15.01% of the cedi against the US Dollar (USD), British Pounds (GBP), EURO and the Japanese Yen (JPY) respectively in 2009. The Cedi had within the first half of 2010 recorded a value appreciation of 0.60% against the USD, 7.20% against the GBP, 15.78% against the EURO and -0.55% against the JPY (FirstBanc, 2010).

There was a tremendous index performance in 2010. The GSE Composite Index (GSE-CI) and the Financial Stocks Index (GSE- FSI) together witnessed significant appreciation in 2010. As at the end of 2010, the GSE-CI had returned 18.28% compared to -48.01% in 2009. The FSI also gained 249.49 points to close half year 2010 at 790.89 points. This culminated in a change of 31.55% compared to -30.48% in the first half of 2001. Total market capitalisation as at the end of 2010 was GH¢ 18,239.68 million. This was fueled by additional equity listings in stocks of most listed firms.

Following a tremendous performance of the stock exchange in 2010 saw a bearish run[3] in 2011. The stock market performed woefully in 2011. The country saw a fairly stable macroeconomic condition, yet the GSE did not fare any better. This threatened the viability of the stock exchange. The poor performance of the stock market in 2011 can be seen in the stock market returns and the GSE All-share index in the table (3.2) and figure (3.4) below

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[3] A bearish run in the stock market is the period where stock prices begin to fall

	GSE Return		DATE	INDEX
Table 3.2 The GSE returns and Index				
	GSE Return		<u>**DATE**</u>	<u>**INDEX**</u>
1990	-29.75%		28-Dec-90	70.25
1991	-8.18%		30-Dec-91	64.51
1992	-3.62%		29-Dec-92	62.17
1993	113.73%		30-Dec-93	132.88
1994	124.35%		30-Dec-94	298.10
1995	6.33%		29-Dec-95	316.97
1996	13.82%		30-Dec-96	360.76
1997	41.85%		31-Dec-97	511.74
1998	69.69%		30-Dec-98	868.35
1999	-15.22%		29-Dec-99	736.16
2000	16.55%		29-Dec-00	857.98
2001	11.42%		31-Dec-01	955.95
2002	45.96%		30-Dec-	1,395.31
2003	154.67%		31-Dec-03	3,553.42
2004	91.33%	GSE ALL SHARE INDEX	31-Dec-04	6,798.60
2005	-29.72%		30-Dec-05	4,778.07
2006	5.21%		29-Dec-06	5,026.80
2007	31.21%		31-Dec-07	6,595.63
2008	58.16%		31-Dec-08	10,431.64

2009	-46.58%		31-Dec-09	5,572.34
2010	32.25%		31-Dec-10	7,369.21
2011	-3.10%		30-Dec-11	969.03

Source: Ghana Stock Exchange (Annual Reports Ghana)
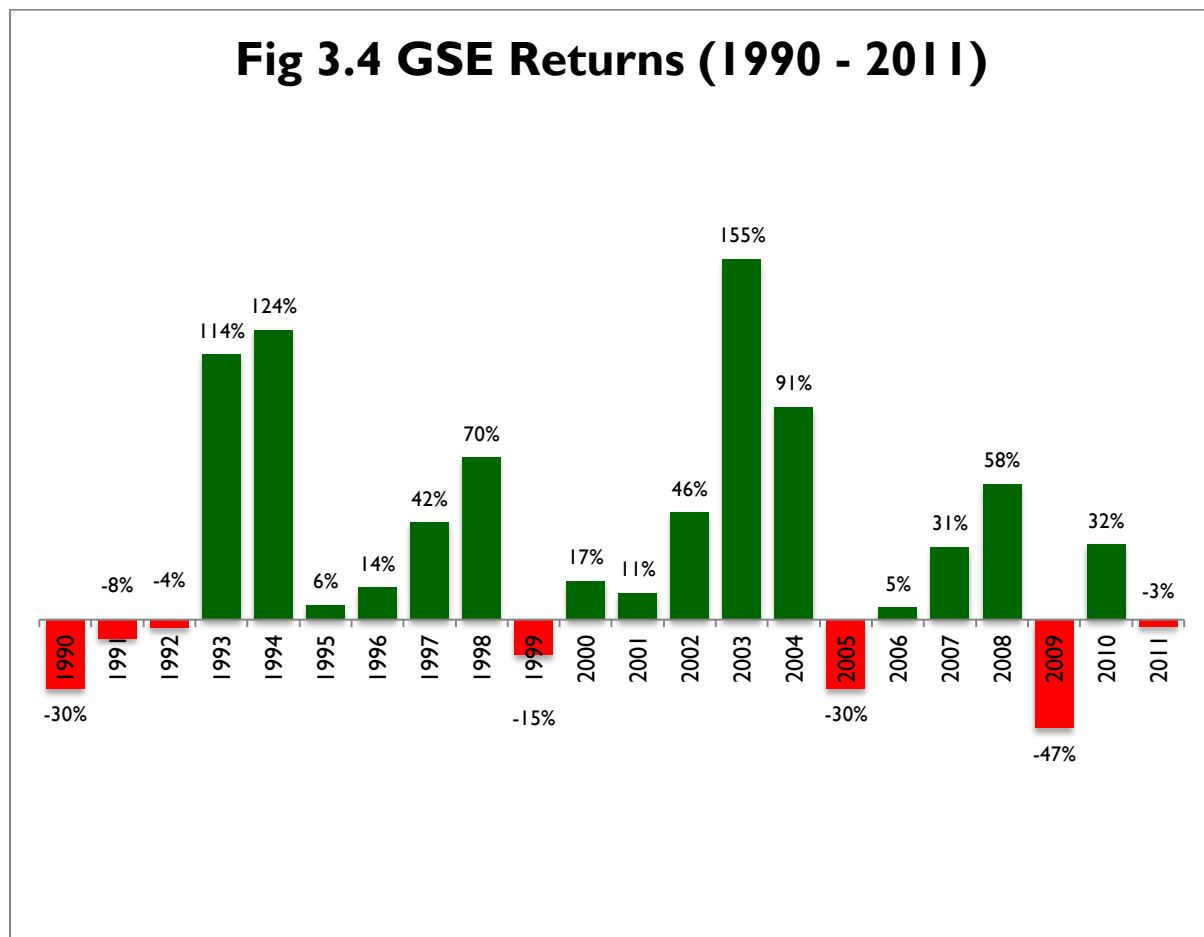
Source: Ghana Stock Exchange (Annual reports Ghana)

Figure 3.4 showed that the market returns fell from 32% in 2010 to as low as -3% in 2011. The GSE All-Share Index fell from 10,431.64 in 2008 to a low of 969.03 in 2011. Since the country

saw a stable macroeconomic environment in 2011, what might be the probable cause of this poor performance?

The number of listed firms on the stock market is woefully inadequate. According to FINSSP (2003), the GSE needs to increase its listings to 50 to make the stock market viable. Currently there are only 34 listed firms following the delisting of some firms at the end of 2011. The GSE had made concerted efforts to increase its listings by introducing a second type of listing called the second list. This list was aimed at encouraging small and medium sized enterprises (SMEs) to list. This effort is proving futile due to the public being unaware of this arrangement. There is the need to create awareness through advertisement to sensitise the public to list their firms. If more research is done on the stock exchange and published, it would enhance the knowledge base of investors about the Ghanaian capital market. That is why this study seeks to add to the few researches done on the stock exchange, by looking at the interrelationship between financial leverage, dividend payout ratio and investment for listed firms.

The Securities Industry Law (SIL) lags behind developments in the capital market in Ghana. For instance, the SIL does not allow trading of derivatives directly and short selling; in finance, short selling is the practice of selling securities that have been borrowed from a third party (usually a broker) with the intention of buying that asset back at a later date to return to the third party. The intention is to sell the asset at a higher price today and hope the price will fall in the future, so he can buy it cheaply for the owner and make profit (Wikipedia dictionary). Derivatives can only be brought under the law only if the Ministry of Finance declares them by notice. The Mutual Fund and Unit Trust Regulations do not allow investment in futures contract by a mutual fund or unit

trust, these regulations do not reflect modern market practice. The Johannesberg Stock Exchange (JSE) expanded their capital market activities by engaging in various types of derivative, which included agricultural products. This had a positive impact on both their capital market and their economy as a whole.

The agricultural sector is one of the most important sectors of the Ghanaian economy. Majority of the population is in the agricultural sector. If the GSE begin trading in commodity futures contract like agricultural products, it would help farmers hedge against various risks and would attract most Ghanaians into the sector. This would help expand the GSE and help create more jobs and thereby reducing the unemployment pressure on the government, leading to increase productivity and hence, economic growth and development in Ghana.

Finally, due to high floatation cost, small scale firms have the disincentive to list. There is the need for the Securities and Exchange Commission (SEC) to review the floatation cost in order to attract medium and small scale firms to list. If this and many other policies are put in place, it would promote new listings, increase market capitalisation and stock returns for the GSE.

CHAPTER FOUR

METHODOLOGY

4.1 Theoretical Model

The pecking order hypothesis predicts that if a firm pays high dividend in one period then it is expected that the firm's internal funds would reduce for investment in subsequent periods. This implies there would be a negative interaction between investment and dividend payout ratio. When firms are faced with earnings shortage and respond by increasing debt (representing an increase in financial leverage) to pay dividends and defer investment, then we expect a positive relationship between financial leverage and dividend payout ratio, and a negative relation between financial leverage and investment.

On the other hand, if a firm makes high investment in one period, this might lead to a reduction in available funds to pay dividends in the next period. Since most firms may not want to change their dividend policy due to the agency problem between managers and shareholders, firms can decide to borrow, thus, increasing their financial leverage or can decide to use equity which is a reduction in leverage to pay dividends.

Firms that have large debt values in their capital structure put pressure on their liquidity. This is because the firm would have to pay both the principal and interest. Funds available might be used to retire debt leading to a reduction in the firm's ability to pay dividends and reduce the funds available for carrying out positive net present value projects.

One of the main objectives of this study is to determine whether financial leverage, dividend payout ratio and investment are interrelated. If so, financial leverage should be a function of dividend payout ratio and investment, after providing controls for other variables. Dividend payout ratio should be a function of financial leverage and investment, including the control variables and investment should be a function of financial leverage and investment, after providing controls for the other determinants investment (Adedeji, 1998).

Due to these predictions of the pecking order theory, the study uses the procedure by Adedeji (1998) and Adelegan (2002) to determine the interrelationship between investment, dividend payout ratio and financial leverage.

These gave rise to the following underlisted system of equations;

DV = D (FINLEV, INVEST, OTHERDV)   (1)

FINLEV = F (DV, INVEST, OTHERFINLEV)   (2)

INVEST= I (DV, FINLEV, OTHERINVEST)   (3)

In the system of equations above, DV, FINLEV and INVESTS stands for dividend payout ratio, financial leverage and investment respectively.

The variable OTHERDV in the first equation represents other variables or determinants that influence dividend payout ratio. These variables were selected based on prior studies in this area. The study by Marfo-Yiadom and Agyei (2011) found out that dividend payout is greatly engineered by profitability of the firm (PR), variability in earnings which is represented in this

study as risk (RISK), corporate tax (TX), and liquidity or cash flow (CF) are significant determinants of dividend payout ratio in Ghana. Size of a firm has also been found as one of the determinants of dividend payout ratio in Ghana (Abor, 2008).

Marfo-Yiadom and Agyei (2011) postulated that more profitable firms have a higher probability to pay dividend than less profitable firms. The Board of Directors of most firms recommends the payment of dividend when the firm makes sufficient profit, in order to prevent management from using the excess cash on perquisites. Hence, it is expected that profitability would have the expected positive relationship with dividend payout ratio. The study by Pruit and Gitman (1991) showed that variability of earnings or risk is a very important determinant of dividend policy. Firms that have stable earnings are often able to predict their future earnings and be willing to pay higher dividends than for firms with fluctuating earnings. The a priori sign of risk or variability of earnings is to have a negative relation with dividend payout ratio.

Corporate income tax is expected to have a negative influence on dividend payout ratio. If the tax rate of the country is increased, 'all things being equal' this would in turn reduce the amount of distributable earnings left to be paid out as dividends, leading to a negative influence of tax on dividend payout ratio. Amidu and Abor (2006) explained that firms with higher cash flows or liquidity are more willing to pay dividend than companies with poor liquidity positions. Firms with high amount of idle cash with management are more likely to pay some out as dividends in other to reduce the shareholders and managers agency problem. Therefore an increase in cash flow would lead to an increase in dividend payout ratio. So a positive relationship is expected between cash flow and dividend payout ratio.

Abor (2008) asserted that the size of a firm has a positive impact on dividend payout. Larger firms have more valuable assets and higher reputation that could help them to cheaply access loan. This would reduce the pressure on the firm to rely heavily on retained earnings, making funds available to pay dividends. Therefore, a positive relationship is expected between size of a firm and dividend payout ratio. Adedeji (2008) included in his study an industry average dividend yield (INDDY) which is included in this study to test whether firms target their average dividend yield when making dividend decisions. If firms do, then the variable is expected to have a positive influence on dividend payout ratio in Ghana.

OTHERFINLEV in equation two represents other variables that influence financial leverage. Bokpin and Anastacia (2009) found out that size (SZ) of the firm, asset tangibility which in this study, we would use structure of firms (STR) for easy comparism to previous studies, profitability (PR), tax (TX), and variability in earnings or risk (RISK) greatly influence financial leverage in Ghana. Adedeji (2008) found out that the industry average debt ratio (INDFL) also influences financial leverage because firms with below average debt ratios are likely to easily raise more debt.

Prior studies have found out that size (SZ) is included in the determinants of financial leverage because larger firms can easily access loans than smaller firms. Large firms have better reputations and incur lower information cost in the debt market. Larger firms have other sources of income, for instance, they can buy on credit due to their reputation but smaller firms might not be granted credit due to fear of it winding up or disappearing into thin air. As a result, larger

firms would like to buy on credit than to go for loan, whereas smaller firms would want to go for bank loans to finance their activities. These makes larger firms use less debt in their capital structure. Therefore, it is expected that size of a firm should be negatively related to financial leverage. Anfom (2008) suggested that firms with assets that had high collateralised value would be able to raise debt more easily, that made the inclusion of structure of assets in the financial leverage equation more appropriate. It is expected that structure of assets would have a positive influence on financial leverage. The more tangible and collateralised assets a firm has, the higher the likelihood of leverage.

Profitability is added to the financial leverage equation since highly profitable firms are more likely to use retained earnings than the use of debt, which would reduce financial leverage. Highly profitable firms can easily pay off their debt leading to a reduction in financial leverage (Anfom, 2008). The a prior sign shows a negative relation between profitability and financial leverage. Abor (2008) showed that the effect of tax on financial leverage depended on changes in the marginal tax rate for any given firm. He added that firms with zero corporate tax rates and a high tax shield would use less debt. Abor explained that, this happens because tax shields lower the effectiveness of marginal tax rates on interest deduction. He concluded that, taxes do affect financial leverage but the magnitude might not be large. It is expected that corporate tax would have a positive influence on financial leverage, because of the tax shield advantage of debt, the higher the tax shield the higher the debt a firm would like to hold. This means that an increase in corporate tax rate would lead to an increase in the use of debt in other to evade the higher burden of tax. This is because interests on debt are deducted before taxes are calculated.

Abor (2008) explained that firms with very high volatility in their earnings would experience situations where cash flows might be too low to service their debt. On the other hand firms with high degree of business risk have less capacity to sustain financial risks; this might lead to the use of less debt in their capital structure. Most studies have indicated that there is an inverse relationship between risk and financial leverage (Titman and Wessels, 1988). Other studies suggested a positive relationship between them (Jordan et al., 1998). Most of these results were based on studies in developed countries. The study by Adelegan (2002) showed that Nigerian firms exhibit a negative impact of variability in earnings on financial leverage, meaning Nigerian firms with unstable earnings have less debt in their capital structure, may be for fear that they would not be able to service their debt. Since the economic and financial structures of Nigeria are similar to that of Ghana because they are all developing countries, we expect a similar result in Ghana.

In equation three OTHERINV represents other variables that affect Investment. Using accounting and market data from 34 emerging markets, over a 15-year period, Bokpin and Onumah (2009) found out that corporate investment in emerging markets are influenced greatly by profitability (PR), sales growth (GRO), size of the firm (SZ) and q ratio (q).

Bokpin and Onumah (2009) found that profitability of a firm exhibits a negative relationship with investment in such countries. They explained that profitable firms in developing countries invest less in fixed assets, hence a negative relation between profitability and investment. In their study, firm size is showed to have a negative relation with investment. The reason is that larger firms invest less in fixed assets.

Both q ratio and sales growth of the firm had been showed to have a positive impact on investment (Bokpin and Onumah, 2009). Firms would increase their investment level if market price per share rises, leading to an increase in available funds for investment. It would also open the way for firms to exploit growth options available to them.

Several other variables used in prior studies in estimating the various equations which includes overseas profit, specialization ratio, irrecoverable advanced corporation tax, research and development and deferred tax were not included due to unavailability of data on those variables.

4.2 MODEL SPECIFICATION

From the theoretical framework, the following systems of equation were obtained after substituting the variables that made up OTHERDV, OTHERFINLEV and OTHERINVEST into equation (1)-(3). The following regression equations obtained would be used to test the pecking order theory.

$DV = \alpha_1 + \alpha_2 FINLEV + \alpha_3 INVEST + \alpha_4 PR + \alpha_5 RISK + \alpha_6 TX + \alpha_7 CF + \alpha_8 SZ + \alpha_9 INDDY + U$

(4)

$FINLEV = \beta_1 + \beta_2 DV + \beta_3 INVEST + \beta_4 SZ + \beta_5 STR + \beta_6 PR + \beta_7 TX + \beta_8 RISK + \beta_9 INDFL +$

V   (5)

$$INVEST = \gamma_1 + \gamma_2 DV + \gamma_3 FINLEV + \gamma_4 PR + \gamma_5 GRO + \gamma_6 SZ + \gamma_9 q + W$$

(6)

Where:

<u>FINLEV</u> represents financial leverage, which is measured by $\dfrac{Totaldebt}{MVofthefirm}$

where,

MVofthefirm =Market Value of the firm

Total Debt = long term debt + current liabilities

Market value = total debt + market value of equity

<u>INVEST</u> represents investment, which is measured as growth rate in total assets,

$(\dfrac{Totalasset_t - Totalasset_{t-1}}{Totalasset_{t-1}})$

<u>DV</u> represents dividend payout ratio, measured by $(\dfrac{Dividend}{Distributableearnings})$

<u>PR</u> represents profitability, measured by $\dfrac{PBIT}{Totalasset}$

where,

PBIT =Profit before interest and tax

<u>RISK</u> represents risk or variability in earnings, measured by

Standard deviation of $\dfrac{\Delta PBITD}{Totalasset}$

where,

$\Delta PBITD$ =Annual change in profit before interest, tax and depreciation

TX represents corporate tax, measured by the ratio of company income tax divided by net profit before tax

CF represents cash flow or liquidity measured by the use of working capital

$(\dfrac{Currentasset - currentliabilities}{currentliabilities})$

SZ represents size which is measured by natural logarithm of total assets ($\ln TA$)

where,

TA =Total Asset

INDDY represents industry average dividend yield

STR represents structure of assets, measured by $\dfrac{FA}{MV}$

where,

FA =Total net fixed asset

MV =Market value of equity

INDFL represents an industry's average total debt ratio in the previous year

GRO represents sales grow, measured by ($\frac{Sales_t - Sales_{t-1}}{Sales_{t-1}}$)

q represents q ratio used as a proxy for expected growth and is represented by price-to-book value ratio

The parameters $\alpha_1, \alpha_2 ...., \alpha_9, \beta_1, \beta_2 .... \beta_9, \gamma_1, \gamma_2 .... \gamma_7$ are the regression parameters and U, V and W are the error terms.

Following prior researches in this area including that by Adedeji (1998) and Adelegan (2002) together with the various predictions by the pecking order theory, it is expected that the coefficients of financial leverage (α_2), profitability (α_4), liquidity or cash flow of the firm (α_7), size of the firm (α_8) and the industry average dividend yield (α_9) in the dividend equation would be positive. We also expect a positive sign in the coefficients of investment (β_3), size (β_4), structure of the firm (β_5), corporate tax (β_7) and industrial average total debt ratio (β_9) in the financial leverage equation. Same positive sign is expected of the coefficients of financial leverage (γ_3), profitability (γ_4), sales growth (γ_5), and q ratio (γ_9) of the investment equation. The coefficients of investment (α_3) and riskiness (α_5) of the dividend equation, dividend (γ_2) and size (γ_6) in the investment equation, riskiness of the firm (β_8) and profitability (β_6) in the financial leverage equation are expected to be negative. The coefficient of tax in the dividend equation is also expected to be negative. Due to contradictions in previous studies with respect to the relationship between dividend payout and financial leverage, we can get either positive or negative relation between them.

The Ordinary Least Squares (OLS) estimator of parameters cannot be used to estimate the structural simultaneous equations in the above model. Otherwise, the results would be biased and inconsistent. This happens as a result of the correlation between the random error and the endogenous variables on the right-hand side of the equations.

Furthermore, OLS would not yield good properties if used because there are certain omitted variables from the system of equations and also due to measurement error. Wooldridge (2002) showed that for a system of equation to qualify to be estimated using simultaneous equations model, such an equation should be able to make economic meaning in isolation from the other equations, then we can say the equation meets the autonomy requirement. In this study, all the three equations are specified based on factors affecting each of the dependent variables separated from the factors affecting other dependent variables.

Wooldridge (2002) added that causality is another requirement for the use of simultaneous equation. This means there should be a causal relationship between the variables in which we are interested. This would enable us know the response of the dependent variables if we vary any of the independent variables holding all other variables fixed. This justifies the use of simultaneous equation method in this study.

Only Adedeji (1998) used both OLS and 3SLS technique in his study. Baskin (1989), Allen (1993) and Adelegan (2002) all used only the OLS regression technique in their studies. Alluding to that, the OLS technique would be used in this study to have some results that can be

compared with prior studies in this area. Furthermore, the OLS technique would be used to assess the sensitivity of the 3SLS results.

There are several methods for estimating systems of simultaneous equations. The Indirect Least Squares (ILS) is used to estimate a single equation that is exactly identified. This cannot be applied to this model since it contains a system of equations and overidentified. The two Stage Least Squares (2SLS) estimator is efficient and consistent but ignores information associated with endogenous variables that appear in the system but not in the individual equation. As a result, some information regarding the error covariance is lost (Fortenbery and Park, 2008).

At times, the Seemingly Unrelated Regression (SUR) is used in estimating simultaneous equations. It accounts only for the correlation in the error terms across equations, but does not consider the endogeneity problem associated with each equation. The three Stage Least Squares (3SLS) is considered a combination of 2SLS and SUR. The 3SLS shows a contemporaneous correlation in the error terms across equations and the correlation of the right hand side variables with the error term. 3SLS is asymptotically more efficient than 2SLS (Fortenbery and Park, 2008). That is the reason why this study employs the 3SLS approach to estimate the equations of the model.

In estimating a system of equations using 3SLS, first, we find out whether the equations are identified or not. A system of M equations containing M endogenous variables must exclude at least M-1 variables from a given equation in other for the parameters of that equation to be identified and be consistently estimated. Considering equations 4 to 6 based on the order

condition, we can verify for identification problem using the formulae K-k ≥ M-1, where K is the number of variables in the model, k is the number of variables in a given equation. M is the number of endogenous variables in the model. If K-k = M-1 the equation is just identified and if K-k > M-1, it is overidentified. An equation would not be identified when K-k > M-1. The order condition applied on all three equations showed that the equations are overidentified. So we can estimate the equations using systems estimation methods because it considers all parameter restrictions caused by overidentification in the entire equation system and accounts for possible contemporaneous (cross-equation) correlation of disturbance terms. For our study, stata 12 is used to confirm whether the equations are identified or not.

4.3 Data Processing Methods

In computing the various variables, the study used Microsoft Excel in doing so. Stata 12 is used in estimating the system of equations using the 3SLS approach. Stata 12 is further used to estimate OLS and determine identification of the various equations. OLS is estimated to compare the results with previous studies. The cross sectional approach to data analysis is employed to find the interrelationship between financial leverage, investment and dividend payout ratio according to the predictions of the pecking order theory.

Cross sectional data is used for the estimation because McCabe (1979) and Adedeji (1998) argued that cross sectional test method is more appropriate in assessing long term relationship among variables such as financial leverage, debt ratio and dividend payout ratio, than the inter temporal test method for assessing short term relationships for such variables.

All the variables are represented by their average values calculated from 2004 to 2009. Titman and Wessels (1988) and Bennett and Donnelly (1993) found out that the use of average values are better than the use of single point estimates for testing theories that are related to long term behavior of firms in other to avoid distortions caused by short term variations from the target. Titman and Wessels (1988) used three year averages for all the variables in their study to increase the accuracy of their findings.

This study uses six year average based on the consistency of the available data in the database. The use of averages over longer periods of time increases the efficiency of a particular measure (Titman and Wessels, 1988). Natural logarithms would be used in computing some variables in other to achieve normal distribution and linearity patterns.

4.4 Data Used in the Study

This is a 198 firm-year study (that is 33 firms * 6 years) to test the predictions of the pecking order theory on the 33 listed firms in Ghana. This study uses cross sectional data to analyse the interaction between dividend payout ratio, financial leverage and investment in Ghana using data obtained from the Ghana Stock Exchange. Thirty three out of the thirty four firms listed on the Ghana Stock Exchange were considered in this study. One firm is not included because it had been delisted before 2009. The firms cover all sectors including banking and finance, agricultural, food and beverage, mining, energy sector and other manufacturing firms.

The data used is secondary data solicited from the Ghana Stock Exchange facts book. Annual data from 2004 to 2009 are used. The year 2004 was chosen as the starting year because most of

the quoted firms were listed around that time. As at the time this study was carried out only the GSE facts book 2010 was available, that is why the data ended in 2009. Data used are end of year data of the various firms. Only firms with data existing from December 2004 to December 2009 were added to the study. Following the research by Adedeji (1998), average values of most of the explanatory variables were used in this study.

CHAPTER FIVE

ANALYSIS AND DISCUSSION OF RESULTS

5.1 Descriptive Analysis

Table 5.1 presents the descriptive statistics of the various variables for the observed number of firms. The summary statistics examines the measure of central tendency and measures of dispersion of each variable. The number of observed firms is 33 drawn from the 34 listed firms on the Ghana stock exchange for the period 2004-2009.

Table 5.1 shows that most of the observed variables exhibit considerable variability in their values as can be seen in their standard deviation values. It can be observed from the table that on the average, about 39.22% of total distributable earnings of the sampled firms are paid out as dividends. The mean value of the investment variable is 0.389402. This shows that the sampled firms grew by about 38.94% over the study period.

The average value for financial leverage is 0.483669. This implies that 48.36% of total assets were financed by debt. These value is quiet modest compared to 60% for firms in Germany and France, and 64.3% for South Korean firms (Kasozi, 2009), but also high compared to 44% for firms in South Africa and United States, and then 30.38% for Chinese firms.

Table 5.1: Summary statistics for 198 firm-year observations over the period 2004-2009

Variable	Mean	Std. Dev.	Min	Max
Indfl	1.3787	3.5538	0.0812	21.0752
Str	0.2246	0.2636	0.0105	1.41914
Cf	4.1735	21.323	-0.5745	122.8499
Dv	0.3922	1.1640	-1.9833	5.8132
Finlev	0.4836	0.2587	0.0264	0.9995
Pr	0.0136	0.2603	-1.3643	0.3172
Invest	0.3894	0.4092	-0.0209	2.2754
Tx	0.2444	0.4285	-0.8342	2.0147
Gro	0.5653	0.7667	-0.128	3.1271
Q	345.94	1617.4	-45.917	9153.818
Risk	1.7804	9.0575	0.0118	52.2193
Sz	13.163	2.3115	9.4204	18.2449
Inddy	56815.84	144019	0	785952.3

Notes:

The variables in the table above are computed using stata (version 12). FINLEV= financial leverage, which is measured by total debt/market value of the firm; INVEST = investment, which is measured as growth rate in total assets, (Total asset$_t$- Total asset$_{t-1}$/Total asset$_{t-1}$); DV = dividend pay out ratio, measured by dividend/distributable earnings; PR = profitability measured by profit before interest and tax/total assets; RISK = risk or variability in earnings, measured by the standard deviation of (Annual change in profit before interest tax and depreciation/total assets); TX = corporate tax, measured by the ratio of company income tax divided by net profit before tax; CF = cash flow or liquidity is measured by the use of working capital (current assets – current liabilities/ current liabilities); SZ = size which is measured by natural logarithm of total assets; INDDY = industry average dividend yield; STR = structure of assets, measured by total net fixed assets/market value of the firm; INDFL = an industry's average total debt ratio in the previous year; GRO = sales growth, measured by (sales$_t$ – sales$_{t-1}$/sales$_{t-1}$); q = q ratio used as a proxy for expected growth and is represented by price-to-book value ratio;

Size of the firm variable is measured using the natural logarithm of total assets and have a mean value of 13.16366. This when converted will be about GH¢ 522 million. The maximum or highest value is over GH¢95 billion but due to the GSE's policy of allowing the listing of small scale firms that led to a small average value. The measure of variability in earnings or risk is

178.05%. This shows there is a higher variability and spread in the returns of the GSE listed firms as compared to 34% for the Johannesburg Stock Exchange (JSE) and 31% of Chinese firms (Kasozi, 2009).

Table 5.1 shows that the average annual profitability of the observed listed firms in Ghana is 0.01361. This shows that profit before interest and tax grows by 1.361% per annum. This value is very low as compared to 30% for South African firms. The result is still low compared to firms in developed countries like United States (5.6%) and 2.38% for Chinese firms (Kasozi, 2009).

On the average, 22.47% of the asset structure of firms is made up of fixed asset that is comparable to 30% for South African firms and 29% for Swedish firms (Kasozi, 2009). The average corporate tax growth rate is 24.44%. The minimum value is -0.8343 because some of the firms made losses throughout the study period and are rather given tax rebates.

5.2 Empirical Analysis

Table 5.2 presents the empirical results of testing whether the predictions of the pecking order theory have any impact on dividend payout ratio among Ghanaian firms. The results of testing whether there is any interraction between financial leverage, dividend payout ratio and investment using the Three Stage Least Square (3SLS) approach of simultaneous equations in stata 12 are presented in table 5.2. The table contains values for both the endogenous and exogenous variables. The endogenous variables are dividend payout ratio, financial leverage and

investment. The rest of the variables are the exogenous variables and they serve as control variables in this study.

From the three set of equations (equation 4-6) in chapter 4, it was clear that there is an endogeneity problem in the set of equations. This implies that OLS would generate inconsistent and biased results if applied. That explains the use of simultaneous equation in this study.

In order to be able to estimate a system of simultaneous equations, the identification condition is supposed to be met. If an equation is identified, it means the system of equations contains sufficient information that would enable us estimate the parameters of the model given the specified functional form. Stata was used to determine whether the equations were identified or not. The results as presented in appendix A (Table A1 and A2) showed that the equations were identified. Employing the rank conditions of identification proved that the equations were overidentified, thereby enabling the estimation of the set of equations using 3SLS approach.

The R-squared and adjusted R-squared estimates in the 3SLS results was not given much attention. This is because, although R-squared measures the overall in sample predictive power of the estimator, when we estimate any structural equation using 2SLS in stata, no value is shown for R-squared and adjusted R-squared. This show the values are not important in explaining the estimated results. 3SLS is a combination of Two Stage Least Square (2SLS) and Seemingly Unrelated Regression (SURE) to make it more efficient. Furthermore, some results using 3SLS shows negative adjusted R-squared posing problems in explaining the results. This negative R-squared or adjusted R-squared in two or three stage least squares estimates in stata

occurs because some of the regressors enter the model as instruments during the parameter estimation. Since our goal is to determine a structural model, the actual values not the instruments for the endogenous right-hand side variables are normally used to compute R-squared. The models residuals are estimated over a different set of regressors from those used for the model. 2SLS/3SLS estimates are no longer tested within a constant-only model of the dependent variables and the residual sum of squares is no longer constrained to be smaller than the total sum of squares. This then give rise to a negative R-squared (STATA, 2009).

Prior studies including Adelegan (2002) and Adedeji (1998) employed OLS regression technique in their estimation. Adedeji (1998) further used the 3SLS in his study, so as to enable him compare the OLS results to earlier studies. In addition, the OLS regression technique is been employed in this study to in order to compare the results with that of the 3SLS to check its sensitivity. Table 5.3 presents the OLS regression results and table 5.4 compares the OLS results with that of Adedeji (1998) and Adelegan (2002). These two studies compared their results to prior studies and are among the most current and rigorous studies that test the predictions of the pecking order hypothesis on dividend payout. This two researches were chosen because one from a developed country and the other from a developing country. Table 5.2 below summarises the results of the 3SLS

Table 5.2: 3SLS regression results for testing the interaction between financial leverage, dividend payout ratio and investment.

Variable	Equation 4	Equation 5	Equation 6
Dependent	DV	FINLEV	INVEST
DIV		0.041019	-0.02145
FINLEV	2.051159*		-0.55704
INVEST	0.8864387*	0.446002	
PR	6.196494***	-1.07245**	0.066132
RISK	0.1642148***	-0.01826	
TX	0.9209563*	0.027433	
CF	-0.0295338***		
SZ	-0.117833**	0.037764***	0.045475**
INDDY	1.41E-06		
STR		-0.76849*	
INDFL		0.009404	
GRO			0.131559
Q			-1.02E-05

***, **, * indicate values are significant at 1%, 5% and 10% level respectively. The estimates reported are obtained by using the three stage least square (3SLS) regression procedure in stata 12.

Table 5.2 above indicates that in the 3SLS results, financial leverage (FINLEV) and dividend payout ratio (DV) have the predicted positive interaction between them. This implies that, as firms in Ghana increase their dividend payment there would be a reduction in available funds to finance profitable investment. Firms would then increase their debt by borrowing more (increase financial leverage) to finance positive NPV projects. This accounts for the positive interaction between financial leverage and dividend payout ratio as predicted by the pecking order theory and supports the findings of Adedeji (1998) and Adelegan (2002). In addition, this result shows that firms in Ghana respond to their earnings shortage by borrowing to pay dividends.

Dividend payout ratio (DV) has no significant impact on investment (INVEST), whereas investment (INVEST) has a positive significant effect on dividend payout ratio (DV). Hence, there is no significant interaction between investment (INVEST) and dividend payout ratio (DV) among listed firms in Ghana. This is an unexpected result. The positive impact of investment (INVEST) on dividend payout ratio (DV) might be due to the fact that firms would not like to reduce dividend payment even if they increase investment. A reduction in dividend payment is a bad signal to investors and may lead to a reduction in the market price of shares. This may have an adverse impact on the market value of the firm. It would send a message to investors that management of the firm is incompetent. Managers in an attempt to safeguard their self esteem would not like to reduce dividend payment but would rather increase debt or equity to finance dividend payment. This indicates that dividend decisions of firms in Ghana are independent of the investment decisions they make.

The 3SLS regression result shows that there is no significant interaction between investment (INVEST) and financial leverage (FINLEV). This confirms the result obtained by Adelegan (2002) and that of Adedeji (1998).

5.3 OLS Regression Results

Woodridge (2002; 236) agrees that, in estimating 3SLS, we can further estimate the equations by using OLS. This is done in other to find out how ignoring the endogeneity problem would affect our results

.The OLS result shows approximately that 58%, 89% and 43% of the variation in dividend payout ratio (DV), financial leverage (FINLEV) and investment (INV) respectively are explained by their respective regressors. The F statistics for all the equations in both the OLS and 3SLS regression results exhibit a high level of significance at 1%. Implying that all the equations in the model have passed the goodness of fit test and the model is correctly specified.

The results obtained from the OLS regression do not show much difference in terms of the interaction between financial leverage (FINLEV), corporate investment (INVEST) and dividend payout ratio (DV) with that of the 3SLS regression results. The only difference is that, in the 3SLS results, dividend payout ratio (DV) exhibits a positive but not significant impact on financial leverage but the OLS results show a positive significant impact on financial leverage. This is consistent with the study by Adelegan (2002)

Table 5.3: The OLS regression estimates

Variable		Equation 4		Equation 5		Equation 6
Dependent		DV		FINLEV		INVEST
DIV				0.1123481		0.0811238
				(3.37)***		(1.02)
				{0.0333536}		{0.0793115}
FINLEV		2.396126				-0.1354465
		(3.94)***				(-0.37)
		{0.6081007}				{0.3663013}
INVEST		0.9712568		0.0825461		
		(2.60)*		(0.69)		
		{0.3735112}		{0.1201504}		
PR		6.440956		-1.324536		0.0714288
		(3.58)***		(-3.07)***		(0.24)
		{1.799779}		{0.431992}		{0.3019215}
RISK		0.1703939		-0.0293384		
				(-2.41)**		
		(3.37)**		{0.0121845}		
		{0.0505522}				
TX		0.8610191		0.0515892		
		(1.62)		(0.67)		
		{0.530177}		{0.0766089}		
CF		-0.0282245				
		(-2.72)**				
	¤	{.0103746}				
SZ		-0.1340381		0.0402317		0.0296893
		(-4.30)***		(9.22)***		(2.05)*
		{0.0311467}		{0.0043637}		{0.0144854}
INDDY		1.54E-06				
		(1.39)				
		{1.54e-06}				
STR				-0.3591811		
				(-1.90)*		
				{0.1893946}		
INDFL				0.0143954		
				(1.52)		
				{0.0094653}		

GRO						0.0709284
						(0.69)
						{0.1023794}
Q						-1.42E-05
						(-0.30)
						{0.0000468}
R^2		68.55%		91.72%		54.16%
Adj R^2		58.48%		89.07%		43.98%
F-stat		6.81		34.61		5.32

Values in ( ) are the t-values and those in { } represents values of their standard error. ***, **, * indicate values are significant at 1%, 5% and 10% level respectively. The estimates reported are obtained by using the OLS regression procedure in stata 9.

For the control variables, OLS regression results differ from the 3SLS regression in 2 main ways. Firstly, the 3SLS result shows a positive significant impact of tax (TX) on dividend payout ratio, whereas the OLS results show a positive insignificant impact. Secondly, risk of the firm had been found by the OLS results to have a significantly negative effect on financial leverage, but the 3SLS results saw an insignificantly negative effect. The rest of the results show no significant differences.

Both OLS and 3SLS regression indicates that profitability (PR) of the firm has a significantly positive impact on dividend payout ratio (DV) as expected. Highly profitable firms have high dividend payout ratios as predicted by the pecking order theory. Profitability (PR) of the firm shows a negative significant impact on financial leverage (FINLEV) for both approaches. This is also expected because firms making more profit would borrow less. The reason being that more profitable firms have higher retained internal financing available to them but less profitable firms have no choice than to seek external financing and consequently accumulate more external debt.

The results further show that Profitability (PR) has no significant impact on investment (INVEST).

Risk (RISK) of the firm has a positive significant effect on dividend payout ratio (DV) for both OLS and 3SLS results, this finding contravene the theories in existing finance literature. This implies that risky firms with unstable earnings pay more dividends than stable firms with less risky earnings. Again, the result might be due to the nature of dataset and the period under study, because about 6% of the firms under study have stable earnings but never paid dividends throughout the study period. The rest of the firms that had stable earnings did not pay dividends regularly throughout the study period. Firms with less risk pay smaller or no dividends because they would like to invest that amount in projects with positive NPV or in other firms and pay dividends later. Shareholders, who want to evade higher personal income tax, can encourage management and the board of directors to invest the dividends due to them in other projects. This is done in order to recoup dividend at a future date in order to evade tax. The 3SLS regression shows no significant impact of risk (RISK) on financial leverage (FINLEV), but the OLS results indicate a negative significant effect on financial leverage (FINLEV). The result is consistent with the study by Titman and Wessels (1988).

The OLS result indicates that there is no significant impact of corporate tax (TX) on dividend payout ratio (DV) and financial leverage (FINLEV). 3SLS shows there is a positive significant impact of corporate tax (TX) on dividend payout ratio. This result is contrary to that in existing literature but consistent with the study by Amidu and Abor (2006) on listed firms in Ghana. An increase in corporate tax (TX) is associated with increase in dividend payout ratio (DV). This

happens when corporate income tax is higher as compared to capital gains tax. When that happens, firms would want to pay greater part of their profit to shareholders as dividends, so they can evade the higher corporate tax burden and pay smaller amount as capital gains tax.

Cash flow (CF) indicates a negative significant influence on dividend payout ratio (DV) both in the OLS and 3SLS results. This result is contrary to the expectations of this study. Yet, this result is consistent with the relation between risk and dividend payout ratio. This relation shows that firms with higher amount of idle cash with management would pay smaller amount of dividends. Managers do that in order to maximize perquisites on the job at their own benefit. This has always been the cause of the shareholders and management agency conflict.

Size of the firm (SZ) has a significantly negative impact on dividend payout ratio (DV) and positively significant influence on financial leverage (FINLEV) and investment (INVEST). Only the impact of size (SZ) on financial leverage (FINLEV) is expected. Larger firms pay fewer dividends according to both OLS and 3SLS results. This is because most of the sampled large firms made losses most of the years under study and hence, did not pay dividends. Size of the firm has a positive impact on investment because; some large sized firms might have started investing in fixed assets due to some of their fixed assets becoming obsolete.

Industrial average dividend yield (INDDY) proved not to have any significant influence on dividend payout ratio (DV). Likewise industrial average total debt ratio (INDFL) has no significant effect on financial leverage (FINLEV). Sales growth (GRO) and q ratio (q) do not also have any significant impact on investment.

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Table 5.4 below compares the results of this study with that of previous evidence reported by Adedeji (1998) and Adelegan (2002). These are part of the most current and rigorous tests of the predictions of the pecking order theory on dividend payout ratio before this study, Adedeji (1998) from a developed country and Adelegan (2002) from a developing country. There are other studies in this area but these two studies compared their results to those studies (Baskin, 1989, Allen, 1993). Adedeji (1998) concluded that his results are similar to previous studies; the only difference is that his results showed no significant impact of financial leverage on investment.

Table 5.4: comparison of results with prior studies

	Effect on DV			Effect on FINLEV			Effect on INVEST		
Variable	Adedeji	Adelegan	Doku	Adedeji	Adelegan	Doku	Adedeji	Adelegan	Doku

	1998	2002	2012	1998	2002	2012	1998	2002	2012
DV	N/A	N/A	N/A	Positive (Positive)	Zero	Positive (zero)	Positive (Negative)	Zero	Zero (Zero)
FINLEV	Positive (Positive)	Positive	Positive (Positive)	N/A	N/A	N/A	Zero (Zero)	Zero	Zero (Zero)
INVEST	Zero (Negative)	Zero	Positive (Positive)	Zero (Positive)	Zero	Zero (Zero)	N/A	N/A	N/A
PR	Zero (Zero)	Negative	Positive (Positive)	Negative (Zero)	Zero	Negative (Negative)	Positive (Zero)	Zero	Zero (Zero)

N/A shows not applicable and zero indicates there is no significant relation between the variables

The main difference between this study and prior results in terms of the main variables is that, this study finds a positive significant influence of profitability (PR) on dividend payout ratio (DV). This is consistent with existing theories in the finance literature. As firms make more profit, they have more cash available to distribute as dividends. The rest of the result harmonizes with prior studies in terms of the interaction between dividend payout ratio (DV), financial leverage (FINLEV) and investment (INVEST), and the impact of profit on these endogenous variables.

5.4 Conclusion of Findings

The general objective of this study is to determine whether the predictions of the pecking order theory have any impact on dividend payout ratio in Ghana. The specific objectives as stated earlier is to find the interaction between dividend payout ratio (DV), financial leverage

(FINLEV), and investment (INVEST). The study further investigated the impact of profitability on dividend payout ratio (DV), financial leverage (FINLEV), and investment (INVEST) among listed firms on the GSE.

Using a 3SLS regression approach of simultaneous equations and the OLS regression method, the study concludes that there is a positive interaction between financial leverage (FINLEV) and dividend payout ratio (DV) of firms in Ghana over the period 2004-2009. It further concludes that there is no interaction between financial leverage (FINLEV) and investment (INVEST) over the same period. Although investment (INVEST) has a positive influence on dividend payout ratio (DV), dividend payout ratio (DV) does not have any significant influence on investment. This only suggests that the dividend decisions of listed firms in Ghana are made independent of their investment decision that gave rise to such a relation. Profitability (PR) of a firm is found to have a positive influence on dividend payout ratio (DV) and negatively related to financial leverage (FINLEV) with no significant impact on investment (INVEST).

The study further concludes that riskiness of a firm (RISK) or variability in earnings and corporate taxes (TX) have a positive significant impact on dividend payout ratio. Cash flow (CF) or liquidity of a firm and size of the firm (SZ) were found to have a negative significant influence on dividend payout ratio (DV). Profitability (PR) of a firm, riskiness (RISK) of a firm and structure of asset (STR) were found to have negative significant effect on financial leverage, whereas size of a firm (SZ) exhibits a positive significant impact on financial leverage (FINLEV) and investment (INVEST). The rest of the control variables did not show any significant influence.

The only disparity between the results of this study and that of prior studies is that investment (INVEST) has a positive significant impact on dividend payout ratio (DV). Dividend payout ratio (DV) did not show any significant impact on investment (INVEST). The study concluded that, there is no interaction between financial leverage and investment. Since the findings of this study shows a positive significant interaction between financial leverage and dividend payout ratio as predicted by the POT, we can conclude that listed firms in Ghana to some extent follow the predictions of the pecking order theory in explaining dividend payout ratio in Ghana.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Summary and Conclusion

The pecking order theory predicts that if firms respond to their earnings shortage by borrowing to finance investment and dividend, financial leverage would have a positive impact on investment and dividend payout ratio. Other firms may respond to their earnings shortage by postponing investment and borrowing to pay dividends. This would lead to a positive relation between financial leverage and dividend payout ratio, and a negative relation between financial leverage and investment. Baskin (1989) asserted that due to information asymmetry, profitable firms would prefer to finance investment and dividend with retained earnings than the use of debt. This would lead to a positive relationship between profitability of a firm and dividend payout ratio, and a negative impact of profitability on financial leverage.

The prime objective of this study was to determine whether the predictions of the pecking order theory explains dividend payout ratio in Ghana. The study was carried out by finding the interrelationship between dividend payout ratio, financial leverage and investment using a 3SLS and the OLS regression model. The study further sought to ascertain the impact of profitability on dividend payout ratio, financial leverage and corporate investment. Both the three stage least square (3SLS) approach of simultaneous equations and the ordinary least square pedagogy were used to establish these relationships. This was done by using data from 33 out of the 34 listed firms on the GSE.

The findings indicate that on the average 39.22% of total distributable earnings are paid out as dividends, leaving 60.78% as retained earnings to finance positive NPV projects and to add to their capital stock. This suggests that most firms in Ghana have capital structures modeled after the pecking order theory. The theory suggests that firms would always want to finance

investment and dividend with more retained earnings or internal finance. Firms would only seek external finance only when all internal earnings are used up.

The study found that financial leverage and dividend payout ratio have the predicted positive interaction between them over the period 2004-2009 for Ghanaian firms as postulated by the Pecking Order Theory. The OLS results provided stronger evidence to this conclusion than the 3SLS results. This result is in contrast to the trade–off theory which suggests that as dividend payout ratio increases, external financing (debt) reduces, proving a negative relation between dividend and leverage. Furthermore, financial leverage and investment exhibited no significant interaction between them. This is consistent with the OLS results by Adedeji (1998).

The findings further revealed that, there is no interaction between investment and dividend payout ratio among listed firms in Ghana. This result is also consistent with that of Adelegan (2002). The only difference is that, this result shows investment to have a positive significant impact on dividend payout ratio. This implies that the dividend decisions made by listed firms in Ghana are independent of their investment decisions.

In addition, profitability of the firm has a positive significant effect on dividend payout ratio and a significantly negative impact on financial leverage. This result is also in harmony with the predictions of the pecking order theory. Firms with higher profitability are more likely to pay more dividends and would have more available funds to use as retained earnings to finance investment. With more funds available, firms would want to use internal sources of finance

leading to a reduction in the need for external finance (including debt). This leads to a reduction in financial leverage whenever profit increases.

The results further indicate that size of the firm has a negative significant effect on dividend payout ratio and a significantly positive influence on financial leverage and investment. The relation between size and financial leverage might be that smaller firms in Ghana have easy access to credit than larger firms. This result contradicts the predictions of the pecking order theory and supports the static trade-off theory. The static trade-off theory postulates that there are economies of scale in bankruptcy cost, implying that the agency cost of debt will be lower for larger companies and so a positive relation between size of the firm and financial leverage (Rajan and Zingales, 1995). This result is also in consistent with the study by Abor and Amidu (2006). They found a positive impact of size on dividend payoutratio, the reason is that growing firms require more funds to finance their growth and so would reduce dividend payment in other to retain greater part of their earnings

The results indicate that risk or variability of earnings has a positive significant effect on dividend payout ratio. This might be because, most listed firms did not pay dividends most of the period under study amidst having stable earnings. About 6% of the observed number of firms had stable earnings but never paid dividends throughout the period under study. Hence, as the variability of earnings/risk reduces dividend payout ratio also reduces. Risk also has a negative significant impact on financial leverage. This is because firms with more risk would not like to increase debt due to the financial risk associated with it.

The findings indicate that corporate tax has a significant positive effect on dividend payout ratio. This contradicts that in existing literature but consistent with the study by Amidu and Abor (2006) on listed firms in Ghana. This happens when corporate income tax in a country is higher than capital gains tax on dividend yield. Firms would prefer to pay more dividends to shareholders so that they can pay less tax in the form of capital gains tax in order to avoid the higher corporate tax burden.

Cash flow indicates a negative significant influence on dividend payout ratio. This result also contravenes theories in the existing literature. The result implies that, firms with higher amount of idle cash with management would pay fewer dividends. Managers pay smaller dividends in order to maximize perquisites on the job at their own benefit. This tends to worsen the shareholders –management agency conflict. This might account for the frequent cases of merger, acquisition and takeovers in Ghana.

Industrial average dividend yield has no significant impact on dividend payout ratio. This only shows that firms in Ghana do not target their average dividend yield when making dividend decisions. It is further observed that industrial average total debt ratio has no significant effect on financial leverage; this implies that industrial average total debt ratio does not affect financial leverage decisions of firms in Ghana.

The result pointed out that Ghanaian firms respond to their earnings shortage by borrowing to finance dividends and postponing investment. This indicates that Pecking Order Theory explains dividend payout ratio among Ghanaian firms. This result supports the findings by Abor (2008).

Size of the firm which serves as one of the control variables is the only variable that supports the trade-off theory in this study. This shows that firms cannot view the pecking order theory and the static trade-off theories as mutually exclusive (Fama and French, 2002)

6.2 Policy recommendations

The result of this study sheds more light on the pecking order theory, and concludes that the Pecking Order Theory to some extent explains dividend payout ratio in Ghana. Financial leverage which is measured by, total debt divided by total market value of the firm has a significant positive impact on dividend payout ratio. The findings showed that, most listed firms in Ghana use more debt than equity sources of financing dividends. The reason may be that our capital market is less developed and unattractive, but our banking sector is more developed and performs better than the stock market. Osei (2008) posits that the Ghana Stock Exchange is inefficient in its practices; this might have contributed to this relationship.

The poor development of the capital market can be improved by developing the bond market in Ghana to increase the availability of long-term external source of funds to provide Ghanaian firms with more alternative sources of finance. If the bond market in Ghana is well developed, it would enhance financial development in Ghana. There is the need for policy makers in Ghana to consider the inefficiency of credit management and the practices of banks too in Ghana. Inefficient management serves as obstacles in realizing the monetary policy objectives to stimulate economic growth.

The study showed that financial leverage and dividend payout ratio have the predicted positive interaction between them. This shows that the pecking order theory explains dividend payout ratio in Ghana. A positive relation implies that firms in Ghana respond to their earnings shortage by borrowing to pay dividend rather than falling on equity sources of finance. However, firms have higher retention levels and pays on average only 39.22% of total distributable earnings as dividend. Government should assist firms to increase their profitability by strengthening both the capital market and other financial markets to provide firms with more alternative and easier sources of raising funds or capital. This will reduce the reliance on internal sources of funds and to pay higher dividends.

The findings further indicate that dividend payout ratio in Ghana is very low. The data demonstrated that about 6% of the observed number of firms with stable earnings paid no dividend throughout the study period. There is the need for policy makers to strengthen and enforce laws on dividend payment to encourage most firms to do so, to reduce shareholders-management agency conflict. This would encourage more participants in the capital market seeing the yield of their investment in the form of higher and more regular dividend payment.

Corporate tax has a positive impact on financial leverage. This is due to the tax rebate given to listed firms in Ghana. It happens when the government increases corporate income tax, most firms would be encouraged to go public in other to evade the higher tax burden and also increase debt in their capital structure. If policy makers want to encourage most firms to list, then there is the need to strengthen the tax incentives for publicly listed companies and to target specifically newly listed firms.

The GSE needs to be demutualised, restructured and reformed to meet the challenges of globalisation. Most Ghanaians seem to be ignorant about the stock exchange; there is the need to sensitize firms through advertisement on the prospects of listing and listing rules. To the general public, explaining to them why they should invest in bonds and stocks, and where to buy them. This would increase the number of market participants and the performance of the stock exchange, leading to the curbing of some of the inefficiencies in the stock market.

The study finds out that cash flow or liquidity of a firm has a significant negative effect on dividend payout ratio in Ghana. This finding indicates that most firms would like to hold cash in their balance sheet than to pay them out as dividends or use them on profitable investments. According to financial theory, having too much cash is not optimal from the shareholders viewpoint due to the opportunity cost of holding cash; such funds can be invested to earn an additional return and increase the value of cash. Mostly, managers might not be willing to pay the money out as dividends but rather waste it on their private pet projects, self serving and value-destroying purposes leading to mergers, acquisitions and takeovers. It is recommended that, if management cannot find positive investment opportunities, the excess cash should be returned to shareholders as dividends to curtail the management agency conflict. This can be achieved by encouraging Board of Directors to approve greater part of profit after interest and tax to be paid out as dividends.

6.3 Limitations and areas for future research

Firstly, variables like overseas profit, specialization ratio, research and development, irrecoverable advanced corporation tax and deferred tax were excluded from our analysis. This is because data on such variables were nonexistent in Ghana; this might have an effect on our empirical results.

Secondly, all the variables used in the study are proxies. Although the proxies are based on prior theoretical and empirical studies, they remain proxies and may not perfectly represent the theoretical propositions.

Finally, most researches that test pecking order hypothesis use debt equity ratio as their measure of financial leverage. This study employed the approach by scholars who advocate the use of total debt as the measure of financial leverage. Rajan and Zingales (1995) postulated that total debt use tends to over score the amount of leverage firms have. This might affect the results of this study.

The findings of this study indicate that corporate tax has a positive significant impact on dividend payment. Similar relation was found between these two variables in the study by Amidu and Abor (2006) for same listed firms in Ghana but contrary to that found in existing literature. There is the need for a further research to determine the role of corporate tax ortn dividend decision making in Ghana.

Various methods have been used to test pecking order theory in Ghana. But no research has been found that used Fama and French valuation regression to determine the interaction between asymmetric information and corporate investment decision in Ghana, as predicted by the pecking order theory. Future researches can focus on doing that.

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APPENDIX

Appendix A. Identification Determination

Table A1: Endogenous coefficients matrix

	Dv	Finlev	Invest
Dv	-1	.5	.5
Finlev	.5	-1	.5
Invest	0	.5	-1

TableA2: Exogenous coefficients matrix

	pr	tx	cf	Inddy	risk	sz	str	indfl	q	gro
Dv	.5	.5	.5	.5	.5	.5	0	0	0	0
Finlev	.5	.5	0	0	.5	.5	.5	.5	0	0
Invest	.5	0	0	.5	0	.5	0	0	.5	.5

Eq 4 is identified

Eq 5 is identified

Eq 6 is identified

System is identified

Appendix B

Appendix B. Correlation among variables

	dv	Finlev	Invest	Indfl	str	cf	Pr
dv	1.0000						
finlev	0.4050 (0.0194)	1.0000					
invest	0.2341 (0.1897)	0.0787 (0.6632)	1.0000				
indfl	0.1190 (0.5095)	0.3478 (0.0473)	0.0562 (0.7562)	1.0000			
str	-0.1606 (0.3721)	-0.2527 (0.1559)	0.5994 (0.0002)	-0.1903 (0.2889)	1.0000		
cf	-0.3536 (0.0435)	-0.1555 (0.3876)	-0.0774 (0.6685)	-0.0353 (0.8453)	-0.0854 (0.6364)	1.0000	
pr	0.1873 (0.2965)	-0.0694 (0.7013)	0.1516 (0.3997)	0.0470 (0.7950)	-0.2412 (0.1764)	0.0132 (0.9420)	1.0000
avgdiv	-0.0328 (0.8563)	0.1221 (0.4986)	-0.2003 (0.2636)	0.0266 (0.8831)	-0.0601 (0.7396)	-0.0820 (0.6503)	0.0157 (0.9311)
tx	-0.0357 (0.8438)	0.0139 (0.9389)	-0.1474 (0.4131)	0.0380 (0.8338)	-0.2704 (0.1281)	0.7414 (0.0000)	0.1400 (0.4372)
gro	0.3386 (0.0539)	0.0216 (0.9050)	0.2030 (0.2571)	-0.0723 (0.6894)	-0.0524 (0.7723)	0.2667 (0.1335)	0.2103 (0.2402)
q	-0.0155 (0.9318)	0.1899 0.2898	-0.0164 (0.9277)	-0.0324 (0.8578)	-0.1507 (0.4026)	-0.0403 (0.8237)	0.0127 (0.9439)
risk	-0.0745 (0.6801)	0.0140 (0.9385)	-0.1860 (0.3001)	-0.0365 (0.8403)	0.1824 (0.3097)	-0.0267 (0.8827)	-0.9504 (0.0000)
sz	-0.1169 (0.5171)	0.3783 (0.0299)	0.1333 (0.4597)	0.0815 (0.6520)	0.0847 (0.6395)	-0.2931 (0.0978)	0.1745 (0.3315)

Appendix B. continuation of correlation among variables

	Inddy	tx	gro	q	risk	Sz
Avgdiv	1.0000					
Tx	-0.1031 (0.5680)	1.0000				
Gro	-0.0923 (0.6095)	0.2104 (0.2399)	1.0000			
Q	0.0885 (0.6242)	0.0404 (0.8235)	-0.0204 (0.9101)	1.0000		
Risk	-0.0595 (0.7422)	-0.0993 (0.5823)	-0.1336 (0.4585)	-0.0420 (0.8166)	1.0000	
Sz	0.5862 (0.0003)	-0.1794 (0.3179)	-0.1434 (0.4259)	0.3545 (0.0430)	-0.2344 (0.1892)	1.0000

NOTE; Variables in bracket are p values