FIRM CHARACTERISTICS AND CAPITAL STRUCTURE OF LISTED OIL AND GAS FIRMS IN NIGERIA

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DECLARATION

I declare that this Dissertationtitled "Firm Characteristics and Capital Structure of Listed Oil and Gas Firmsin Nigeria" has been performed by me in the Department of Accounting. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma at this or any other institution.

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CERTIFICATION

This dissertation titled **FIRMS CHARACTERISTICS AND CAPITAL STRUCTURE OF LISTED OIL AND GAS FIRMS IN NIGERIA by HADIZA UMAR** meets the regulations governing the award of the degree of Master of Science in Accounting and Finance of the Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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ABSTRACT

Thisstudy examined the effect of firm characteristics on capital structure of listed oil and gas firms in Nigeria for the period 2006-2016. The listed oil and gas firms are ten (10) in numbers out of which a sample of eight (8) was used for the study. Firm characteristics as the independent variable were proxied by; profitability, firm growth, asset tangibility, liquidity and firm size, while the debt to total assets was used as a proxy for capital structure of firms. However, market leverage was used and two leverage ratios (total debt to market value of assets and long term debt to market value of assets) were used to define the capital structure. Correlational research design was used in the study. The study made use of multiple regression technique and data were collected from secondary source consisting of annual reports and accounts of the firms under study.The findings revealed that all of the explanatory variables (profitability, growth, tangibility, liquidity and size) were significant in explaining the capital structure of the Nigerian listed oil and gas firms. However, only profitability was significant to both measures of leverage while the remaining four were significant with only one of capital structure measurements. Profitabilityand growth both had a significant negative effect on the capital structure of listed oil and gas firms in Nigeria. While on the other hand, tangibility, liquidity and firm size all had positiveand significant effect on the capital structure of firms. Based on the findings of the study, it is therefore recommended that management of firms should be profit driven by adopting policies like cost control and cost reduction tools and also by ensuring that their assets are efficiently and effectively utilized in order to generate more sales revenue. This will enable them accumulate substantial retained earnings which may be used to financefuture growth opportunitieswithout necessarily opting for excessive debt.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

All forms ofbusiness organisation whether large or small need money to startand to meet their daily and long-time obligations if they want to maintain a going concern status. These businessesexist to achieve various goals which includeprofit maximization, shareholder value maximization, sale volume and sale revenue maximization, increased market share, survival, ethical goal, and satisficing. Achieving these goals translates into meeting harmonized expectations of stakeholders.Focal to this sought-after accomplishment is informed consideration of financing channels available to the firm. The financing optionsavailable to a firmare debt or equity which forms itscapital structure. According to Chechet, Garba and Odudu (2013), a perfect combination of debt and equity is very important to the growth and future of a firm if properly utilized. Thus, the importance of capital structure decisions in the achievement of a firm’s goals cannot be over emphasized.

The theory of capital structure was first introduced by Modigliani and Miller (1958) in their seminal paper on therelevance of capital structure to the value of a firm under perfect market based on some assumptions (where there are no transaction costs, no corporate and personal taxes, symmetric information, amongst others). Thus, the irrelevancy theory arguably forms the basis of modern thinking on capital structure in finance. For the past decades following the work of Modigliani and Miller, intensive research has been conducted to empirically test the validity of their theory. Capital structure research has focused on whether financial decisions become relevant if these assumptions are relaxed. As noted by Bevan and Danbolt (2002), under market imperfections, firms will determine and attempt to select level of debt-equity mixthat will make an optimal capital structure. Therefore, determining optimal capital mix has been the focus of corporate finance literature.

Capital structure according to Martina (2015) is the way a corporation finances its assets through the mixture of debt and equity. Whether a firm is financed by debt or equity or a combination of both has some implications. As both involve costs to the company, there is need for the company to choose the right option that minimizes its cost and in most cases companies tend to choose the most probable least-cost combination. Thus, the debt and equity proportions are the measurement tools for capital structure. Determining debt and equity is an important decision faced by companies.Consequently,studies indicate that companies without borrowings (unlevered firms) show less fluctuations in their earnings, whereas companies with borrowings (levered companies) show greater fluctuations in their earnings when there are changes in their financial performance (Ojo, 2012; Akhtar, Javed, Maryam, & Sadia, 2012and Hasanzadeh, Torabynia, Esgandari& Kordbacheh, 2013). Some specific implications of borrowing on levered firms are outlined as follows: borrowings require interest payments that in effect, slash firms' net incomes, interest expenses are costs that increase the volatility of net incomes and thus, affect EPS and borrowings also relatively reduce the proportion of the equity in a company's capital structure and thus, reduce the number of shares outstanding. Therefore, companies have to carefully structure their capital mix so that the best result can be achieved.Chechet *etal* (2013) opined that an optimal combination of capital structure is one that not only maintains the stability but also enhances the firm's wealth.

However, many factors are considered when making this important financial decision, because a wrong turn may lead the firm to financial instability or distress which is not the aim of a going concern. According to Akbar and Bhuntton (2012), capital structure of any firm is based on definite characteristics or cost and benefit analysis of debt and equity. Also, Chechet *et al* (2013) are of the opinion that since capital structure decision is a long term issue, by identifying the factors that determine capital structure overtime, manager will be informed and know how to adjust their financial mix to the optimal level. As such, researchers have dived into what constitutes and determines the best capital mix that maximizes the firm's value. Thus, determinant of capital structure have been debated for several years yet it still remains the most significant unsettled issue in the field of corporate finance (Shehu, 2012; Martina, 2015; Butt, 2016).

Therefore, extant literature has identified factors that determine capital structure choice.However, these factors according to Bundala and Machogu (2012), are not conclusive and cannot be generalized because there are micro factors that can be influenced by technology and operative political policies of a particular country. Masnoon and Anwar (2012) also observed that apart from country specific and institutional factors, firms related factors are major important factors that can influence capital structure choices. Therefore, industry factors, firm-specific factors and macroeconomic factors are among the determinants of capital structure. These factors play important roles in capital structure decisions and are variables that affect the firm decisions both externally and internally (Shehu, 2012). These factors are distinct and are believed to impact differently on capital structure of firms. The incentives range from liquidity, profitability, growth, size, age, non-debt tax shields, business risk, asset tangibility, industry median, expected inflation among others. So, firms' managements need to be aware of them so that appropriate decisions on capital mix can be taken.

Firm Profitability is the determining measure of the economic success of a firm in relation to capital employed which invariably serves as the basic concern of its shareholders (Nawaiseh, 2015). A company that is not making profit may find it difficult to finance future growth opportunities.This is because lenders may be reluctant to give loan to firms with poor financial position. Also, such firms would not have retained earnings which can be accumulated and used to finance viable projects. Thus, profitability is a firm characteristic that plays an important role in the financing choice of corporate managers. Therefore, profitable firms have strong financial position; hence, access to relatively cheaper debt or retained earnings for investments.

The size of a firm also plays an important role in its capital structure decisions. According to relevant literature, large firms have the following advantages over smaller firms; they are more diversified, have easy access to the capital market, receive higher credit ratings for debt issues, pay lower interest rate on debt capital, have less volatile cash flow, have more dilute ownership, less prone to bankruptcy and so on (Alkhatib, 2012).

Liquidity is another variable whose importance cannot be over looked in the financial decision making process of any business organization whose aim is to make profit and maximize the wealth of shareholders. Liquidity is the ability of a company to meet its short and long term obligations as at when due.So, the higher the liquidity of a company the better it is able to pay the debt interests. A company with high liquidity can rely on debt as a great contributor to capital structure because it can easily pay its debt.On the other hand, such companies may use their own capital to finance investment (Ghasemi & Razak, 2016).

The tangible assets of a firm can be considered as embodiments of surety to its creditors. Therefore, the importance of those assets among total assets influences its level of debt. As noted by Koksal and Orman (2015), tangible assets are likely to have an impact on the borrowing decisions of a firm because they are less subjected to information asymmetries and they have a greater value than intangible assets in case of bankruptcy. In addition, the moral hazard risks are reduced when the firm offers tangible assets as collateral, because this constitutes a positive signal to the creditors who can request the selling of these assets in the case of default. As such, tangible assets constitute sound collateral for loans. Therefore, the greater the proportion of tangible assets on the balance sheet (fixed assets divided by total assets), the more willing lenders should be to grant loans and the higher the leverage. (Rajan & Zingale, 1995).

Firm Growthsare viewed as intangible assets of firm. Firms with significant future growth opportunities are likely to face difficulties in raising finance from debt market because intangible assets are not fully collaterallizable (Jensen & Meckling, 1986). Thus, Fama & French (2002) posited that, firms with high intangible growth opportunities will use more of equity rather than debt in their capital structure.

The Nigeria oil and gas sector plays a vital role in the economy. Since the discovery of oil in the 50's, there has been a heavy reliance on the income generated from this sector. The revenue generated by the government from the sector is used in transforming and developing the country. However, the downstream sub sector of the Nigerian oil and gas sector witnessed a partial deregulation in April, 2004 during the Obasanjo administration leading to growth and expansion in the sector (Monday, Ekperiware & Muritala, 2016). According to Fawibe (2009), deregulation is the removal of government control, withdrawal of sales interference, encouraging free market operation, and simplification of government rules and regulations for greater market participation and deepening. Thus, deregulation will undoubtedly improve the efficient use of scarce economic resources by subjecting decisions in the sector to the operations of the forces of demand and supply. This will attract new sellers, buyers and investment/investors into the market.

Consequently, firms in this sector, in order to cope with the expansion resulting from increase in investment, need additional fund to finance such investment. Selecting the best source of financing will undoubtedly lead to value maximization and healthy growth. Therefore, managers in this sector need be furnished with the knowledge of determinants of capital structure to facilitate their choice of optimal capital mix.

1.2 Statement of the Problem

In an attemptat finding out what informs optimal capital structure choice, researchers have investigated the determinants of capital structure.Notable among these works are: Bradley, Jarrell and Kim (1984), Titman and Wessel (1988), Haris and Raviv (1991), Rajan and Zingales, (1995), Booth, Aivazian, Demirguc and MakSimovic (2001),Frank and Goyal (2003), Sorgorb-Mira (2005), Frank and Goyal (2009), Akbar & Bhutton (2012), Sheikh and Wang (2011), Chechet et'al (2013), Ajao and Ema (2013), Ashraf and Rasool (2013) Akinyomi and Olagunju (2013) and Onaolapo, Kajola and Nwidobie (2015). Aggregately put, firm's specific factors, industry factors and macroeconomic factors were found to have influence on capital structure choices. However, the inconclusiveness of the underpinning theories and findings of relevant extant empirical literature calls for further empirical investigation. For instance, the pecking order theory predicts a negative relation between firm profitability and capital structure while the trade-off theory predicts a positive relationship between the same variables.

In addition, different methodologies and proxies so far used in studying capital structure and its determinants leave some gaps to fill. As noted by Rajan and Zingales (1995), identifying more accurate proxies will strengthen the relationship between theoretical models and empirical specifications. The main area of concern here is capital structure definitions by different authors.Some studies used total debt (for example: Eritios, 2007; Wanrapee, 2009; Sheik

&Wang, 2011; Ajao & Ema, 2012; Akinyomi & Olagunju, 2013; Saleem, Rafique, Mehmood, (2013).Others used long term debt (Shehu, 2011; Ali, 2011; Chandrasekharan, 2012; and Chechet et al, 2013) to quantify the amount of debt in the capital structure. However, some studies decomposed debt into total debt, long term debt and short term debt.Notable among this strand of studies are: Booth *et al* (2001), Abor (2008), Salawu and Agboola (2008), Kinde (2013) and Onaolapo *et al* (2015). The aforementioned studies used book leverage ratio in their methodological approach to leverage measurements. An interrogation of this proxy reveals the superiority of market leverage due largely to its economic and statistical importance. In addition, the studies that use market leverage (such as; Mitto & Zhang, 2008; Frank & Goyal, 2009and Ovtchinnikov, 2010) are all based in advanced economies; no such studies are found in the emerging economies especially Nigeria. Hence, a methodological cum empirical gap in Nigeria.

Different methodologies have been used in the literature mainly because no single theoryadequately explains capital structure determinants.Thisgives researchers the liberty to justifiably choose a relevant theory to underpin their studies. Rajan and Zingales (1995) emphasized the need to identify the fundamental determinants of capital structure to facilitate harmonization of the existing capital structure theories. Thus, Frank and Goyal (2009),in their investigation of factors that determine capital structure decisions, established ‘six core factors’. These are: median industry leverage, market-to-book asset ratio, tangibility, profits, size and expected inflation.

Frank and Goyal (2009) used different proxies for determinants of capital structure and alternative capital structure measurements (both book and market measures of capital structure, although emphasis was laid on market measurement) in testing their relationships before arriving at the six core factors. However, these core factors were developed based on the study of public traded American firms. Thus, carrying out such a study in a developing economy like Nigeria is necessary to facilitate a comparison of empirical findingsin different geographies of different economic status.Though the findings from relevant literaturesuggest that the insights from modern finance theories could be applied across countries, but sensitivity to differing institutional factors remains a relevant issue (Rajan & Zingales, 1995 and Booth *etal*. 2001). In the same vein, Rajan and Zingales (1995) noted that the possible impact of different institutional factors on capital structure choice cannot be appreciated until emphasis is laid on the actual determinants of capital structure across countries. Rajan and Zingales also emphasized that incorporating the peculiar factors of capital structure enhances the validity of findings on the possible impact of institutional environments. The frontiers of the relevant literature known to the researcher suggest that no study in Nigeria has explored the determinants of capital structure that are reliably important to facilitate the understanding of the institutional factors as suggested by Rajan and Zingales (1995).

Furthermore, there exist a good number of studies on the determinants of capital structure in Nigeria but firm liquidity has so far received scanty attention. That firms in Nigeria use more short term debt in their financing choice (Salawu & Agboola, 2008 and Onaolapo *etal*, 2015)necessitates an investigation of liquidity-capital structure nexus in Nigeria. Onaolapo *etal* (2015) also noted that categorizing firms according to business sectors is necessary in order to deepen the understanding of capital structure determination of specific sectors. Therefore, this study will add liquidity and also introduce expected inflation and median industry leverage as control variables on the capital choice of the downstream oil and gas business sector.

However, the downstream oil and gas sub sector has been partially deregulated which has prompted the need to study the sector. This is because deregulation is an economic shock that considerably affects the operating environment of firms.So,it is pertinent to evaluate the reaction of capital structure to such a shock (Ovtchinnikov, 2010). To exemplify further, the recent economic challengesfacing Nigeria in the forms of dwindling crude volume and low oil prices, security frailties, rising inflation and the associated financial costs have taken their tolls on investors' confidence and companies' performance.(Egene, 2016).

Motivated by the foregoing, this study seeks to examine firm characteristics and capital structure of listed oil and gas firms in Nigeria. Market based methodology is adopted as a justified departure from the previous studies within the Nigerian context. As noted earlier, Nigerian studies on capital structure based their measurement on book leverage which is believed to; produce results which are comparable to other results on capital structure, be in conformity with theoretical predictions and capture the value of assetsin place (Magwai, 2014). It is worthy ofnote thatbook leverage overstates the proportion of a firm's debt that is used to finance its assets since there is no room for current value of the firm. This thereby makes potential investors and lenders to be wary of committing their funds into a company with a high debt/equity ratio. However, the market leverage which is a modification of the traditional book leverage has the potential of boosting investors' and creditors' confidence as it reflects the growth options reflected in the current market valuesagainst value of assets in place (book value). It thus serves as a better measure of solvency.In sum, the steps taken so far are hoped to minimize the seeming inconsistencies amongst the existing theories on capital structure.

1.3 Research Questions

The problem statement raises the following research questions:

1. How doesfirm's profitability affect the capital structure of listed oil and gas companies in Nigeria?
2. To what extent does firm growth influence the capital structure of listed oil and gas companies in Nigeria?
3. What effect does asset tangibility have on capital structure of listed oil and gas companies in Nigeria?
4. What is the relationship between firm's liquidity and the capital structure of listed oil and gas companies in Nigeria?
5. What is the impact of firm size on capital structure of listed oil and gas companies in Nigeria?

1.4 Objectives of the Study

The main objective of the study is to examine empirically the determinants of capital structure of listed oil and gas firms in Nigeria. Hence, the following constitute the specific objectives of the study:

i. To examine howfirm's profitability affects capital structure of listed oil and gas firms in Nigeria;

ii. To investigate the extent to which firm's growth influence capital structure of listed oil and gas firms in Nigeria;

iii. To ascertain the effect of assets tangibility on capital structure of listed oil and gas firms in Nigeria;

iv. To assess the relationship between liquidity and capital structure of listed oil and gas firms in Nigeria; and

v. To evaluate the impact of firm size on capital structure of listed oil and gas firms in Nigeria.

1.5 Research Hypotheses

The study sets out to test the following hypothesesbased onthe objectives of the study:

H_{01}: Profitability does not significantly affect capital structure of listed oil and gas firms in Nigeria

H_{02}:Growth opportunity has no significant influenceon capital structure of listed oil and gas firms in Nigeria

H_{03}: Asset tangibility has no significant effect on capital structure of listed oil and gas firms in Nigeria

H_{04}: Liquidity has no significant effect on capital structure of listed oil and gas firms in Nigeria**.**

H_{05}: Firm size has no significant impacton capital structure of listed oil and gas firms in Nigeria**.**

1.6 Scope of the Study

This study investigates the factors that influence capital structure of listed oil and gas companies in Nigeria. The study focuses on five (5)firm characteristics as determinants, namely profitability, firm growth, assets tangibility, liquidity and firm size. The roles of these factors are assessed against the choice of debt or equity in the capital structure decisions of an organization. This is to ascertain the extent to which capital structure determinants facilitate the choice of optimal capital structure vis a vis the overall objective of a firm (that is, wealth maximization).

The study spansa period of 11 years from 2006 to 2016 (both years inclusive). This period witnessed the partial deregulation of the downstream oil and gas sub sector in 2014. This reform led to growth and expansion in the sector, thereby informing the need to assess the factors of capital structure of firms in this sub sector. That is, this study covers only a sub sector of the oil and gas sector in Nigeria – the downstream sector.

The sampled firms were the listed firms that submitted their annual reports consistently within the period being studied.

1.7 Significance of the Study

The dynamic political, economic, technological and legal environments in which firms exist inform the evolving capital structure choice determination.This justifies a never-endinganalysis of capital structure.However, previous studies on capital structure in Nigeria mainly focused on leverage using book value, whereas market leverage (debt divided by sum of the book debt and market value of equity) as it facilitates informed forward-looking financing decisions based on the prevailing market conditions.Hence, the choice of market leverage as acapital structure measurement for firms in Nigeria.

To this end, market leverage as used in this study will undoubtedly serve as a guide to managers on the choice of capital structure determinants that best maximize the firm's value. This is true as market leverage informs managers on the financial position of the firm. It will also assist existing and potential investors on the look-out for the firm's characteristics that help to maintain an optimal capital structure in the long run. Government and regulatory agencies will be guided by the findings of the study on the design, implementation and enforcement of policies, rules and regulations capable of boosting firm performance and revenues for government. Also, a study of this nature strives to extend the frontiers of the debate on firms' financial-mix choice,thereby leaving further researches in this area better informed.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews relevant conceptual, theoretical and empirical literature, and provides the theoretical framework that underpins the study. The aim is to interrogate the contributions of previous researchers for possible gaps with a view to filling them. The chapter begins by doing a systematic review of the concepts of capital structure and relevant firm characteristics as well as their measurements. It also provides a review of empirical literature on the relationship between each of the firm characteristics as used in the study and capital structure. Finally, a theoretical framework is developed to capture the focus of the research.

2.2Concept of Capital Structure

Despite the numerous studies on capital structure, the concept defies a single definition that enjoys general acceptability. Capital structure and the associated terms, such as financial leverage and gearing are often mistakenly used interchangeably. According to Julia (2013), the discrepancies mainly stem from treatment of debt. Julia (2013) sums the various interpretations of debt available in literature into four approaches.

The first approach views capital structure as the proportion of total debt and equity (Masulis, 1988; Rajan and Zingales, 1995; Booth *et al*, 2001; Olakunle and Oni, 2014 and Martina, 2015). The second approach sees capital structure as the fixed capital in an organisation, that is, the relationship between long term debt and equity (Frank & Goyal, 2008; Ajao & Ema, 2012 and Kinde, 2013). The third approach sees capital structure as the issued securities (Brealey & Myers, 1999). The fourth approach includes only the shareholder’s equity and those components of capital the use of which entails incurring interest expenses by the company (Ross, Westerfield & Jafle, 1990).

However, Julia (2013) opined that regardless of the conceptual view of capital structure, capital structure ratios help to assess the use of debt and equity in financing business assets, as well as to evaluate liabilities in the long run. Thus, the measure of capital structure can be divided into two main groups: measures based on market value of equity (usually defined as the number of shares outstanding divided by the market price of shares on the last day of the year) and measures based on book value. Opinions vary as to whether the market based approach is more appropriate compared to the book-based measure of capital structure. This, however, has led to studies using book leverage (debt divided by total assets) or market leverage (debt divided by sum of book debt and the market value of equity) in the quest for empirical assessment of these theories (Frank & Goyal, 2009).

Early empirical studies tend to focus on book leverage but more recent literature has given more attention to market based measure of leverage (Frank & Goyal, 2009). The use of book leverage is justified by Graham and Harvey (2001), who argue that managers use this measure in determining the financial structure. In addition, Barclay, Smith and Watt (2003) show that book values of leverage are theoretically better in the regression of leverage, as the denominator of some market value ratios may show false correlation with some of the explanatory variables, such as the Tobin's q ratio.

Fama and French (2002) and Welch (2004) oppose the use of book value due to the reportedly striking differences of the results obtained for book value and market value of leverage. They argue that the book value of equity is primarily a 'plug number' used to balance the left-hand side and the right-hand side of the balance sheet rather than some managerially relevant numbers. Welch (2004) also objects that book value of equity can even be negative (although assets cannot be). The book is backward looking, it measures what has taken place while markets are generally assumed to be forward looking. So there is no reason why this measure should match (Barclay, Morellec & Smith, 2006).

Due to the different approaches to capital structure definitions and measurements as noted above, Julia (2013) opined that, capital structure measurements should depend on the purpose of the analysis bearing in mind the effect of corporate financial decisions. These decisions are probably best represented by the relationship of total debt and total capital employed, as defined by Rajan and Zingales (1995) – the sum of equity and total debt.

This study sees capital structure as the ratio of debt to total assets. This is because this debt ratio focuses on the relationship of debt liabilities as a component of a firm's total asset based. Debt includes all short term and long term obligations. It should however be noted that market definition of leverage as given by Frank and Goyal (2009), Mitto and Zhang (2008) and Ovtchinnikov (2010) is adopted for this study. Therefore, market leverage is defined and measured as the ratio of total debt divided by market value of asset (MVA) in line with definition given by the above authors. MVA is equal to total debt divided by market value of equity (price x outstanding shares) plus book value of long term debt and short term debt plus preferred stock. However, Dhingra and Dev (2016) observed that, the examination of total debt ratio may generate results which are difficult to interpret due to the inclusion of trade credits in the amount of short term debt. Therefore, another leverage measure is considered. That is the measure based on long term liabilities proportion in the capital structure.

2.2.1 Factors that Influence Capital Structure Decisions

Whether a firm is financed by debt or equity or a combination of both bears some implications.Therefore,the need for cost minimizing choice arises – an option that is justifiably viewed as the optimal capital structure mix. An optimal capital mix is one that not only maintains the stability but also enhances the firm's wealth (Morris & Beretta, 2008). Firms should first analyse a number of factors, then establish a target capital structure. The target may change over time as conditions change, but at any given moment, management should have specific capital structure in mind. Brigham& Houston (2013) highlighted four primary factors that influence capital structure decisions. These are: Business Risk, Tax Position, Financial Flexibility and managerial Conservatism or Aggressiveness.

2.2.1.1 BusinessRisk: This is the hazard inherent in the firm's operations if it uses no debt.The greater the firm's business risk, the lower its optimal debt ratio. According to pecking order theory and trade off theory, volatility is considered to be either the inherent business risk in the operation of a firm or a result of inefficient management practices (Brigham and Houston, 2013). In either case, earning volatility is a proxy for the probability of financial distress and the firm will have to pay risk premium to an external fund holder. Booth *etal* (2001) find out that business risk has a negative relation with leverage.

2.2.1.2 TaxPosition: The firm's tax position is one of the major reasons for using debt.This is because interest is tax deductible, thereby lowering the effective cost of debt. However, if most of a firm's income is already sheltered from taxes by depreciation tax shield, by interest on currently outstanding debt, or by tax loss carry-forwards; its tax rate will be low.So,additional debt will not be as advantageous as it would be to a firm with higher effective tax rate (Brigham and Houston, 2013).

According to the trade-off theory of debt, a firm will borrow up to the point where the marginal value of tax shields on additional debt is balanced by increasing the present value of possible bankruptcy costs (Myers, 2001). Although, when excessive amount of debt is accumulated by the firm, its default risks will result in the transfer of control to the creditors and also, excessive debt may incur deadweight costs which further reduce firm value (Frank and Goyal, 2008).

2.2.1.3 FinancialFlexibility: This is the ability to raise capital on reasonable terms under adverse conditions. Financial flexibility refers to the ability of a business entity to adopt effective measures to change the amount and time of cash flow in a way that enables the entity to respond to unexpected events and opportunities (Clarc, 2010). More specifically, Byoun (2008) sees financial flexibility as a degree of a firm's capacity which would enable it to mobilize resources for response activities in order to increase firm's value to a maximum value. Therefore, corporate treasurers know that a steady supply of capital is necessary for stable operations, which is vital for long-run success. So, a commercial firm needs financial flexibility in practice when expectations had not been met or unexpected occurrences had occurred (Byoun, 2011)

2.2.1.4 Managerial Conservatism or Aggressiveness: Some managers are more aggressive than others.Hence,some firms are more inclined to using debt in an effort to boost profits. This factor does not affect the true optimal, or value-maximising, capital structure, but it does influence the manager-determined target capital structure (Brigham and Houston, 2013).

2.3 Firm Characteristics

Firm characteristics such as firm profitability, firm growth, asset tangibility, firm liquidity and firm size are identified by some studies as important determinants of capital structure. These variables are discussed hereunder.

2.3.1Firm Profitability:Profitability is a measure of earning power of a firm. The earning power of a firm is the basic concern of its shareholders. A company that is not making profits may find it difficult to obtain loan. It is argued by Harris and Raviv (1991) that companies with strong financial position have relatively easier access to cheaper credit facilities and hence invest more. Also, Frank and Goyal (2009) posit that profitable firms face lower expected cost of financial distress and find interest tax shields more valuable. More so,as noted by Booth *et al* (2001), highly profitable firms might have the ability to finance their growth by using retained earnings and thereby maintaining a constant debt ratio. On the other hand, less profitable firms will be forced to resort to debt financing.

Profitability is measured in several ways. Chandrasekharan (2012) and Chechet *etal* (2013) both measured profitability as the profit after tax divided by the capital employed. Anupam (2012) measured profitability using three proxies: Return on Equity (ROE) = Net Profit after Preference Dividend/Number of Equity Shares outstanding; Return on Assets (ROA) = Net Profit/Total Assets; and Earnings per Share (EPS) = Net Profit/ Number of Equity shares outstanding. The successive profitability levels of a firm, and hence the amount of earnings to be retained, is be an important determinant of capital structure. This study therefore utilizes the ratio of operating income to total assets, that is, return on assets as earnings before tax divided by total assets as a measure of profitability(Booth *et al*, 2001). This is because ROA ratio is an indicator of how the uses its assets to generate earnings. It also represents the earning power of the company with regard to revenue generated from ongoing operations.

2.3.2 Firm Growth: Growth opportunities are viewed as intangible assets of firm. That a firm has significant future growth opportunities hardly reduces the difficulties the firm faces in raising finance from debt market because intangible assets are considered as not fully collaterallizable. Thus, Fama & French (2002) opined that, firms with high growth opportunities will use more of equity rather than debt in their capital structure. On the other hand, Um (2001) argues that growing companies' funding pressure for investment opportunities is likely to exceed their retained earnings and is likely to choose debt rather than equity.

Titman and Wessels (1988) used annual percentage increase in total assets as a measure of growth. Salawu and Agboola (2008) defined growth opportunity as Total Assets in year (t) divided by Total Assets in year (t-1). However, Shehu (2011) defined growth as the percentage increase in the net total assets. On the other hand, Frank and Goyal (2009) posit that the market-to book asset ratio is the most reliable measurement for growth opportunities. Therefore, this study adopts the definition posited by Frank and Goyal (2009). This definition is adopted because it recognises the present worth of the company since investors and potential investors are more interested in the current value of a business.

2.3.3AssetTangibility: Tangible assets of a firm such as property, plant and equipment can be considered as the representatives of real guarantee to creditors. Therefore, the importance of those assets among total assets influences its level of debt. As noted by Koksal and Orman (2015), tangible assets are likely to have an impact on the borrowing decisions of a firm because they are less subjected to informational asymmetries and they have values greater than those of intangible assets in case of bankruptcy. In addition, the moral hazard risks are reduced when the firm offers tangible assets as collateral, because this constitutes a more reliable surety to the creditors in the case of default. As such, tangible assets constitute sound collateral for loans. Therefore, the greater the proportion of tangible assets on the balance sheet (fixed assets divided by total assets), the more willing lenders would be to supply loans, and the higher the leverage. (Rajan & Zingale, 1995). Tangibility is then defined as the ratio of firm's fixed assets to total asset. Thus, asset tangibility is considered as a proxy for collaterals. (Rajan & Zingales, 1995;Booth *etal*, 2001; and Butt, 2016).

However, Frank and Goyal (2009) posit some alternative definitions of tangibility such as Research and Development (R&D) expenses (defined as R&D expenses/sales) and Selling, General and Administrative (SG&A) expenses (measured as SG&A expenses/sales ratio). An analogous prediction is that firms making large discretionary expenditure such as (R&D) expenses and (SG&A) expenses have more intangible assets and consequently less debt. This therefore adopts the definitions of asset tangibility given by the aforementioned authors which equates Asset Tangibility to: total assets minus current assets divided by total assets. This is because oil and gas firms expend huge amount on non-current assets compared to service firms in which other definition may be more appropriate.

2.3.4Liquidity: Liquidity is another variable whose importance is worthy of emphasis in the financial decision making process of any business organization whose aim is to make profit and maximize the wealth of the shareholders. Liquidity is the ability of a company to meet its short-term obligations.So, the higher the liquidity of a company, the better it is able to pay the debt interests. A company with high liquidity can rely on debt as a great contributor to capital structure because it can easily pay its debt (Fama & French, 2005). A company may use liquid assets to finance its activities and investments when the external financing is not forthcoming or is expensive. Similarly, the high liquidity enables a company to deal with the unexpected expenses and to withstand its obligations during periods of low revenues (Ghasemi & Ab Razak, 2016).

The quick, or acid-test, ratio is used to measure liquidity. Ramlall (2009) used the current ratio to measure liquidity and defined liquidity as a measure of current assets over current liabilities. Sharif, Naeem and Khan (2012) also used the current ratio similar to that of Ramlall (2009). On the other hand, Zabri (2012) as well as Ghamesi & Ab Razak (2016) defined liquidity using both quick and acid ratios as thus;

Quick Ratio: (current assets – inventories)/ Total assets, and

Current Ratio: current assets /current liabilities.

These ratios show the ability of the firm to cover its short-term and long term obligations and they measure the liquidity of the firm. It is expected that there will be a negative relation between the debt ratio of the firm and its liquidity simply because the more debt the firm uses the more current liabilities this will imply and the fewer current assets will remain after dealing with the liabilities. This study shall use the current ratio in line with the above authors. Although the quick ratio is a measure that further refined current ratio by measuring only the most liquid assets to cover current liabilities. Still, current ratio is adopted for this study because oil and gas inventories are highlyliquid assets.

2.3.5 Firm Size: The size of a firm plays an important role in its capital structure decisions. According to literature, large firms have the following advantage over smaller firms.They are more diversified, have easy access to the capital market, receive higher credit ratings for debt issues, pay lower interest rate on debt capital, have less volatile cash flow, have more dilute ownership, are less prone to bankruptcy and so on (Alkhatib, 2012).

Size is the measure of how large the firm's operational capacity is. Bevan and Danbolt (2002), in support of the Static Trade Off theory, argue that large firms tend to hold more debt, because they are regarded as being "too big to fail" and therefore receive better access to the capital market. Nawaiseh (2015) posits that lenders to larger firms are more likely to get repaid than lenders to smaller firms. Therefore, larger firms will have higher debts. The term firm size is defined by researchers along with the proxies used in measuring it and these measures may impact on capital structure decision differently (Chongyu & Frank, 2015). However Rajan and Zingales, (1995), Booth *et al,* (2001) and Shehu, (2011) defined size as the natural logarithm of sales.Whereas, Frank and Goyal, (2009), Kinde (2013) and Nawaiseh, (2015) used the natural logarithm of total assets as the proxy for size. This study adopts the definition posited by Frank and Goyal (2009),Kinde (2013) and Nawaiseh (2015). This is because their proxy best measures the size of the oil and gas businesses as itconsiders the size of the total resources whereas, the sales-based measure may not capture the actual size of the firms under consideration.

2.4 Empirical Studies on Firm Characteristics and Capital Structure

This section reviews relevant studies on firms' characteristics and capital structure. The effect of these factors and the direction of the results are captured. In relative terms, a number of studies have been conducted on firm's characteristics and capital structure but there is the need to investigate some of the distinguishing characteristics that corporations deal with in determining capital structure particularly the oil and gas firms due to the important role it plays in the Nigerian economy.

2.4.1 Firm Profitability and Capital Structure

There exists an array of studies on the effect of profitability on capital structure. Rajan and Zingales (1995) investigated the determinants of capital structure in the major industrialized countries, the G-7 countries, namely Germany, Italy, UK, The US, France, Japan and Canada. For this purpose, the accounting data and monthly stock prices for four years, from 1987 till 1991 were collected from the International Corporation and Global Vantage.Banking and insurance companies' data were not included in the sample collected as their leverages are affected by government regulations. A cross-sectional basic regression model of leverage was developed and used to analyze the data. They found out that profitability is negatively correlated with leverage which proved that highly profitable firms have less demand for external financing and also strive hard to avoid external financing that is believed to be costly. The study has the problem of currency as it was conducted more than two decades ago. Similarly, that it studied only industrialized countriescalls for a test of the validity of the results in other economic cum institutional climesespecially emerging economies like Nigeria.

Rajan and Zingales (1995) was complemented by Booth *etal* (2001) by examining the determinants of capital structure in developing countries, in other to find out whether the findings would differ according to differences in economic status and institutional structure. In their work, capital structure choices of firms in 10 developing countries were analyzed. The countries were; India, Mexico, Turkey, Pakistan, Zimbabwe, Korea, Thailand, Brazil, Malaysia and Jordan. Cross country comparison was used to test the effect of capital structure theories on financial leverage.Data were sought from the International Finance Corporation, IFC, and the pooled data results indicated that profitability has a negative relationship with the debt ratio of a firm regardless of definitions of debt ratio utilized. The studyportrays that results from developed countries could be valid with respect to developing countries.However, they still confirmed that country's institutional structure and firm's specific factors play important roles in determining capital structure of firms. Despite the extensive scope of the work in terms of number of countries studied, Nigeria and some other developing economies were not captured.

Abor (2008) examined the determinants of capital structure on a sample of listed firms on the Ghana Stock Exchange. Regression analysis was applied to test the relationships between the return on equity and different measures of capital structure. The findings revealed that short-term debt is significantly positively related to total assets and return on equity. Besides, there is negative relation of the ratio of long-term debt to total assets and return on equity. Furthermore, a significantly positive relation of the total debt to total assets ratio and the return on equity is observed. Thus, the study concluded that the higher the profitability of a company, the greater the likelihood of the company choosing debt as its major financing instrument. At this juncture, it is worth stressing that there is no guarantee that the findings of Abor (2008) are valid for Nigeria, despite several similarities between Ghana's economy and Nigeria's.

Salawu and Agboola (2008) examined determinants of capital structure using 33 large non-financial firms listed on the Nigerian Stock Exchange for a period of 14 years from 1990-2004. Large firms, according to them, are firms with a minimum of market capitalization of five hundred million.The data used for the study were sought from the sampled firms' annual reports and publications of the Nigerian Stock Exchange. In their study, leverage (based on book value) proxy was decomposed into three different components, namely: Total Debt/Total Assets; Short-term Debt/Total Assets; and Long-term Debt/ Total Assets in other to know how capital structure determinants affect the various compositions of debt ratios. The data were analyzed using regression and profitability (earnings after interest and tax to book value of total assets) was found to be positively associated with long-term debt and total debt. This indicates that large non-financial firms in Nigeria are profitable and are expected to prefer debt to benefit from the tax shield and their work reveals that large firms in Nigeria prefer short-term debt.

Though Salawu and Aboola (2008) investigated the firms listed on the Nigeria Stock Exchange, their measure of profitability is based on earnings after tax. This measure of profitability may not tell how efficiently Nigerian firms use their resources to generate income. Hence, the need to use an alternative measure of profitability such as EBITthat incorporates efficiency.

Igbinosa and Chijuka (2014) analyzed determinants of capital structure of firms listed in the Nigerian stock Exchange for 2013 by using data collected in 2012 from the CBN statistical bulletin and Thomson One Banker. Twenty (20) companies' data were collected and analyzed using cross sectional regression analysis and the result shows a negative and statistically significant relationship between profitability and leverage. This study suffers some shortcomings.Convenient sampling was used to select the sample size, making it a poor representative of the population. More so, only cross sectional data were utilized, leaving out time series. Time series in the study of capital structure enhances the robustness of the model and deepens the understanding of the determinants of capital structure. Cross sectional data as used in the study may not give accurate prediction of return on asset which is net profit/total assets used to proxy profitability and capital structure decisions. Also, the proxy for leverage was long-term debt divided by the book value of assets without giving cognizance to short term debt which also plays an important role in the financing decisions of firms in Nigeria (Salawu and Agboola, 2008).Hence, a reduction in the generalization power of the study. Similar findings were found in the work of Ogbulu and Emene (2012) who also investigated the determinants of corporate capital structure in Nigeria for the year 2008. Although they had a larger sample, the study suffers the same limitations with those of Igbinosa and Chijuka (2014).

The important firm-level determinants of capital structure of insurance companies in Ethiopia were investigated by Kinde (2013). Nine (9) insurance companies were sampled out of twelve (12) due to insufficient data from the whole population. Five-year data were collected from their annual accounts for the period 2004-2010. The data were analyzed using panel data regression analysis. Debt ratio was decomposed into short term debt and long-term debt and fixed effectsand random effectswere tested. The result revealed that profitability is negatively related to long-term debt but positively related to total debt. The negative relationship suggests that as firms become more profitable they tend to utilize internally generated income before considering external sources of finance.The positive relationship shows that as firms become more profitable, they tend to tolerate more short term debt since they are more likely to have more tax burden and low bankruptcy risk. These results may not be generalized to include non-financial sector of an economy since different laws govern them.

Furthermore, Chechet *etal* (2013) assessed the determinants of capital structure in Nigerian Chemical and Paints companies listed in the Nigeria Stock Exchange for a period of five years from 2005 to 2009. Secondary data were collected from the companies' annual reports and the Nigerian Stock Exchange Fact Book for the relevant years of the study. The Ordinary least square (OLS) was employed to analyze the data. The statistical results revealed that the ratio of earnings after tax divided by capital employed and profitability have significant negative impact on the ratio of long term debt to capital employed of the Nigerian Chemical and Paints companies. While this study investigated a business subsector, the results may not be applicable to the oil and gas subsector since firm specific factors play important roles on capital structure decisions.

Similarly in Nigeria, Akinyomi and Olagunju (2013) studied the determinants of capital structure of manufacturing firms listed on the Nigerian Stock Exchange for the period 2003-2012. The sample size for the study comprises 24 randomly selected firms out of the 86 listed manufacturing firms. Data from the sampled firms' annual accounts were analyzed using regression and the results showed that profitability (return on asset) has a positive and insignificant relation to capital structure (total liability divided by total assets) of firms in Nigeria. However, Onaolapo *etal* (2015) investigated the determinants of capital structure of 35 firms listed on the Nigerian Stock Exchange between 2006 and 2012. Ordinary Least Square was used to analyze the data generated from the annual accounts of the sampled firms. The ratio of earnings before tax to total assets was used to measure profitability and three measures of leverages (total debt, long term debt and short term debt ratios) were used to measure capital structure. The findings revealed that profitability has a significant inverse relationship with all the measures of leverage in the study. The result indicates that profitable firms in Nigeria use internally generated funds in the form of retained earnings to finance their investment.

2.4.2 Firm Growth and Capital Structure

There exist various studies conducted on the effect of firm growth on capital structure.Hall, Hutchinson and Michaelas (2004) examined the degree to which determinants of SMEs' capital structure differ amongst European countries. The authors based their data on four thousand incorporated SMEs; five hundred from eight countries: Belgium, Germany, Spain, Ireland, Italy Netherlands, Portugal and the UK. Regression was used to run the relationship between the dependent variable and independent variables. The main feature of the study was to isolate the country-effect from the firm-specific-effect. The results showed that growth is positive and highly significant to short term debt, it also showed a positive and not significant relationship to long-term debt ratio. This study extensively looked at the determinants of capital structure of SMEs whereas the capital structure of SMEs may be different from that of the oil and gas businesses.

Similarly, Sorgorb-Mira (2005) investigated the effect of firm characteristic on non-financial Spanish small and medium enterprises capital structure during a five years period from 1994-1998. Panel data of 6, 482 non-financial Spanish SMEs were collected for the study. Multiple regression was used to test the relationship between the dependent and the independent variables. The findingsshowed a stronger positive effect on long-term debt, but a negative impact on short-term debt. On the other hand, Sen and Oruc (2008) basing their study on testing of pecking order theory in Istanbul Stock Exchange market (ISE) reported that, no meaningful relation was detected for company growth and financial leverage.

Shehu (2011) investigated the determinants of capital structure of insurance firms listed on the Nigerian Stock Exchange for a period of 10 years covering 2001-2010. Secondary data were sought from the annual accounts of the 15 sampled firms. Using multiple regression analysis to test the hypothesis formulated, the result indicated a positive significant relationship between growth (measured as % increase in Net Total Asset) and leverage. Leverage was measured in the study as book value of long term debt divided by capital employed (long term debt plus shareholders fund). A similar study needs to be extended to non-financial sector of the economy using an alternative measure of growth.

However, Sharif, *etal* (2012) explored the factors that determine capital structure in insurance companies of Pakistan. Panel data of 31 insurance firms were collected for the period 2004 to 2009. Fixed and random effects models were estimated as econometric panel data techniques for the study.It was found that growth opportunities measured by the sales figure is not a determinant of capital structure in the insurance sector. In addition,Paydar and Bardai (2012) investigated the leverage behaviour of manufacturing companies in industrial sector, in Bursa Malaysia, using 117 manufacturing companies during a seven-year period from 2004 to 2010. Using multiple regression analysis, the study found that growth has insignificant effect on leverage ratio.The findings of these studies may not hold for oil and gas sector given the institutional and operational peculiarities compared to insurance, a subsector of financial sector.

Chandrasekharan (2012) investigated the potential determinants of capital structure of listed firms in Nigeria for a period of ten years from 2007 to 2011. Convenience sampling technique was used to draw a sample of 87 firms out of the 216 firms registered as at 31st December, 2011. Panel multiple regression was employed to test hypothesized relationships amongst the variables the result showed a positive significant relationship between, percentage increase in net total assets, growth and leverage (long term debt/capital employed). On the other hand, Onaolapo *etal* (2015) also examined the determinants of capital structure of quoted companies in Nigeria beginning from 2006 to 2012. The data gathered from the annual financial statements of the sampled firms were analyzed using regression and the result showed that growth measured as the change in log of assets does not determine corporate capital structure in Nigeria. The contradiction observed from the above studies may have resulted from the proxies used for growth.

Arabzadeh and Meghaminejad (2012) appliedregression and correlationin the analysis of 52 companies sampled out of companies listed at Tehran Stock Exchange. They found that growth is positively related to financial leverage. This does not conformto apriori expectation as it was assumed that higher growth is associated with lower leverage. The seeming inconsistencies in these studies may be due to different growth measurements used and also the presence of country-specific institutional factors. In order to deepen the robustness of the extant literature, this study uses a different measure (market to book measure) in a distinct business sub sector (the Nigerian oil and gas sector).

However, Saleem, Rafique, Mehmood Irfan, Saleem, Tariq, and Akram (2013)examined the determinants of capital structure in oil and gas firms listed on Karachi Stock Exchange of Pakistan for the period of 2006 to 2011. A sample of twelve (12) oil and gas companies listed on Karachi Stock Exchange was selected for the study based on non-probability, convenient sampling technique. The study utilizesdata of different variables for the period 2006-2011 to examine the relationships. Multiple regression technique was used to analyze the relationship between dependent variable (Leverage) and independent variables (Firm Size, Tangibility of Assets, Profitability, and Sales Growth). The results showed that sales growth, measured as the annual percentage changes in total assets, have negative relationship with leverage (total debt/total assets). It was also found that internally generated funds may not be sufficient for growing firms and debt financing may be the only option for further growth. Even though the study shares similarity of sectoral focus (oil and gas sector) with this study, it would not be out of place to replicate the study in a different clime such as Nigeria so as to investigate the sensitivity of the results to institutional peculiarities. However, a different proxy for growth is considered.

2.4.3 Asset Tangibility and Capital Structure

A number of studies have investigated the relationship between asset tangibility and capital structure. Wanrapee (2009) examined the determinants of capital structure of 81 randomly selected Thai companies from six industries listed on the Sock Exchange of Thailand. Secondary data were obtained from the audited annual accounts of the selected firms during 2004-2008 periods. The analysis was carried out using correlation and regression analysis. After controlling for industry, the results revealed a significant negative relationship between tangibility (the ratio of fixed assets to total assets) and debt ratio (total debt divided by total assets).This indicates that companies with high proportion of fixed assets to total assets issue less debt. However, the current study extended this work by using just a business sector so as to give a better understanding of capital structure decisions.

In addition, Khrawish and Khraiwesh (2010) investigated the capital structure of listed industrial companies on Amman Stock Exchange (ASE) over the period (2001-2005). Thirty (30) companies were selected after meeting some criteria for selection into the sample. Regression analysis was conducted using ordinary least square technique and the findings revealed a significant positive relationship between Tangibility of the firm and long term debt (LTD)/total debt (TD). This relationship is due to the fact that firms with high levels of tangible assets have greater capacity to provide collateral for debts. So the companies with high levels of tangible assets are less likely to default and will take on relatively more debt resulting in a positive relationship between LTD / TD and Tangibility.

Shehu (2011) investigated the determinants of capital structure of insurance firms listed on the Nigerian Stock Exchange for a period of 10 years spanning 2001-2010. Secondary data were sought from the annual accounts of the 15 sampled firms. Using multiple regression analysis to test the hypothesis formulated, the result indicated a positive significant relationship between tangibility (fixed assets divided by net total assets) and leverage. Leverage was measured in the study as book value of long term debt divided by capital employed (long term debt plus shareholders fund). Even though the result revealed a significant positive relation between tangibility and leverage, the proxy for tangibility may not be applicable to this study.Since insurance companies are service firms, they may not hold large amount of fixed assets compared to oil and gas firms. Hence, the results may not be generalizable to include non-financial firms in Nigeria.

However, Sheikh and Wang (2011) examined the factors that affect capital structure of manufacturing firms in Pakistan. The study set out to examine whether the capital structure models derived from developed economies provide persuasive explanations for capital structure decisions in the selected Pakistani firms. The investigation was conducted using panel data procedures for a sample of 160 firms listed on the Karachi Stock Exchange during 2003-2007. The results revealed that there is a negative relationship between debt ratio (as the dependent variable) and tangibility (as independent variable). The study concluded that capital structure models derived from advanced economies assist in understanding the financing behaviour of firms in Pakistan.

Similarly, Akinyomi and Olagunju (2013) explore the determinants of capital structure of 86 manufacturing firms listed on the Nigerian Stock Exchange for a 10-year period from 2003 to 2012. The audited annual reports of twenty-four (24) randomly selected manufacturing firms were used for the study. The data were analyzed using correlation coefficient and regression analysis and the result reveals that tangibility (measured as the ratio of average total fixed assets to total assets) is positively and significantly related to leverage (total liabilities divided by total assets). This suggests that the manufacturing firms in the Nigerian economy have a large amount of fixed asset and consequently use more debt.

Chechet *etal* (2013) assessed the determinants of capital structure in Nigerian Chemical and Paints companies listed in the Nigeria Stock Exchange for a period of five years from 2005 to 2009. Secondary data were collected from the companies' annual reports and the Nigerian Stock Exchange Fact Book for the relevant years. Ordinary least square (OLS) was employed to analyze the data. The statistical result revealed that, the ratio of tangibility had a significant negative impact on the ratio of long term debt to capital employed of the Nigerian Chemical and Paints companies. While this study investigated a business subsector, the results may not be applicable to the oil and gas subsector since firm specific factors play an important role on capital structure decisions.

Onaolapo, *etal* (2015) investigated the determinants of corporate capital structure of 35 out of the 216 firms listed on the Nigerian Stock Exchange between 2006 and 2012. Panel data methodology was employed and pooled Ordinary Least Squares (OLS) wasused to estimate the coefficients of six firm-specific determinants. The results revealed that the three leverage ratios (Total Leverage Ratio, Long-Term Leverage Ratio and Short-Term Leverage Ratio) and asset tangibility were positively and significantly related to leverage.

Koksal and Orman (2015) examined the determinants of capital structure choice of a major developing country, Turkey. Asset tangibility was found to have a significant positive effect on long term debt but negative and insignificant for short term debt. The study also revealed that tangibility is a very strong determinant of capital mix of Turkish firms and trade off theory better describes the capital structure of Turkish firms.

2.4.4 Liquidity and Capital Structure

There exist various studies conducted on the impact of firm liquidity on capital structure.Ramlall (2009) explored the determinants of capital structure of the non-listed non-financial firms in Mauritius. Data was gleaned from the Registrar of Companies in Mauritius for about 450 firms for the period 2005-2006. Some criteria were set for the sample selection and the 395 firms that met the criteria were therefore included in the sample. Regression model was developed and used to run the data which revealed that liquidity is negatively related to leverage. However, current assets divided by current liabilities was used to measure liability and book leverage of short term debt and long term debt measurements were used. Although large sample size was employed for the study, the time frame chosen may not adequately guide decisions on capital structure.

Ebadi, Thim and Choong (2011) studied the impact of company characteristics on capital structure in Iran. The study was done using a panel data of 72 Iranian companies listed on the Tehran Stock Exchange from 2003 to 2009. Findings indicated that liquidity is negatively related to debt ratio. Also in Malaysia, Zabri (2012) examined the determinants of capital structure among SMEs. Forty-seven (47)out of Fifty (50) SMEs were selected from the list of award winners in Malaysia from 1998 to 2010. The study used primary data collected with the aid of structured questionnaire.The data were analyzed using descriptive, bivariate, and multivariate analyses and the result showed that liquidity (both quick and current ratios) has a negative relation with debt ratio. The use of both quick and current ratios give a better understanding on how healthy a company is. Since quick ratio is more conservative as a measure of liquidity.

Sharif, Naeem and Khan (2012) investigated firm characteristics and capital structure of quoted insurance companies in Pakistan. Panel data of 31 insurance companies were collected and

Hausman specification test was used to analyze the data. The result indicated an inverse but insignificant relationship between liquidity (the ratio of current assets to current liabilities) and debt ratio. They argued that the non-significance stemmed from the possibility that insurance companies faced more liquidity risk as compared with other financial institutions, as they receive premium in installments but areobliged to pay claims in bulk amount. The result from the study cannot be used as the basis for capital structure decisions of non-financial firms.

Shala, Ahmeti, Berisha and Perjuci (2014) investigated the factors that may affect the decisions on capital structure of insurance sector in Kosovo. Information used was gleaned from financial statements retrieved from the website of Central Bank of Kosovo for a period of three years (2009-2012) for ten general insurance companies and one life assurance company. The hypotheses formulated are tested using regression analysis and the empirical result shows a positive insignificant relationship between liquidity and debt ratio, indicating that liquidity (short term assets over short term liabilities) is not considered an appropriate determinant of leverage (total debt over total assets). The result here cannot be generalized to non-financial companies since the rules and regulations governing them are not the same.

Ghasemi and Razak (2016) also confirmed the effects of firm liquidity on capital structure. The study explored the impact of liquidity on capital structure of listed Malaysian firms for the period from 2005 to 2013 using 300 randomly selected firms based on some criteria. To achieve the objective of the study, two measures of liquidity (current and quick ratios) were used as part of the independent variables. However, three measures of leverage (debt /equity) were adopted as the dependent variable of the study. These are total debt, long term debt and short term debt. Pooled OLS was used to investigate the relationship between the independent and the dependent variables and the result revealed a significant negative relationship between current ratio and leverage, while a significant positive relation exists between quick ratio and leverage measures. The findings further revealed that short term debt is more influenced by liquidity compared to long term debt.

2.4.5 Firm Size and Capital Structure

Studies such as Eriotis (2007) attempted to isolate the firm characteristics that affect capital structure in 129 Greek companies listed on the Athens Stock Exchange during 1997- 2001. The investigation was performed using panel data procedure to analyze data from the sampled firms.In their computations, the total model, the fixed effects model and the random effects model were considered. The debt ratio was expressed as total liabilities divided by total assets and it includes ratio both long-term and short-term liabilities mainly because Greek firms use either very little or no long-term debt capital at all. According to the results, the size of a firm which is measured by the sales figure is positively related to the debt ratio. Thus, indicating that larger firms employ more debt capital in comparison with smaller firms in Greek.

Ali (2011) uses panel data set over the period of five years (2006 to 2010) to investigate the link between leverage and firm specific factors of 170 Indian textile companies listed on the Bombay Stock Exchange. He employed redundant fixed effects tests, which was the most appropriate model to test the null hypothesis of no fixed effects in the cross sectional and time series data of his study. The result revealed a positive relationship between natural log of total assets, the firm size proxy and leverage (long term debt to assets). This was consistent with trade off theory and the findings of Rajan and Zingales (1995) indicating that large textile firms in India use more debt compared to small firms. The work investigated only the determinants of long term debts without looking into other factors such as short term debts and total debts. This shortcoming most likely reduces the robustness of the result.

Thomas, Chenuos and Biwott (2014) examined the factors determining capital structure of 238 Kenyan firms listed in the Nairobi Securities Exchange for the period of year 2006 to 2012. A total of 60 firms formed the sample of the study and 14 commercial banks were later excluded from the sample size because they did not have current assets or current liabilities in their financial records. Panel data were collected from the annual reports of Nairobi Securities Exchange and the Balance Sheet Analysis of Joint Stock Companies listed on the Nairobi Securities Exchange. Multiple regression analysis was used to test the hypothesis and the findings indicated that firm size (natural log of total assets) was positively but non-significantly correlated with the ratio of debt to equity (capital structure). However, Kurshev and Strebulaev (2015) theoretically investigated the cross sectional relationship between firm size (measured as the natural logarithm of the sum of the book value of debtand market equity) and market leverage (debt divided by book debt plus market equity), that firm size was strongly andpositively related to capital structure. This finding contradicts those of Thomas, Chenuos and Biwott (2014). The contradictionsmay have stemmed from the measure of capital structure. While the former used book leverage the latter used market leverage.

Onaolapo, *etal* (2015) investigated the determinants of corporate capital structure of 35 out of the 216 firms listed on the Nigerian Stock Exchange between 2006 and 2012. Panel data methodology was employed and pooled OLS used to estimate the coefficients of six firm-specific determinants. Results revealed that the three leverage ratios (Total Leverage Ratio, Long-Term Leverage Ratio and Short-Term Leverage Ratio) and firm size is positive and significantly related to leverage. On the other hand, Ikechukwu and Madubuko (2016) examined the effect of firm size on corporate borrowing in Nigeria oil and gas industry for the period 2000 to 2014. A simple regression model was developed and used to analyze the data.The result suggested a significant negative relationship between firm size and financial leverage. The result contradicts most of the reviewed studies; this may be due to the definition of leverage in the work. Leverage was measured by the ratio of total debt to the number of outstanding shares while the natural log of total assets was used to measure firm size.

2.5 Theoretical Framework

Several theories provide some explanations for choice of capital structure (Frank & Goyal 2008). Many of these theories have been used in the literature to underpin relationships between firm characteristics and leverage. These theories include: Perking order theory, market timing, agency cost theory and trade-off theory. These theories evolved from the seminal work of Modigliani and Miller (1958) where it was argued that capital structure is irrelevant for firm's value. Their argument was based on strict perfect market competition based on the following assumptions; absence of corporate and personal taxes, zero transaction costs, symmetric information, complete contracting, and complete market. Under these assumptions, the internal and external fund may be regarded as perfect substitutes for each other.

However, five years later, Modigliani and Miller (1963) relaxed the aforementioned assumptions and included corporate tax in their model arguing that the value of a firm will be enhanced if the level of debt increases. They based their argument on the notion that interest paid is tax deductible and therefore firms will benefit from tax shield when long term debt funding is used to finance their activities. Notwithstanding, the vast stream of literature following Modigliani and Miller has refuted the irrelevance proposition, but views on the drivers of capital structure have yet to reach a consensus.

However, for this research, the pecking order theory and trade-off theory are most relevant. This is due to the fact that this study is considering the influence of capital structure determinant on financing decisions of firms.

2.5.1 The Pecking-Order Theory

The first theory is the pecking-order theory (Myers, 1977 and Myers & Majluf 1984), which builds upon asymmetric information between managers and investors.The information asymmetry may also explain why existing investors do not support new equity financing. The reason is that the new investors may require higher returns to reimburse the risk of their investment and this request dilutes the returns of existing investors, and thus the firm should follow specific hierarchy for financing its assets.

At the outset, the firm utilizes internally produced fund i.e. retained earnings followed by debt and if more funds are required, as a final option, assets are financed by equity capital. Therefore, according to the pecking order hypothesis, firms that are profitable generate high earnings are expected to use less debt capital than those that do not generate high earnings. Firms prefer funding sources with the lowest degree of asymmetric information, since borrowing costs increase when obtaining funds from outside lenders who do not have complete borrower information. The Perking Order Theory implies that firms opt first for internally generated funds (a form of inside equity), then for debt, and only as a last resort, for outside equity. This theory also states that there is no optimal debt-to-equity ratio.

Accordingly, this theory hypothesizes a negative relationship between profitability and leverage in the sense that as firms become more profitable, they would prefer to use fund generated internally because such fund is perceived to be cheaper. Similarly, a negative relationship is expected between firm size and leverage, (Rajan & Zingales, 1995), this is because there is less asymmetrical information about larger firms which will reduce the chances of undervaluation of the new equity issue and would make the large firms to use equity financing. (Akinlo, 2011). This theory also predicts a negative relationship between liquidity and leverage because firms with enough liquidity may use internally available fund to finance investment.

Also, based on the prediction of this theory, a positive relationship is expected from assets tangibility and leverage this is because tangible assets can serve as collaterals and are less subjected to information asymmetries (Onaolapo et al, 2015). Also,holdingprofitabilityfixed, firms with more investment opportunity should accumulate more debt over time.Therefore, a positive relationship between growth opportunity and leverage is predicted (Frank & Goyal, 2009).

2.5.2 The Trade-off Theory

The trade-off theory argues that a firm chooses the optimal capital structure by balancing the tax benefits of debt and the costs of financial distress (Brennan & Schwartz 1978; DeAngelo & Masulis, 1980; and Bradley et al, 1984). It also postulates that a firm will borrow up to the point where the marginal value of tax shields on additional debt is balanced by increasing the present value of possible bankruptcy costs (Myers, 2001). According to the trade-off theory, higher profitability lowers the expected costs of distress.However, firms increase their leverage to take advantage of tax benefits.Therefore, a positive relationship between profitability and leverage is expected.

According to Rajan and Zingales (1995), larger firms tend to be more diversified and fail less often and are expected to incur lower costs in issuing debt or equity.Thus, large firms are expected to hold more debt in their capital structure than small firms. So size may be an inverse proxy for the probability of bankruptcy. As such, a positive relationship is predicted by this theory. The trade-off theory also predicts a positive relation between tangibility and leverage.This is because tangible assets are subject to less information asymmetries and can serve as collateral for debt. However, a negative relationship is predicted between growth opportunities and leverage. It is expected that firms with more investment opportunities have less leverage because they have stronger incentives to avoid under-investment and asset substitution that can arise from stockholder-bondholder agency conflicts. (Salawu & Agboola, 2008).

According to Frank and Goyal (2009), the real value of tax deductions on debt is higher when inflation is expected to be high. Thus, this theory predicts leverage to be positively related to expected inflation. However, a positive relationship exists between leverage and liquidity because higher liquidity ratio can support a relatively higher debt ratio due to greater ability of a firm to satisfy short-term contractual obligations on time (Akinlo, 2011).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research design, population of the study, sampling procedure and design, data collection procedure, technique of data analysis, variables measurement, model specification and justification for the methods and techniques used in examining the firms' characteristics that influence capital structure of sampled firms for the period under study.

3.2 Research Design

The study employed correlational research design and descriptive research design for the purpose of addressing the problem of the research. This is because the research is aimed at investigating the impact of the independent variables; profitability, firm's size, assets tangibility, firm's growth and liquidity on the dependent variable; debt and equity ratio.Correlational research design is a design that reveals the relationship of the variables under investigation. In view of the above relationship, a correlational research design is therefore considered the most appropriate for the study because, the variables are amenable to empirical measurement and verification and also, some previous researches on this subject matter used it.

3.3 Sources and Method of Data Collection

The study used data from secondary sources. This is because the model to be estimated requires the use of data in the form of financial and market information. In this regard, the main source of data of this study consists the financial reports of the companies in the form of statement of comprehensive income and statement of financial position and the Nigeria Stock Exchange Fact Book for the period 2006 – 2016. The data was collected by extracting the required variables manually and measuring them in line with the set variable measurements.

3.4 Population of the Study

The study focused on the oil and gas firms operating in the downstream sector as classified by the Nigerian Stock Exchange and the Corporate Affairs Commission. A total of ten (10) oil and gas firms were quoted on the Nigerian Stock Exchange as at 31st December, 2016. The target population is captured in table 3.1

Table 3.1 Population of Listed Oil and Gas Firms in Nigeria

S/N	COMPANY NAME	YEAR OF LISTING
1	Beco Petroleum Product PLC	2009
2	Conoil PLC	1989
3	Eterna PLC	1998
4	Forte Oil PLC	1978
5	Mobil Oil Nigeria PLC	1991
6	MRS Oil Nigeria PLC	1990
7	Japaul Oil and Maritime Service PLC	1994
8	Oando PLC	1991
9	Total Nigeria PLC	2001
10	Seplat Petroleum Development Company PLC	2014

Source: Nigeria Stock Exchange Fact Book (2017)

Certain criteria were employed in the sampling procedure. These are:

i. A firm must have been listed on the Nigerian stock exchange prior to the year 2006.

ii. A firm must have its shares constantly traded on the floor of the Exchange for the period of the study.

iii. A firm to be selected must be trading on the Nigerian stock exchange as at 31st December, 2016.

Consequent upon the application of the filtering,eight (8) of the ten (10) oil and gas firms met all the criteria and thus, formed the study sample.

3.5 Techniques of Data Analysis

The study used multiple regression technique through the use of Statistic/Data Analysis Software (STATA 13.0) to analyze the panel data on firm’s characteristics and capital structure of listed oil and gas firms in Nigeria. Various options of panel regression were conducted such as OLS regression and robust regression. The study relied on the results given by OLS regression and robust regression for LEV1 andLEV2respectively. Tests for multicollinearity, heteroscedasticityand kdensity test were also run to further diagnose robustness of the results.

3.6 Variables Measurement

The measurement of the dependent and independent variables are provided in table 3.2 below.

Table 3.2

Dependent Variables	**Symbol**	**Measurement**	**Source**
Leverage1	LEV1	Total Debt/ Market Value of Assets	Rajan & Zingales (1995);Booth *etal* (2001) and
Leverage2	LEV2	Long term debt/Market Value of Assets	Rajan & Zingales (1995);Booth *etal* (2001) and Salawu and Agboola (2008), Frank and Goyal (2009)
Independent Variables			
Firm Profitability	PROF	The ratio of earnings before interest, taxes and depreciation to market value of assets.	Bevan and Danbolt; 2002.Booth *etal*(2009)
Firm Growth	GROWTH	Market-to-book ratio	Frank and Goyal (2009)
Asset Tangibility	TAN	Net Fixed assets /total assets.	Frank and Goyal (2009)
Liquidity	LIQUI	The current ratio which is equal to current assets divided by current liabilities	Ramlall (2009)
Firm Size	SIZE	Natural log of total assets	Kinde (2013), Frank and Goyal (2009)
Control Variables			
Expected Inflation	INFLA	Treasury bills rate	Frank and Goyal (2009)

Median industry leverage	INDUSTM	Total debt to market value of assets	Frank and Goyal (2009)

Source: Compiled by researcher (2017)

3.7 Model Specification

Most of the existing empirical studies on capital structure use linear regression techniques with proxies for the determining factors used to explain the variation in leverage ratios across firms(Rajan & Zingales, 1995; Frank & Goyal, 2009; Shehu, 2012 and Onaolapo *etal*, 2015). Panel data regression model is estimated on the relationship between the financial leverage(debt to total assets) and firm characteristics (profitability, growth, tangibility, liquidity and size) of the oil and gas firms listed on the Nigerian stock Exchange.

The technique is used because it combines both regular time series and cross sectional regression with the use of double subscript. It is more efficient in that itallowslarger degree of freedom, more variability and less collinearity. Expected inflation and median industry leverage are seen as reliable factors that determine leverage (Frank & Goyal, 2009). They were thus incorporated into the model as control variables. In addition, the inclusion of relevant control variables reduces the tendency of model mis-specification, since there are other factors apart from firm characteristics that influence capital structure. Hence, including control variables facilitated the normalization of the panel model.

The selection of variables for the model was guided by the relevant theories and existing empirical studies on the subject. Hence, the adoption of a modified version of Frank and Goyal (2009) & Ramlall (2009) was estimated.

The general form of the equation is:

LEVERAGE = Function of (Profitability,Growth, Tangibility,Liquidity, size, expected inflation and median leverage)

The model is therefore specified as follows:

$$LEV_{it} = \beta_0 + \beta_1 PROF_{it} + \beta_2 GROWTH_{it} + \beta_3 TAN_{it} + \beta_4 LIQUI_{it} + \beta_5 SIZE_{it} + \beta_6 INFLA_{it} + \beta_7 INDUSTM_{it} + \varepsilon_{it.}$$

This is decomposed into two models in line with Frank and Goyal (2009):

$$LEV1 = \beta_0 + \beta_1 PROF_{it} + \beta_2 GROWTH_{it} + \beta_3 TAN_{it} + \beta_4 LIQUI_{it} + \beta_5 SIZE_{it} + \beta_6 INFLA_{it} + \beta_7 INDUSTM_{it} + \varepsilon_{it} \ldots\ldots \quad (1)$$

$$LEV2 = \beta_0 + \beta_1 PROF_{it} + \beta_2 GROWTH_{it} + \beta_3 TAN_{it} + \beta_4 LIQUI_{it} + \beta_5 SIZE_{it} + \beta_6 INFLA_{it} + \beta_7 INDUSTM_{it} + \varepsilon_{it} \ldots\ldots \quad (2)$$

Where: LEVit stands for leverage, $\beta_0$beingthe Intercept (Constant) andthe other β_i's are the coefficients of the respective regressors. Similarly, PROF, GROWTH, TAN, LIQUI, SIZE, INFLA, INDUSTM symbolize profitability, growth, tangibility, liquidity, size, expected inflation, median industry leverage respectively. Finally, ε_{it} captures the stochastic disturbance (the error term).

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter begins by presenting the data collected in descriptive statistics and correlation analysis. Following these is a discussion of various diagnostic tests. The chapter ends with the presentation and interpretation of regression results. It is worth mentioning that policy implications of findings arealso highlighted amidst the discussions.

4.2 Descriptive Statistics

Table 4.1 shows the descriptive statistics for the dependent and independent variables of the study.

Table 4.1: Descriptive Statistics of the Variables

Variables	**Min**	**Max**	**Mean**	**Std Dev**	**Sktest prob.**	**N**
Lev1	0.08315	0.9359	0.5566	0.2388	0.0000	88
Lev2	0.0011	0.6792	0.1454	0.1789	0.0000	88
Prof	-0.6399	0.8428	0.8381	0.1491	0.0000	88
Growth	0.0017	0.9617	0.0661	0.1264	0.0000	88
Tan	0.0232	0.8875	0.4061	0.2377	0.0187	88
Liqui	0.2948	4.4746	1.0680	0.5908	0.0000	88
Size	14.7008	20.7098	18.0920	1.1227	0.4090	88
Infla	0.04	0.1427	0.0872	0.0314	0.0009	88
Industm	0.2146	0.8127	0.5413	0.2048	0.0000	88

Source: Descriptive Statistic Results from Stata 13

The first measurement of leverage which is the ratio of total debt to market value of assets ranged from 0.0832 to 0.9359.This implies that amongst the firms and within the study period, there was a firm that recorded lowest value of total debt at 1%, while the highest value for total debt was about 94%. The mean value for total debt to market value of assets was 0.5566 within the study period implying that on average the firms recorded 56%. The standard deviation for total debt to market value of assets was 0.2388 which indicates that the variability about the average total debt ratio of listed oil and gas companies in Nigeria. The joint p-value of skewness and kurtosis is significant at 1% which implies the data were not normally distributed.

The second measure of leverage (lev2) which is ratio of long term debt to market value of assets displayed a minimum value of 0.0011 and maximum value of 0.6792 indicating that there was a firm that recorded lowest value of long term debt at 1%, while the highest value for total debt was 68%. The mean value for long term debt to market value of assets was 0.1454 within the study period showing that on average the firms have 15%. The standard deviation for total debt to market value of assets was higher than its mean value implying that there was high deviation from the actual mean. The skewness and kurtosis depict that the data were not normally distributed as it recorded a joint p-value of 0.0000. However, the average values of lev1 (56%) and lev2 (14%) reveal that short term debts account for a larger portion of financing for oil and gas companies in Nigeria.

Profitability was measured as the ratio of earnings before interest, taxes and depreciation to market value of assets. It has a minimum value of -0.6399 and a maximum value of 0.8428, implying that negative profit was a reality within the study period to the tune of 64% while the highest level of profitability was 84%. Profitability showed a mean value of 0.8381 implying that on average, most of the firm performed at the level of 84%. The standard deviation of profitability implies that there is little deviation from mean value which is at 15%. The skewness and kurtosis value implies that the data were not normally distributed for this variable.

Market-to-book ratio was used to measure growth opportunity. It exhibited a minimum value of 0.0017 and a maximum value of 0.9617 implying that there was a firm who had growth opportunity below 1% while the firm that witnessed the highest growth rate was 96%. On average, growth opportunity recorded a value of about 6% implying that most of the firms experienced growth. The standard deviation for this variable implies that its mean is not the actual mean with little deviation. The data for growth was not normally distributed based on the result from the skewness and kurtosis test which joint p-value = 0.0000.

Tangibility ranged from 0.0232 to 0.8875. This indicates that the lowest and highest levels of efficiency of assets utilization by the firms within the study period was 2% and 89% respectively. However, on average, the value of tangibility of assets by the firms for the period was about 0.4061, implying that, most of the firms recorded efficient utilization of assets to the tune of 41%. The standard deviation recorded indicates that the mean value of tangibility was the true mean for the firms as it recorded a value below the mean. The skewness and kurtosis value showed that the data for tangibility was not normally distributed.

The current ratio was used to measure liquidity which is equal to current assets divided by current liabilities. Liquidity has a minimum value of 0.2948 and maximum value of 4.4746 implying that liquidity of the firms was as low as 29% for a firm within the study period, while the firm with largest value of liquidity was about 447%. The average value of liquidity stood at about 106%. The standard deviation for liquidity shows that the average value recorded represent the true mean while the skewness and kurtosis values imply that the data was not normally distributed.

Firm size was measured as natural log of total assets.It has a minimum value of 14.70 with a maximum value of 20.70. On average, firm size stood at 18.09 for the firms within the study period. The value of standard deviation implies that the mean value represents the true average for the firms. Skewness and kurtosis test conducted for the variable shows that the data was normally distributed with a joint p-value of 0.4090.

Expected Inflation was measured using treasury bills rate and it recorded a minimum value of 0.04 and a maximum value of 14.27 for the firms implying that the lowest level of inflation among the firms was 4% while the largest stood at 14.27%. The mean value for expected inflation shows that on average the value of inflation among the firms was 9%. Skewness and kurtosis values were not within the acceptable range, showcasing abnormality of the data. However, median industry leverage which is measured by the median of total debt to MVA has a minimum value of 0.2146 and a maximum value of 0.8127. The maximum value of 81% indicates the presence of high debt ratio among listed oil and gas firms in Nigeria. On average, listed oil and gas firms recorded 0.5413 and it deviates from the mean at 20%. This shows that there is no much gap between the leverage of listed oil and gas firms in Nigeria. However, the probability of skewness and kurtosis is significant indicating the abnormality of the data.

4.3 Correlation Analysis

Table 4.2 displays the correlation coefficients between dependent and the independent variables and also the relationship between the independent variables themselves.

Table 4.2: Correlation Matrix

	Lev1	Lev2	Prof	Growth	Tan	Liqui	Size	Infla	industm
Lev1	1								
Lev2	0.4483*	1							
Prof	-0.3978*	-0.2184*	1						
Growth	-0.5628*	-0.2099*	0.1042	1					
Tan	-0.0589	0.2663*	-0.1961	0.1309	1				
Liqui	-0.0444	0.2376*	0.0954	-0.1102	0.2392*	1			
Size	0.0455	-0.0083	0.1323	-0.0175	-0.1303	-0.2953*	1		
Infla	0.3154*	0.0591	0.1451	-0.2437*	0.0919	-0.1299	0.0146	1	
Industm	0.6064*	0.2170*	-0.2221*	-0.4069*	0.0446	-0.1493	0.1465	0.5077*	1

Source: Correlation Matrix Result from Stata 13

*Correlation is significant at 0.01 or 5% level

From Table 4.2, profitability is negatively correlated to lev1 and lev2 at 40% and 22% respectively which shows a strong and significant relation with both measures of leverage. As for growth, it is negatively correlated with both lev1 and lev2 at 56% and 21% respectively showing a very strong relationship with lev1 and a relatively strong relationship with lev2. However, tangibility is negatively correlated to lev1 but positive to lev2 at 6% and 27% respectively. While the association between tangibility and both measures of leverage are weak and insignificant with lev1 but verysignificant with lev2.

Liquidity was found to have insignificant and negative correlation with lev1 and lev2. The level of relationship between liquidity and lev1 is at about 4%, while the relationship between liquidity and lev2 is at a degree of 24%. Similarly, Size recorded a very weak and insignificant relationship with lev1 and lev2 at a value of 4% and 1% respectively. Whereas the correlation between lev1 and firm size was positive and that of lev2 was found to be negative.

However, Inflation also recorded 31% and 6% negative correlation with lev1 and lev2. The relationships between inflation and both lev1 and lev2 is relatively strong and significant for lev1 and very weak and insignificant for lev2. Similarly, median industry leverage showed a strong positive association with lev1 which is significant at 60% whereas its relationship with lev2 is also positive and relatively strong at 22% which is insignificant.

The relationships amongst the independent variables themselves were found to be less than or equal to 50% except for inflation and median industry leverage that were significantly related at 51% level of magnitude.However, it cannot be concluded that multicollinearity exists among the independent variables of study until the variance inflation factor and tolerance values are far and above the limits expected which is ten (10) and one (1) respectively. The Variance inflation factor and tolerance were found to be consistently smaller than ten and one respectively (see Appendix vi), indicating absence of multicollinearity (Cassey & Anderson, 1999).

4.4 Robustness Tests

This section presents the result from robustness tests conducted. The robustness tests included multicollinearity test, heteroscedasticity test and kdensity test

i. **Multicollinearity test:** This was conducted to check whether there was a correlation amongst the independent variables of the study. From Table 4.2, there was no variable with higher correlation above 0.50 except growth and median industry which recorded 0.56. The low magnitude of the correlations amongst the explanatory variables implies that multicollinearity was not a problem amongst the variables. The variance inflation factor and tolerance estimated were found to be consistently smaller than ten and one respectively (see Appendix), indicating absence of multicollinearity (Cassey & Anderson, 1999).

ii. **Heteroscedasticity Tests:** The Breusch-Pagan/Cook-Weisberg test for heteroscedasticity reveals a chi-square value of 0.96 with p-value of 0.3264 with respect to model I which is insignificant at 1%, 5% and 10% levels of significance. This therefore signifies absence of heteroscedasticity in the data. However, that of model II reveals a chi-square value of 11.00 with p-value of 0.0009 which is significant at 1% and 5% levels of significance. This therefore signifies presence of heteroscedasticity which violates the OLS assumption of homoscedasticity. Thus, robust regression was conducted in order to ensure the validity of inferences made thereof.

iii. **Kdensity Test:** To further diagnose the robustness of the data and by extension, the results, Kernel Density test was run. The test was run in order to determine the normality of the standard error of dependent variable (Model II). Thus the result depicts a tolerably mild result with a bandwith =0.0442. (see Appendix x).

4.5 Interpretation of Regression Result

This section presents the regression result showing the coefficient values, t-values and the probability values for each independent variable of the study (Profitability, growth, tangibility, liquidity, size and the control variables which are inflation and median industry leverage). It also presents and discusses the cumulative result in respect of fisher exact test and coefficient of determination.

Table 4.3a: Summary of OLS Regression Result for Model I

Variables	Coefficient	t-statistics	Probability
Prof	-0.4410	-3.54	0.001
Growth	-0.7102	-4.53	0.000
Tan	-0.0426	-0.56	0.125
Liqui	0.0020	0.06	0.956
Size	0.0026	0.15	0.896
Infla	-0.1557	-0.24	0.749
Industm	0.4671	4.22	0.000
R^2 Adj R^2 F-statistics F-sign	0.5597 0.5251 14.53 0.0000		

Source: Author's computation using STATA 13

Table 4.3b: Summary of Robust Regression Result for Model II

Variables	Coefficient	t- statistics	Probability
Prof	-0.2497	-3.08	0.003
Growth	-0.1111	-0.64	0.523
Tan	0.5105	8.71	0.000
Liqui	0.0795	3.37	0.001
Size	0.0265	1.84	0.070
Infla	-0.1791	-0.29	0.776
Industm	0.1591	1.88	0.063
R^2 F-statistics F-significance	0.6218 13.46 0.0000		

Source: Author's computation using STATA 13

Table 4.3 shows the cumulative R^2 formodel I and II are 0.5591 and 0.6218 respectively. They are multiple coefficients of determination measuring the proportion of the total variation in the dependent variablesjointly explained by the independent variables. That is,the values indicate that 56% and 62% of the total variation in capital structure of listed oil and gas companies in Nigeria was caused by their profitability, growth, tangibility, liquidity, size, expected inflation and median industry leverage.

The F-statistics of 14.53 and 13.46 for models I and II respectively which are significant at one percent indicate that the capital structure and firm characteristics modelsare well fitted. It implies that for any change in firm characteristics of listed oil and gas companies in Nigeria, their capital structure will be affected directly. The values of F-Statistics for the two models which are statistically significant at 1% imply that there is a 99.9 percent probability that the relationships discernible amongst the variables were not due to mere chance.

i. Firm Profitability and Capital Structure

Profitability exhibits a coefficient value of -0.4410and a t-value of -3.54with a significant value at 1% for capital structure measured as total debt. Similarly, profitability has significant negative impact on capital structure measured using long term debt with coefficient value of -0.2497 and a t-value of -3.08 which is also significant at 1%. This means that profitability negatively and significantly influences both total debt and long term debt. It connotes that when there is an increase in profitability of firms, both total debt and long term debt decrease by their respective coefficient values. This may be as a result of the fact that, the managers of listed oil and gas companies in Nigeria prefer retained earnings believed to be a cheaper source of finance for new investments compared to more expensive external source (debt and equity). The finding confirms the prediction of pecking order hypothesis which posits that higher profitability results in less leverage. Firms prefer raising capital first from retain earnings when financing new investment. Thus, based on the result, there is enough evidence in rejecting the null hypothesis one of thestudy. Thereby, stating that profitability has significant effect on the capital structure of listed oil and gas firms in Nigeria. This findings is consistence with the findings of Rajan and Zingales (1995), Booth *etal* (2001), Kinde (2013), Chechet *etal* (2013), Onaolapo *etal* (2015) and contradicts the findings of Abor (2008), Salawu and Agboola (2008), Akinyomi and Olagunju (2013), Igbinosa and Chijuka (2014).

ii. Firm Growth and Capital Structure

Growth shows a coefficient value of -0.7102and a t-value of -4.53significant at 1% for total debt. For long term debt, growth recorded a coefficient value of -0.1111 and t-value of -0.64 which is insignificant at all levels of significance. This means that firm growth has negative and significant influence on total debt but does not significantly influence long term debt of listed oil and gas companies in Nigeria. This implies that when there is an increase in the level of growth by one percent, total debt of listed oil and gas companies will decrease by the coefficient value. This may be as a result of the fact that when a firm experiences growth, it may be a signal that they are gaining large market share and increased market growth which will enable the firm to be able to reduce total debt. It may also mean that since growth opportunities are viewed as intangible assets which are not fully collaterallizable, firms with high intangible growth opportunities may use more of equity rather than debt in their capital structure (Fama & French, 2002). This finding also confirms the expectation of trade off theory which postulates that firms with more growth opportunities have less debt because they have stronger incentives to avoid under-investment and asset substitution that can arise from stockholder-bondholder agency conflicts (Salawu & Agboola, 2008).

However, with respect to the result as regards firm growth showing that the variable was statistically significant in affecting capital structure (total debt) except for long term debt, there is enough evidence to reject the null hypothesis two of the study. The findings is in line with Sorgorb-Mira (2005), Shehu (2011),Sharif *et al* (2012), Paydar and Bardai (2012) Saleem *etal* (2013) and contradicts the findings of Hall *et al* (2004), Chandrasekharan (2012) and Onaolapo *etal* (2015).

iii. Asset Tangibility and Capital Structure

Tangibility displays a t-value of -0.56and a coefficient value of -0.0462against total debt which is not significant at 1% or 5%. For long term debt, tangibility was found to have positive and significant with a coefficient value 0.5105 and t-value of 8.71 respectively which is significant at 1% level. This means that tangibility has negative but insignificant effect on total debt and positively influencing long term debt of listed oil and gas companies in Nigeria. It implies that when there is an increase in the level of fixed assets, firms can borrow at a relatively cheaper rate of interest at the debt market since it can use its assets as collateral to secure the loan. Thus, oil and gas companies took the advantage of increased tangible assets to increase the proportion of long term debt in their capital mix. This finding confirms the expectations of both trade off theory and pecking order theory this is because tangible assets are subjects to less information asymmetries and can serve as collateral for debt (Onaolapo *etal*, 2015)

Owing to the above outcomes reported as regard tangibility of assets showing it have significant effect on capital structure (long term debt), this has produce evidence that justify to reject the null hypothesis three of the study. The finding is in line with Khrawish and Khraiwesh (2010), Shehu (2011), Akinyo and Olagunju (2013), Chechet *etal* (2013), Onaolapo *etal* (2015), Koksal and Orman (2015) and contradicts the findings of Wanrapee (2009), Sheikh and Wang (2011) who found negative relationship.

iv. Liquidity and Capital Structure

Liquidity recorded a t-value of 0.06and a coefficient value of 0.0020with insignificant value at all levels of significance for total debt, while liquidity was found to have significant positive effect on long term debt as it recorded a coefficient value of 0.0795 and t-value of 8.71 which was significant at 1% level. This result means that liquidity is positively and significantly influencing capital structure (long term debt) of listed oil and gas companies in Nigeria except for total term debt. It implies that when there is an increase in the level of liquidity of the firm, the capital structure need of listed oil and gas companies for long term debt will increase by the coefficient value except for total term debt. This may be as a result of the fact that, when firms are liquid, they can support more debt ratio as such they will be able to discharge their short term contractual obligation (interest payment) on time. Implying that the sampled firms go for long term debt due to their ability to cover their short term obligations as at when due and also using the excess liquidity to indulge in more investments hence attract more returns and as such the need for debt financing especially short term debt will decrease or may not even arise.This finding is in line with the prediction of trade off theory of debt financing.

From foregoing discussion in respect of liquidity of firm having significant positive effect on capital structure (long term debt) except total term debt. This thus, provides an evidence of rejecting null hypothesis four of the study. The finding is in line with the result ofGhasemi and Razak (2016) and contradicts the findings of Ramlall (2009), Ebadi *etal* (2011), Zabri (2012), Sharif *etal* (2012), Shala *etal* (2014) Ghasemi and Razak (2016). The contradictions with prior studies is due to firm specific and country factors of the sector under study that is the oil and gas companies in Nigeria. The average liquidity of oil and gas firms in Nigeria during the span of this study is 106% (see table 4.1) indicating that oil and gas firms in Nigeria are very liquid thereby making them to go for more long term debt.

v. Firm Size and Capital Structure

From the Table 4.3, it was observed that the t-value for size was 0.15 with a coefficient value of 0.0026 which is insignificant at all levels of significance total debt for firms. For long term debt, size was found to have positive and significant effect as it records t-value of 1.84 and a coefficient value of 0.0265 which was significant at 10% level. This signifies that size impacts positively and significantly on capital structure (long term debt) of listed oil and gas companies in Nigeria except for total term debt. This also implies that for every one percent increase in the size of the firm, the capital structure of firm increases by their coefficient value. This may be as a result of the fact that, as the firms attempt to increase their assets and capital base, they may opt for debt financing through the use of long term debt. This may also be as a result of the fact that default risk associated with large and more diversified firms is lower when they choose debt in their capital structure. It could also be due to the better reputation that large firms enjoy in the debt market thus reducing the debt related agency cost. This result is as predicted by trade off theory which expects that large firms tend to hold more debt because they are regarded as too big to fail which make them enjoygreater access to the capital market (Bevan & Danbolt, 2002).

This revelation of a positive and significant size-capital structure (long term debt) linkage provides sufficient grounds to reject null hypothesis five of the study. The result of this finding is in line with those of Eriotis (2007), Antoniou *etal* (2008), Ali (2011), Thomas *etal* (2014), Onaolapo *etal* (2015) and contradicts the negative findings of Ikechukwu and Madubuko (2016).

vi. Inflation and Capital Structure

The regression results revealed that inflation against total debt as shown in Table 4.3 has a t-value of -0.24 and a coefficient value of -0.1557 which is insignificant at all levels of significance. Also, inflation was found to have negative and insignificant effect on long term debt of firms as it shows a coefficient value of -0.1791 and a t-value of -0.29 which is statistically insignificant at 1%, 5% and 10%. This indicates that a unit change in inflation brings about a negative change in capital structure by 18%. This implies that listed firms in Nigeria use less debt in their capital structure when inflation is expected. This is because inflation is associated with increased borrowing cost and firm management must make viable investment that will yield return to off-set the cost of borrowing. This result is in line with the prediction of trade off theory but contradicts the statistical association between expected inflation and the two measures of leverage.

vii. Median Industry Leverage and Capital Structure

From Table 4.3, it is observed that the coefficient value of median industry leverage is 0.4647 with a t-value of 4.22 which is significant at 1% for total debt. Also, median industry leverage was found to have positive and significant effect on long term debt of firms as it shows a coefficient value of 0.1591 and a t-value of 1.88 statistically significant at 10%. This signifies that median industry positivelyand significantly influences capital structure. This may be as a result of the fact that a firm capital structure is influenced by the financial decisions of its peers within the same industry. This is in line with trade off theory which predicts that higher industry median leverage results in more debt (Frank & Goyal, 2009).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

This study investigates the behaviour of capital structure vis a vis its determinants amongst the listed downstream oil and gas companies in Nigeria. The study specifically investigates the effects of firm profitability, firm growth, assets tangibility, liquidity and firm size on capital structure of downstream oil and gas firms listed in the Nigerian Stock Exchange within the period of 2006 to 2016 financial years. Eight firms were sampled which constitutes 80% of the population of the study and data were sought from their annual reports and accounts as well as other corporate websites. Two leverage variants were considered in the study through the use of market definition of leverage ratios which formed the dependent variables.

Relying upon correlation research design, Ordinary Least Square regression was used to examine the effects of firm characteristics on capital structure of listed oil and gas firms in Nigeria.The findings revealed that firm characteristics have significant effects on listed oil and gas companies in Nigeria. The individual results revealed that profitability has a negative and significant effect on the leverage of listed oil and gas firms in Nigeria based on model 1 and model two. This confirmed the prediction of pecking-order theory and also showed that oil and gas firms in Nigeria prefer the use of internally generated funds (retained earnings) to debt in their financing options when there is increased profitability. However, the effect of firm growth on the leverage choice of listed oil and gas companies in Nigeria was negative and significant for model 1 but negative and insignificant for model 2. Similarly, tangibility, liquidity and firm size was discovered to have positive and highly significant impact on the leverage of listed oil and gas firms based on model 2 but exhibit negative and insignificant influence as revealed by model 1.

5.2 Conclusions

Based on the key findings, the study concludes that firm characteristics have significant impact on the choice of capital structure by listed oil and gas firms in Nigeria. The findings of this study revealed that appropriate level of growth, tangibility, liquidity, and size depends on the measure of leverage, while profitability is significant for both measures of leverage. Therefore, this study concludes that profitability has an inverse relation with the leverage measures of listed oil and gas companies within the study period; while that of growth is also negative but only on the total debt measure of leverage. In addition, tangibility, liquidity, and size portrayed a positive effect on the long term debt measure of leverage of listed oil and gas companies for the period under review.

The study also concludes that a single measure of leverage as a proxy of capital structure especially total debt as used by previous studies may not adequately capture its significance and level of correlation with the explanatory factors. That is, when measuring capital structure, adequate attention should be given to the proxies used in measuring it. This is because decisions on capital structure are long-term based. Therefore, measuring capital structure using total debt may be difficult to interpret due to the amount of trade credit included in short term debt.The findings of the study are in agreement with the predictions of the trade off and pecking order theories of corporate financial decisions.

5.3 Recommendations

Based on the summary and conclusions drawn from the study, the following recommendations are proffered;

i. The assets of the firms should be efficiently and effectively utilized to ensure increasing revenue at minimum costs. This will facilitate increasing retained earnings from which growth opportunities may be financed without necessarily opting for debt (believed to be more expensive). Also, with increased profitability, immediate financing needs will be met without incurring fresh debt-related burden. In addition, the relevant authorities should strive to restore the sector's investors and creditors' confidence by ensuring enabling environment capable of facilitating increasing business profitability.

ii. The option of debt should be chosen with utmost circumspection to hedge against shareholderslosing control to the bondholders. More clearly, when opting for debt only asset tangibility, liquidity and firm size should be considered and the associated costs and benefits must be carefully evaluated. It is also recommended that the management of firms should remain liquid at all times by ensuring that their current liabilities do not exceed their current assets so that their financial obligations can be discharged on time.

iii. The findings of this study also showed that listed Nigeria oil and gas firms total obligations comprises more short term than long term debts. This may have stemmed from the underdevelopment of the debt market in the country and also the illiquid nature of the public traded bonds. Thus, this study recommends that the Securities and Exchange Commission should formulate and enforce liquidity-boosting rules and regulations.This will go a long way to encouraging the participation of the oil and gas companies. This will enable them access long term loans which are believed to be cheaper compared to short term borrowings and also enable firms to liquidate debts they no longer need.

5.4 Limitations of the Study

Like most other studies, this research is subject to some constraints. These include:

i. The study was conducted on listed oil and gas firms in Nigeria for the period 2006 to 2016. Therefore, the results may slightly differ from other sectors and or other periods.

ii. The study utilized only a single measure of each firm characteristic, whereas there are alternative measures of such firm characteristics. Thus, different proxies for firm characteristics may have differing influence on capital structure. Hence, the results are only applicable and comparable where the objectives are in line with the measurements used in this study.

iii. Measures used to quantify properties (such as capital structure) are neither perfect nor absolute. Market leverage has been chosen in this research to represent capital structure. The resulting findings may not necessarily conform to those of otherrelated studies that made use of different measures. Therefore, caution should be applied in comparing the results of this study with those that use different measures of leverage.

5.5 Areas for further Study

This work investigates the effect of firm characteristics on capital structure of listed oil and gas firms in Nigeria. However, the limitations justify suggestions for further research in areas identified below;

i. The variables used in this study can also be examined in different business sectors of the economy to see whether the results will be similar to that of the listed oil and gas sector in Nigeria.

ii. This study investigated the effect of profitability, firm growth, firm size, liquidity and tangibility on the leverage of listed oil and gas firms in Nigeria. These variables do not exhaust the possible determinants of capital structure. Other variables such business risk, age, tax, non-debt tax shieldwhich are not captured in this study may be considered and the results compared for possible convergence or divergence.

iii. Other measures of leverage such as measures based on interest bearing liabilities and book leveragecan also be investigated on this set of data to investigate possible sensitivity of results to different measures of leverage.

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Appendix I: Descriptive Statistics

```
. xtset id year, yearly
       panel variable:  id (strongly balanced)
        time variable:  year, 2006 to 2016
                delta:  1 year
. xtsum lev1 lev2 prof growth tan liqui size infla industm

Variable         |      Mean   Std. Dev.       Min        Max |    Observations
-----------------+--------------------------------------------+----------------
lev1     overall |  .5565981   .2387503   .0831544   .9358481 |     N =      88
         between |             .1479736   .3422509   .7934501 |     n =       8
         within  |             .1939647   .0747665   .9447516 |     T =      11
                 |                                            |
lev2     overall |  .1453907   .1789098   .0010957   .6792343 |     N =      88
         between |             .1621565   .0247839   .4924398 |     n =       8
         within  |             .0934686  -.2123549   .4364814 |     T =      11
                 |                                            |
prof     overall |   .083808    .149113   -.639857   .8428407 |     N =      88
         between |             .0662685  -.0386346    .182356 |     n =       8
         within  |             .1354545  -.5174143   .8041487 |     T =      11
                 |                                            |
growth   overall |  .0660513    .126395   .0016878   .9616594 |     N =      88
         between |             .0426875   .0169281   .1334735 |     n =       8
         within  |             .1198454  -.0643531   .8942372 |     T =      11
                 |                                            |
tan      overall |  .4061428   .2376993   .0231603    .887509 |     N =      88
         between |              .199566   .1442957   .7920836 |     n =       8
         within  |             .1457812   .1164154   .8830947 |     T =      11
                 |                                            |
liqui    overall |  1.067973   .5907644   .2947867   4.474591 |     N =      88
         between |             .3103908   .6106342   1.652642 |     n =       8
         within  |             .5135504  -.2727199   3.889921 |     T =      11
                 |                                            |
size     overall |  18.09204    1.12269   14.70076   20.70981 |     N =      88
         between |             1.046144   16.64899   19.87129 |     n =       8
         within  |             .5401946   15.95052   19.74667 |     T =      11
infla    overall |  .0872364   .0314126        .04      .1427 |     N =      88
         between |                    0   .0872364   .0872364 |     n =       8
         within  |             .0314126        .04      .1427 |     T =      11
                 |                                            |
industm  overall |  .5412904   .2048508   .2146184   .8127142 |     N =      88
         between |                    0   .5412904   .5412904 |     n =       8
         within  |             .2048508   .2146184   .8127142 |     T =      11
```

Appendix II: Normality Test

```
. sktest lev1 lev2 prof growth tan liqui size infla industm
```

Skewness/Kurtosis tests for Normality

Variable	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	joint Prob>chi2
lev1	0.652	0.000	27.64	0.0000
lev2	0.000	0.004	27.57	0.0000
prof	0.684	0.000	24.67	0.0000
growth	0.000	0.000	.	0.0000
tan	0.031	0.039	7.96	0.0187
liqui	0.000	0.000	62.21	0.0000
size	0.460	0.275	1.79	0.4090
infla	0.807	0.000	14.06	0.0009
industm	0.246	0.000	45.57	0.0000

```
. swilk lev1 lev2 prof growth tan liqui size infla industm
```

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
lev1	88	0.94613	4.000	3.054	0.00113
lev2	88	0.72729	20.248	6.626	0.00000
prof	88	0.71940	20.833	6.689	0.00000
growth	88	0.47596	38.907	8.065	0.00000
tan	88	0.93287	4.984	3.538	0.00020
liqui	88	0.67712	23.972	6.998	0.00000
size	88	0.97389	1.938	1.458	0.07243
infla	88	0.95392	3.421	2.709	0.00337
industm	88	0.93921	4.513	3.320	0.00045

Appendix III: Correlation Matrix

```
. pwcorr lev1 lev2 prof growth tan liqui size infla industm, star (0.05)
```

	lev1	lev2	prof	growth	tan	liqui	size
lev1	1.0000						
lev2	0.4483*	1.0000					
prof	-0.3978*	-0.2184*	1.0000				
growth	-0.5628*	-0.2099*	0.1042	1.0000			
tan	0.0589	0.2663*	-0.1961	-0.1309	1.0000		
liqui	-0.0444	0.2376*	0.0954	-0.1102	0.2392*	1.0000	
size	0.0455	-0.0083	0.1323	-0.0175	-0.1303	-0.2953*	1.0000
infla	0.3154*	0.0581	-0.1451	-0.2437*	0.0919	-0.1299	0.0146
industm	0.6064*	0.2170*	-0.2221*	-0.4069*	0.0446	-0.1493	0.1465

	infla	industm
infla	1.0000	
industm	0.5077*	1.0000

Appendix IV: Ordinary Least Square Regression Result (Model I)

```
. reg lev1 prof growth tan liqui size infla industm

      Source |       SS       df       MS              Number of obs =      88
-------------+------------------------------           F(  7,    80) =   14.53
       Model |  2.77554379     7  .396506256           Prob > F      =  0.0000
    Residual |  2.18360321    80   .02729504           R-squared     =  0.5597
-------------+------------------------------           Adj R-squared =  0.5212
       Total |  4.95914701    87   .05700169           Root MSE      =  .16521

------------------------------------------------------------------------------
        lev1 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        prof |   -.441038   .1246046    -3.54   0.001    -.6890091   -.193067
      growth |  -.7101775   .1566194    -4.53   0.000     -1.02186   -.398495
         tan |  -.0426056   .0754247    -0.56   0.574    -.1927055   .1074943
       liqui |   .0019851    .032544     0.06   0.952    -.0627795   .0667497
        size |   .0026077    .017142     0.15   0.879     -.031506   .0367213
       infla |  -.1556611   .6602407    -0.24   0.814    -1.469582    1.15826
     industm |   .4670536   .1106079     4.22   0.000     .2469369   .6871703
       _cons |   .3692424   .3304077     1.12   0.267    -.2882899   1.026775
------------------------------------------------------------------------------
```

Appendix V: Hetroskedasticity Test Result (Model I)

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of lev1

         chi2(1)      =     0.96
         Prob > chi2  =   0.3264
```

Appendix VI: Multicolinearity Test Result (Model I)

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
     industm |      1.64    0.611106
       infla |      1.37    0.729375
      growth |      1.25    0.800596
        size |      1.18    0.847077
       liqui |      1.18    0.848779
        prof |      1.10    0.908794
         tan |      1.02    0.976071
-------------+----------------------
    Mean VIF |      1.25
```

Appendix VII: Ordinary Least Square Regression Result (Model II)

```
. reg lev2 prof growth tan liqui size infla industm

      Source |       SS       df       MS              Number of obs =      88
-------------+------------------------------           F(  7,    80) =   18.79
       Model |  1.73170062     7  .247385803           Prob > F      =  0.0000
    Residual |  1.05305827    80  .013163228           R-squared     =  0.6218
-------------+------------------------------           Adj R-squared =  0.5888
       Total |  2.78475889    87  .032008723           Root MSE      =  .11473

------------------------------------------------------------------------------
        lev2 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        prof |  -.2497428   .0865313    -2.89   0.005    -.4219456   -.0775399
      growth |  -.1110772   .1087639    -1.02   0.310    -.3275244    .1053699
         tan |   .5105033   .0523785     9.75   0.000     .4062668    .6147398
       liqui |   .0795725   .0226001     3.52   0.001      .034597    .1245481
        size |   .0265535   .0119042     2.23   0.029     .0028634    .0502436
       infla |  -.1791161   .4585024    -0.39   0.697    -1.091565    .7333328
     industm |   .1591152   .0768114     2.07   0.042     .0062557    .3119747
       _cons |  -.6695694   .2294508    -2.92   0.005    -1.126191   -.2129478
------------------------------------------------------------------------------
```

Appendix VII: Hetroskedasticity Test Result (Model II)

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of lev2

         chi2(1)      =    11.00
         Prob > chi2  =   0.0009
```

Appendix VIII: Multicolinearity Test Result (Model II)

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
     industm |      1.64    0.611106
       infla |      1.37    0.729375
      growth |      1.25    0.800596
        size |      1.18    0.847077
       liqui |      1.18    0.848779
        prof |      1.10    0.908794
         tan |      1.02    0.976071
-------------+----------------------
    Mean VIF |      1.25
```

Appendix IX: Robust Regression (Model II)

```
. reg lev2 prof growth tan liqui size infla industm, robust

Linear regression                               Number of obs =         88
                                                F(  7,    80) =      13.46
                                                Prob > F      =     0.0000
                                                R-squared     =     0.6218
                                                Root MSE      =     .11473
```

lev2	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
prof	-.2497428	.0809639	-3.08	0.003	-.4108661	-.0886195
growth	-.1110772	.1731667	-0.64	0.523	-.45569	.2335356
tan	.5105033	.0586314	8.71	0.000	.393823	.6271836
liqui	.0795725	.0235831	3.37	0.001	.0326407	.1265043
size	.0265535	.0144388	1.84	0.070	-.0021807	.0552877
infla	-.1791161	.6281517	-0.29	0.776	-1.429178	1.070946
industm	.1591152	.0844138	1.88	0.063	-.0088737	.3271041
_cons	-.6695694	.2540758	-2.64	0.010	-1.175196	-.1639424

Appendix X: Kdensity Estimation Graph (ModelII)

```
. predict e
(option xb assumed; fitted values)
. kdensity e
```