



# **Determinants of the Capital Structure of Ghanaian Firms**

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AERC Research Paper 176  
African Economic Research Consortium, Nairobi  
March 2008



**THIS RESEARCH STUDY** was supported by a grant from the African Economic Research Consortium. The findings, opinions and recommendations are those of the author, however, and do not necessarily reflect the views of the Consortium, its individual members or the AERC Secretariat.

Published by: The African Economic Research Consortium  
P.O. Box 62882 - City Square  
Nairobi 00200, Kenya

Printed by: Modern Lithographic (K) Ltd  
P.O. Box 52810 - City Square  
Nairobi 00200, Kenya

ISBN 9966-778-23-3

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## Abstract

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This study compares the capital structures of publicly quoted firms, large unquoted firms, and small and medium enterprises (SMEs) in Ghana. Using a panel regression model, the paper also examines the determinants of capital structure decisions among the three sample groups. The results show that quoted and large unquoted firms exhibit significantly higher debt ratios than do SMEs. The results did not show significant difference between the capital structures of publicly quoted firms and large unquoted firms. The results reveal that short-term debt constitutes a relatively high proportion of total debt of all the sample groups. The regression results indicate that age of the firm, size of the firm, asset structure, profitability, risk and managerial ownership are important in influencing the capital structure decisions of Ghanaian firms. For the SME sample, it was found that factors such as the gender of the entrepreneur, export status, industry, location of the firm and form of business are also important in explaining the capital structure choice. The study provides useful recommendations for policy direction and management of these firms.

## Acknowledgements

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I am very grateful to the African Economic Research Consortium for funding this research project. I am thankful to the resource persons and members of Group C for their insightful comments and suggestions from the beginning of the project to its completion. I also appreciate the useful comments by two anonymous referees, which have helped in improving the quality of the paper. I am, however, responsible for errors and omissions in the study.

# 1. Introduction

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Corporate sector growth is vital to economic development. The issue of finance has been identified as an immediate reason why businesses in developing countries fail to start or to progress. It is imperative for firms in developing countries to be able to finance their activities and grow over time if they are ever to play an increasing and predominant role in providing employment as well as income in terms of profits, dividends and wages to households. Growing SMEs will also contribute to expanding the size of the directly productive sector in the economy; generating tax revenue for the government; and, all in all, facilitating poverty reduction through fiscal transfers and income from employment and firm ownership (Prasad et al., 2001).

To understand how firms in developing countries finance their operations, it is necessary to examine the determinants of their financing or capital structure decisions. Company financing decisions involve a wide range of policy issues. At the macro level, they have implications for capital market development, interest rate and security price determination, and regulation. At the micro level, such decisions affect capital structure, corporate governance and company development (Green, Murinde and Suppakitjarak, 2002). Knowledge about capital structures has mostly been derived from data from developed economies that have many institutional similarities (Booth et al., 2001). It is important to note that different countries have different institutional arrangements, mainly with respect to their tax and bankruptcy codes, the existing market for corporate control, and the roles banks and securities markets play. There are also differences in social and cultural issues and even the levels of economic development. These differences actually warrant taking a thorough look at the issue from the perspective of developing economies, especially within the context of sub-Saharan Africa.

The few studies on developing countries have not even agreed on the basic facts. Singh and Hamid (1992) and Singh (1995) used data on the largest companies in selected developing countries. They found that firms in developing countries made significantly more use of external finance to finance their growth than is typically the case in the industrialized countries. They also found that firms in developing countries rely more on equity finance than debt finance. These findings seem surprising given that stock markets in developing countries are invariably less well developed than those in the industrial countries, especially for equities. However, in an Indian study, Cobham and Subramaniam (1998) used a sample of larger firms and found that Indian firms use substantially lower external and equity financing. In a study of large companies in ten developing countries, Booth et al. (2001) also found that debt ratios varied substantially across developing countries, but overall were not out of line with comparable data for industrial countries.

In the last decade, most countries have shifted their development strategies towards a greater reliance on private companies and on the use of organized capital markets to finance these companies. This underlines the importance of research on the functioning and financing of private companies in a wide range of institutional environments, particularly in developing countries (Green, Murinde and Suppakitjarak, 2002).

Our study examines the determinants of financing choices (capital structure) of Ghanaian firms. A study on the determinants of the capital structure of Ghanaian firms is an important research area that needs to be explored. By comparing the capital structures of quoted firms, large unquoted firms, and small and medium enterprises (SMEs) in Ghana, this study is relevant in the Ghanaian context given the important role the private sector is expected to play as the engine of growth. Ghana's recently developed Medium-Term National Private Sector Development Strategy articulates government's commitment to facilitating private sector-led growth. It is expected that the findings of this study will have important policy implications for Ghanaian firms.

The remainder of the paper is organized as follows: Section two provides a review of the extant literature in the area. Section three discusses the methodology employed and Section four presents and discusses the empirical results. Section five concludes the discussion and provides some implications based on the findings of the study.

## 2. Literature review

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Our discussion of the literature on capital structure first considers definitions and the general theory of capital structure. This is followed by a review of the empirical literature on the determinants of capital structure choice.

### Theory on capital structure

Capital structure is defined as the specific mix of debt and equity a firm uses to finance its operations. Four important theories are used to explain the capital structure decisions. These are based on asymmetric information, tax benefits associated with debt use, bankruptcy cost and agency cost. The first is rooted in the pecking order framework, while the other three are described in terms of the static trade-off choice. These theories are discussed in turn.

The concept of optimal capital structure is expressed by Myers (1984) and Myers and Majluf (1984) based on the notion of asymmetric information. The existence of information asymmetries between the firm and likely finance providers causes the relative costs of finance to vary among different sources of finance. For example, an internal source of finance where the funds provider is the firm will have more information about the firm than new equity holders, thus these new equity holders will expect a higher rate of return on their investments. This means it will cost the firm more to issue fresh equity shares than to use internal funds. Similarly, this argument could be provided between internal finance and new debt-holders. The conclusion drawn from the asymmetric information theories is that there is a certain pecking order or hierarchy of firm preferences with respect to the financing of their investments (Myers and Majluf, 1984). This “pecking order” theory suggests that firms will initially rely on internally generated funds, i.e., undistributed earnings, where there is no existence of information asymmetry; they will then turn to debt if additional funds are needed, and finally they will issue equity to cover any remaining capital requirements. The order of preferences reflects the relative costs of various financing options. Clearly, firms would prefer internal sources to costly external finance (Myers and Majluf, 1984). Thus, according to the pecking order hypothesis, firms that are profitable and therefore generate high earnings are expected to use less debt capital than those that do not generate high earnings.

Capital structure of the firm can also be explained in terms of the tax benefits associated with the use of debt. Green, Murinde and Suppakitjarak (2002) observe that tax policy has an important effect on the capital structure decisions of firms. Corporate taxes allow firms to deduct interest on debt in computing taxable profits. This suggests that tax

advantages derived from debt would lead firms to be completely financed through debt. This benefit is created, as the interest payments associated with debt are tax deductible, while payments associated with equity, such as dividends, are not tax deductible. Therefore, this tax effect encourages debt use by the firm, as more debt increases the after tax proceeds to the owners (Modigliani and Miller, 1963; Miller, 1977). It is important to note that while there is corporate tax advantage resulting from the deductibility of interest payment on debt, investors receive these interest payments as income. The interest income received by the investors is also taxable on their personal account, and the personal income tax effect is negative. Miller (1977) and Myers (2001) argue that as the supply of debt from all corporations expands, investors with higher and higher tax brackets have to be enticed to hold corporate debt and to receive more of their income in the form of interest rather than capital gains. Interest rates rise as more and more debt is issued, so corporations face rising costs of debt relative to their costs of equity. The tax benefits arising from the issue of more corporate debt may be offset by a high tax on interest income. It is the trade-off that ultimately determines the net effect of taxes on debt usage (Miller, 1977; Myers, 2001).

Bankruptcy costs are the costs incurred when the perceived probability that the firm will default on financing is greater than zero. The potential costs of bankruptcy may be both direct and indirect. Examples of direct bankruptcy costs are the legal and administrative costs in the bankruptcy process. Haugen and Senbet (1978) argue that bankruptcy costs must be trivial or nonexistent if one assumes that capital market prices are competitively determined by rational investors. Examples of indirect bankruptcy costs are the loss in profits incurred by the firm as a result of the unwillingness of stakeholders to do business with them. Customer dependency on a firm's goods and services and the high probability of bankruptcy affect the solvency of firms (Titman, 1984). If a business is perceived to be close to bankruptcy, customers may be less willing to buy its goods and services because of the risk that the firm may not be able to meet its warranty obligations. Also, employees might be less inclined to work for the business or suppliers less likely to extend trade credit.

These behaviours by the stakeholders effectively reduce the value of the firm. Therefore, firms that have high distress cost would have incentives to decrease outside financing so as to lower these costs. Warner (1977) maintains that such bankruptcy costs increase with debt, thus reducing the value of the firm. According to Modigliani and Miller (1963), it is optimal for a firm to be financed by debt in order to benefit from the tax deductibility of debt. The value of the firm can be increased by the use of debt since interest payments can be deducted from taxable corporate income. But increasing debt results in an increased probability of bankruptcy. Hence, the optimal capital structure represents a level of leverage that balances bankruptcy costs and benefits of debt finance. The greater the probability of bankruptcy a firm faces as the result of increases in the cost of debt, the less debt they use in the issuance of new capital (Pettit and Singer, 1985).

The use of debt in the capital structure of the firm also leads to agency costs. Agency costs arise as a result of the relationships between shareholders and managers, and those between debt-holders and shareholders (Jensen and Meckling, 1976). The relationships can be characterized as principal-agent relationships. While the firm's management is the agent, both the debt-holders and the shareholders are the principals. The agent may choose not to maximize the principals' wealth. The conflict between shareholders and

managers arises because managers hold less than 100% of the residual claim (Harris and Raviv, 1990). Consequently, they do not capture the entire gain from their profit-enhancing activities but they do bear the entire cost of these activities. Separation of ownership and control may result in managers exerting insufficient work, indulging in perquisites, and choosing inputs and outputs that suit their own preferences. Managers may invest in projects that reduce the value of the firm but enhance their control over its resources. For example, although it may be optimal for the investors to liquidate the firm, managers may choose to continue operations to enhance their position. Harris and Raviv (1990) confirm that managers have an incentive to continue a firm's current operations even if shareholders prefer liquidation.

On the other hand, the conflict between debt-holders (creditors) and shareholders is due to moral hazard. Agency theory suggests that information asymmetry and moral hazard will be greater for smaller firms (Chittenden et al., 1996). Conflicts between shareholders and creditors may arise because they have different claims on the firm. Equity contracts do not require firms to pay fixed returns to investors but offer a residual claim on a firm's cash flow. However, debt contracts typically offer holders a fixed claim over a borrowing firm's cash flow. When a firm finances a project through debt, the creditors charge an interest rate that they believe is adequate compensation for the risk they bear. Because their claim is fixed, creditors are concerned about the extent to which firms invest in excessively risky projects. For example, after raising funds from debt-holders, the firm may shift investment from a lower-risk to a higher-risk project.

According to Jensen and Meckling (1976), the conflict between debt-holders and equity-holders arises because debt contract gives equity-holders an incentive to invest sub optimally. More specifically, in the event of an investment yielding large returns, equity-holders receive the majority of the benefits. However, in the case of the investment failing, because of limited liability, debt-holders bear the majority of the consequences. In other words, if the project is successful, the creditors will be paid a fixed amount and the firm's shareholders will benefit from its improved profitability. If the project fails, the firm will default on its debt, and shareholders will invoke their limited liability status. In addition to the asset substitution problem between shareholders and creditors, shareholders may choose not to invest in profitable projects (under invest) if they believe they would have to share the returns with creditors.

The agency costs of debt can be resolved by the entire structure of the financial claim. Barnea et al. (1980) argue that the agency problems associated with information asymmetry, managerial (stockholder) risk incentives and forgone growth opportunities can be resolved by means of the maturity structure and call provision of the debt. For example, shortening the maturity structure of the debt and the ability to call the bond before the expiration date can help reduce the agency costs of underinvestment and risk-shifting. Barnea et al. (1980) also demonstrate that both features of the corporate debt serve as identical purposes in solving agency problems.

## Determinants of capital structure

Following from these theoretical standpoints, a number of empirical studies have identified firm-level characteristics that affect the capital structure of firms. Among

these characteristics are age of the firm, size of the firm, asset structure, profitability, growth, firm risk, tax and ownership structure. In the case of SMEs, other heterodox factors such as industry, location of the firm, entrepreneur's educational background and gender, form of business, and export status of the firm may explain their capital structure.

### ***Age of the firm***

Age of the firm is a standard measure of reputation in capital structure models. As a firm continues longer in business, it establishes itself as an ongoing business and therefore increases its capacity to take on more debt; hence age is positively related to debt. Before granting a loan, banks tend to evaluate the creditworthiness of entrepreneurs as these are generally believed to pin high hopes on very risky projects promising high profitability rates. In particular, when it comes to highly indebted companies, they are essentially gambling their creditors' money. If the investment is profitable, shareholders will collect a significant share of the earnings, but if the project fails, then the creditors have to bear the consequences (Myers, 1977). To overcome problems associated with the evaluation of creditworthiness, Diamond (1989) suggests the use of firm reputation. He takes reputation to mean the good name a firm has built up over the years; the name is recognized by the market, which has observed the firm's ability to meet its obligations in a timely manner. Directors concerned with a firm's reputation tend to act more prudently and avoid riskier projects in favour of safer projects, even when the latter have not been approved by shareholders, thus reducing debt agency costs (by reducing the "temptation" to gamble at creditors' cost).

This perspective has also been seconded within the context of small business (see Ang, 1991). It is important to note the extension of firm risk to the personal area of the businessperson (given the unlimited liability of entrepreneurs) to be a way of managing the agency costs resulting from cases of more opportunistic behaviour. Given the fragmentation of information, and the high costs of control and evaluation, the firm's and the entrepreneur's reputations become a valuable asset in the management of relations between the principal (investor) and the agent (businessperson) (Landström, 1993). Petersen and Rajan (1994) found that older firms should have higher debt ratios since they should be higher quality firms. Hall et al. (2004) agreed that age is positively related to long-term debt but negatively related to short-term debt. Esperança et al. (2003), however, found that age is negatively related to both long-term and short-term debt. Green, Murinde and Suppakitjarak (2002) also found that age has a negative influence on the probability of incurring debt in the initial capital equation, and no impact in the additional capital equation.

### ***Firm size***

Size has been viewed as a determinant of a firm's capital structure. Larger firms are more diversified and hence have lower variance of earnings, making them able to tolerate high debt ratios (Castanias, 1983; Titman and Wessels, 1988; Wald, 1999). Smaller firms, on the other hand, may find it relatively more costly to resolve information asymmetries with lenders, thus, may present lower debt ratios (Castanias, 1983). Lenders to larger firms are more likely to get repaid than lenders to smaller firms, reducing the agency costs associated with debt. Therefore, larger firms will have higher debts. Another

explanation for smaller firms having lower debt ratios is if the relative bankruptcy costs are an inverse function of firm size (Titman and Wessels, 1988). It is generally believed that there are economies of scale in bankruptcy costs: larger firms face lower unit costs of bankruptcy than smaller firms, as shown in Prasad et al. (2001). Castanias (1983) also states that if the fixed portion of default costs tends to be large, then marginal default cost per dollar of debt may be lower and increase more slowly for larger firms. Facts about larger firms may be taken as evidence that these firms are less risky (Kim and Sorensen, 1986). Cosh and Hughes (1994) add that if operational risk is inversely related to firm size, this should rather predispose smaller firms to use relatively less debt.

Empirical evidence on the relationship between size and capital structure supports a positive relationship. Several works show a positive relationship between firm size and leverage (see Barclay and Smith, 1996; Friend and Lang, 1988; Barton et al., 1989; MacKie-Mason, 1990; Kim et al., 1998; Al-Sakran, 2001; Hovakimian et al., 2004). Their results suggest that smaller firms are more likely to use equity finance, while larger firms are more likely to issue debt rather than stock. In a Ghanaian study, Aryeetey et al. (1994) found that smaller enterprises have greater problems with credit than larger firms. Their results showed that the success rate for large firms applying for bank loans was higher than that of smaller firms. In a study of six African countries, Bigsten et al. (2000) also showed that about 64% of micro firms, 42% of small firms and 21% of medium firms appear constrained, while this is only 10% for the large firms. Cassar and Holmes (2003), Esperança et al. (2003), and Hall et al. (2004) found a positive association between firm size and long-term debt ratio, but a negative relationship between size and short-term debt ratio. Some studies also support a negative relationship between firm size and short-term debt ratio (Chittenden et al., 1996; Michaelas et al., 1999). According to Titman and Wessels (1988), small firms seem to use more short-term finance than their larger counterparts because smaller firms have higher transaction costs when they issue long-term debt or equity. They further add that such behaviour may cause a “small firm risk effect”, by borrowing more short term. These types of firms will be more sensitive to temporary economic downturns than larger, longer-gearred firms.

### **Asset structure**

The asset structure of a firm plays a significant role in determining its capital structure. The degree to which the firm's assets are tangible should result in the firm having greater liquidation value (Titman and Wessels, 1988; Harris and Raviv, 1991). Bradley et al. (1984) assert that firms that invest heavily in tangible assets also have higher financial leverage since they borrow at lower interest rates if their debt is secured with such assets. It is believed that debt may be more readily used if there are durable assets to serve as collateral (Wedig et al., 1988). By pledging the firm's assets as collateral, the costs associated with adverse selection and moral hazards are reduced. This will result in firms with assets that have greater liquidation value having relatively easier access to finance at lower cost, consequently leading to higher debt or outside financing in their capital structure. In the case of small firms, the concession of collateral reduces the under-investment problem in the firms by increasing the probability of obtaining credit – functioning also as a management instrument in conflicts between entrepreneur and

financiers, since the degree of the entrepreneurs' involvement in sharing business risk, by granting personal collateral, is clearly evident. It is further suggested that bank financing will depend upon whether the lending can be secured by tangible assets (Storey 1994; Berger and Udell 1998).

Empirical evidence suggests a positive relationship consistent with theoretical argument between asset structure and leverage for the firms (Bradley et al., 1984; Wedig et al., 1988; Friend and Lang, 1988; MacKie-Mason, 1990; Rajan and Zingales, 1995; Shyam-Sunder and Myers, 1999; Hovakimian et al., 2004). Kim and Sorensen (1986), however, found a significant and negative coefficient between depreciation expense as a percentage of total assets and financial leverage. Other studies specifically suggest a positive relationship between asset structure and long-term debt, and a negative relationship between asset structure and short-term debt (see Van der Wijst and Thurik, 1993; Chittenden et al., 1996; Jordan et al., 1998; Michaelas et al., 1999; Cassar and Holmes, 2003; Hall et al., 2004). Esperança et al. (2003) found positive relationships between asset structure and both long-term and short-term debt. Marsh (1982) also maintains that firms with few fixed assets are more likely to issue equity. In a similar work, MacKie-Mason (1990) concluded that a high fraction of plant and equipment (tangible assets) in the asset base makes the debt choice more likely. Booth et al. (2001) suggest that the relationship between tangible fixed assets and debt financing is related to the maturity structure of the debt. In such a situation, the level of tangible fixed assets may help firms to obtain more long-term debt, but the agency problems may become more severe with the more tangible fixed assets, because the information revealed about future profit is less in these firms. If this is the case, then it is likely to find a negative relationship between tangible fixed assets and debt ratio.

### ***Profitability***

The relationship between firm profitability and capital structure can be explained by the pecking order theory (POT) discussed above, which holds that firms prefer internal sources of finance to external sources. The order of the preference is from the one that is least sensitive (and least risky) to the one that is most sensitive (and most risky) that arise because of asymmetric information between corporate insiders and less well-informed market participants (Myers, 1984). By this token, profitable firms with access to retained profits can rely on them as opposed to depending on outside sources (debt). Murinde et al. (2004) observe that retentions are the principal source of finance. Titman and Wessels (1988) and Barton et al. (1989) agree that firms with high profit rates, all things being equal, would maintain relatively lower debt ratios since they are able to generate such funds from internal sources.

SMEs specifically face a more extreme version of the POT, described as a "constrained" POT by Holmes and Kent (1991) and a "modified" POT by Ang (1991). This is mainly because they have less access to external funds, debt as well as equity, than do large enterprises. The theory's application to SMEs implies that external equity finance issues may be inappropriate since these firms may not be listed on the stock market or may not qualify to go through private placements. However, the tax trade-off model predicts that profitable firms will employ more debt since they are more likely to have a high tax burden and low bankruptcy risk. Also, profitable firms are more capable

of tolerating more debt since they may be in a position to service their debt easily and on time. Profitable firms are more attractive to financial institutions as lending prospects, therefore they can always take on more debt capital (Ooi, 1999). Scherr et al. (1993) found that start-up firms with higher anticipated profitability have higher debt to equity ratios.

Empirical evidence from previous studies seems to be consistent with the pecking order theory. Most studies found a negative relationship between profitability and capital structure (see Friend and Lang, 1988; Barton et al., 1989; Van der Wijst and Thurik, 1993; Chittenden et al., 1996; Jordan et al., 1998; Shyam-Sunder and Myers, 1999; Mishra and McConaughy, 1999; Michaelas et al., 1999). Cassar and Holmes (2003), Esperança et al. (2003), and Hall et al. (2004) also suggest negative relationships between profitability and both long-term debt and short-term debt ratios. Petersen and Rajan (1994), however, found a significantly positive association between profitability and debt ratio.

### ***Firm growth***

Growth is likely to place a greater demand on internally generated funds and push the firm into borrowing (Hall et al., 2004). According to Marsh (1982), firms with high growth will capture relatively higher debt ratios. In the case of small firms with more concentrated ownership, it is expected that high growth firms will require more external financing and should display higher leverage (Heshmati, 2001). Aryeetey et al. (1994) maintain that growing SMEs appear more likely to use external finance – although it is difficult to determine whether finance induces growth or the opposite (or both). As enterprises grow through different stages, i.e., micro, small, medium and large scale, they are also expected to shift financing sources. They are first expected to move from internal sources to external sources (Aryeetey, 1998). There is also a relationship between the degree of previous growth and future growth. Michaelas et al. (1999) argue that future opportunities will be positively related to leverage, in particular short term leverage. They argue that the agency problem and consequently the cost of financing are reduced if the firm issues short-term debt rather than long-term debt. Myers (1977), however, holds the view that firms with growth opportunities will have a smaller proportion of debt in their capital structure. This is because conflicts of interest between debt and equity holders are especially serious for assets that give the firm the option to undertake such growth opportunities in the future. He argues further that growth opportunities can produce moral hazard situations and small-scale entrepreneurs have an incentive to take risks to grow. The benefits of this growth, if realized, will not be enjoyed by lenders who will only recover the amount of their loans, resulting in a clear agency problem. This will be reflected in increased costs of long-term debt that can be mitigated by the use of short-term debt.

Empirical evidence seems inconclusive. Some researchers found positive relationships between sales growth and leverage (see Kester, 1986; Titman and Wessels, 1988; Barton et al., 1989). Other evidence suggests that higher growth firms use less debt (see Kim and Sorensen, 1986; Stulz, 1990; Rajan and Zingales, 1995; Roden and Lewellen, 1995; Al-Sakran, 2001). Michaelas et al. (1999) found future growth to be positively related to leverage and long-term debt. Cassar and Holmes (2003) and Hall et al. (2004) showed

positive associations between growth and both long-term debt and short-term debt ratios, while Chittenden et al. (1996), Jordan et al. (1998), and Esperança et al. (2003) found mixed evidence.

It is also important to note that the dividend payout of the firm could affect choice of capital in financing growth. Generally, firms with low dividend payout are able to retain more profits for investments. Such firms would therefore depend more on internally generated funds and less on debt finance. On the other hand, firms with high dividend payout are expected to rely more on debt in order to finance their growth opportunities.

### ***Firm risk***

The level of risk is said to be one of the primary determinants of a firm's capital structure (Kale et al., 1991). The tax shelter-bankruptcy cost theory of capital structure determines a firm's optimal leverage as a function of business risk (Castanias, 1983). Given agency and bankruptcy costs, there are incentives for the firm not to fully utilize the tax benefits of 100% debt within the static framework model. The more likely a firm is exposed to such costs, the greater their incentive to reduce their level of debt within its capital structure. One firm variable that affects this exposure is the firm's operating risk; in that the more volatile the firm's earnings stream, the greater the chance of the firm defaulting and being exposed to such costs. According to Johnson (1997), firms with more volatile earnings growth may experience more situations in which cash flows are too low for debt service. Kim and Sorensen (1986) also observe that firms with a high degree of business risk have less capacity to sustain financial risks and thus use less debt.

Despite the broad consensus that firm risk is an important determinant of corporate debt policy, empirical investigation has led to contradictory results. A number of studies have indicated an inverse relationship between risk and debt ratio (see Bradley et al., 1984; Titman and Wessels, 1988; Friend and Lang, 1988; MacKie-Mason, 1990; Kale et al., 1991; Kim et al., 1998). Other studies suggest a positive relationship (Jordan et al., 1998; Michaelas et al., 1999). Esperança et al. (2003) also found positive associations between firm risk and both long-term and short-term debt.

### ***Taxation***

Numerous empirical studies have explored the impact of taxation on corporate financing decisions in the major industrial countries. Some are concerned directly with tax policy, for example: MacKie-Mason (1990), Shum (1996) and Graham (1999). MacKie-Mason (1990) studied the tax effect on corporate financing decisions and provided evidence of substantial tax effect on the choice between debt and equity. He concluded that changes in the marginal tax rate for any firm should affect financing decisions. When already exhausted (with loss carry forwards) or with a high probability of facing a zero tax rate, a firm with high tax shield is less likely to finance with debt. The reason is that tax shields lower the effective marginal tax rate on interest deduction. Graham (1999) concluded that in general, taxes do affect corporate financial decisions, but the magnitude of the effect is mostly "not large".

On the other hand, DeAngelo and Masulis (1980) show that there are other alternative tax shields such as depreciation, research and development expenses, investment deductions, etc., that could substitute the fiscal role of debt. Empirically, this substitution

effect is difficult to measure, as finding an accurate proxy for tax reduction that excludes the effect of economic depreciation and expenses is tedious (Titman and Wessels, 1998). Dammon and Senbet (1988) argue that there is also an income effect when investment decisions are made simultaneously with financing decisions. They suggest that increases in allowable investment-related tax shields due to changes in the corporate tax code are not necessarily associated with reduction in leverage at the individual firm level when investment is allowed to adjust optimally. They explain that the effect of such an increase depends critically on the trade off between the “substitution effect” advanced by DeAngelo and Masulis (1980) and the “income effect” associated with an increase in optimal investment.

### ***Managerial ownership***

Managerial insiders (officers and directors) have a somewhat different perspective since many of them have large portions of their personal wealth invested in the firm (Amihud and Lev, 1981; Friend and Hasbrouck, 1988). The personal wealth managerial insiders have invested in their employer is composed largely of their employer’s common stock and the firm-specific human capital they have accumulated while working for their employer. Since these items tend to represent a large proportion of an insider’s total wealth, the bankruptcy of the employer would have a major impact on their personal wealth. As a result, Friend and Hasbrouck (1988) argue, managerial insiders should be more sensitive to the bankruptcy risk that debt financing induces and more inclined to minimize this risk by using less than the shareholder wealth maximizing amount of debt in the firm’s capital structure. Further, the more wealth a managerial insider has invested in the employer, the greater the incentive they have to minimize the use of debt financing.

Noe and Rebello (1996) argue that the locus of control within a firm is an important determinant of choice of finance. When corporate decisions are dictated by the manager, equity issues will be favoured over debt because of the managers’ inclination to protect their undiversified human capital and to avoid the performance pressure associated with debt commitments (see Berger et al., 1997). However, if the locus of control rests with substantial shareholders that are not represented on the management board, especially of quoted firms, the company may take on more debt to limit the scope for managerial discretion. Previous empirical studies suggest that managerial ownership should be negatively related to debt use.

### ***Other factors***

Certain heterodox factors that are not typically included in conventional financial models are believed to also affect the capital structure decisions of SMEs. Green, Kimuyu, Manos and Murinde (2002), in analysing the financing behaviour of small enterprises in Kenya, used an eclectic but heterodox empirical model of the capital structure and financial decisions of micro and small enterprises. In this present study, as well, we include such factors as industry, location of the firm, entrepreneur’s educational background, gender of the entrepreneur, form of business and export status in explaining the financing decisions of SMEs in the sample. These are discussed later.

Variations due to industry effects are likely to be more pronounced for SMEs since most of them are “unitary firms” (Bolton, 1971) and this could have an impact on their

capital structure. Service businesses, for example, are less likely to be candidates for bank loans because they often lack assets that can be used as collateral (Hisrich, 1989; Riding et al., 1994). Correspondingly, businesses that are highly capital intensive such as manufacturing, transportation and construction, may be more likely to use external capital. Bradley et al. (1984) found that industry classification accounted for 25% of the variation in firm leverage, with capital intensive firms showing significantly higher leverage ratios. Scherr et al. (1993) also found industry effects in a study of the capital structure of start-ups. It is argued, however, that service businesses, because of the nature of their business, are able to return profits faster than manufacturing firms. This means they may be in a position to repay their debt on time and take on more debt.

The corporate finance literature is not very clear on the effect of location and the choice of finance. However, it is expected that firms close to the capital city or urban centre would have easier access to debt finance than those located outside the capital city.

The educational background of the entrepreneur is believed to be positively related to debt, implying that better educated owners do have greater possibilities of borrowing. Better educated owners would find it easier to present a plausible case for a loan to an outside body. This would be particularly important if the owner had no book-keeping knowledge. Overall, the level of education appears to have an important positive impact on micro and small enterprises' debt-raising capacities (Green, Kimuyu, Manos and Murinde, 2002).

Gender of the small business owner may affect the capital structure choice of the firm. It is argued that women-owned businesses are less likely to use debt for a variety of reasons, including discrimination and greater risk aversion (Riding and Swift, 1990; Brush, 1992; Scherr et al., 1993). In addition, women may not network as effectively as men (Aldrich, 1989; Brush, 1992) and therefore may not have the same access to sources of information and debt capital as men do. Thus, they may turn to informal sources of finance such as personal financial resources (Kalleberg and Leicht, 1991; Loscocco and Robinson, 1991). Aryeetey et al. (1994) agreed that the access of women entrepreneurs is limited principally by their concentration in smaller enterprises and their lack of fully-documented property as collateral.

The form of business could affect the debt-equity decisions of SMEs. Shareholders of corporations and limited companies have limited liability against losses, whereas general partners and owners of sole proprietorships have unlimited liability. Consequently, shareholder-creditor conflicts are more likely among corporations and limited companies than they are for general partners and sole proprietorships. Thus, corporations and limited liability companies may be more likely to finance their projects with equity, while sole proprietors are more likely to employ debt financing (Brewer et al., 1996).

Following from the reasoning of the trade-off model, it is posited that international diversification reduces the expected cost of bankruptcy and allows for increased debt capacity. Firms involved in export business tend to be more diversified and as such are capable of accommodating more debt capital (Abor, 2004), implying that debt ratio rises with increasing international activities. Thus, as firms engage more in international business (exporting), they tend to employ more debt.

### 3. Research Methodology

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We use a panel regression model for the estimation in this study. Panel data involves the pooling of observations on a cross-section of units over several time periods. A panel data approach is more useful than either cross-section or time-series data alone. One advantage of using the panel data set is that, because of the several data points, degrees of freedom are increased and collinearity among the explanatory variables is reduced, thus the efficiency of economic estimates is improved.

#### The Model

Panel data can also control for individual heterogeneity due to hidden factors, which, if neglected in time-series or cross-section estimations leads to biased results (Baltagi, 1995). The panel regression equation differs from a regular time-series or cross-section regression by the double subscript attached to each variable. The general form of the model can be specified as:

$$Y_{it} = \alpha + \beta X_{it} + e_{it} \quad (1)$$

with the subscript  $i$  denoting the cross-sectional dimension and  $t$  representing the time-series dimension. The left-hand variable,  $Y_{it}$ , represents the dependent variable in the model, which is the firm's debt ratios.  $X_{it}$  contains the set of explanatory variables in the estimation model,  $\alpha$  is the constant and  $\beta$  represents the coefficients.

The regression was carried out using a Prais–Winsten specification because this approach is useful for estimating linear cross-sectional time series models when the disturbances are assumed to be either heteroscedastic across panels or heteroscedastic and contemporaneously correlated across panels. Consideration of the correlation bias in the fixed effect was therefore a factor in the decision to do the estimation using a Prais–Winsten regression. Generally, the Prais–Winsten regression results show signs consistent with theoretical predictions. The regression model employed for this study is also in line with what was used in previous studies, with some modifications for the analysis.

The model for the empirical investigation for both quoted and unquoted firms is therefore given as follows:

$$LDR_{it} = \mathbf{b}_0 + \mathbf{b}_1 AG_{it} + \mathbf{b}_2 SZ_{it} + \mathbf{b}_3 AS_{it} + \mathbf{b}_4 PR_{it} + \mathbf{b}_5 GR_{it} + \mathbf{b}_6 DIV_{it} + \mathbf{b}_7 RK_{it} + \mathbf{b}_8 TX_{it} + \mathbf{b}_9 OWN_{it} + e \quad (2)$$

$$SDR_{it} = \mathbf{b}_0 + \mathbf{b}_1 AG_{it} + \mathbf{b}_2 SZ_{it} + \mathbf{b}_3 AS_{it} + \mathbf{b}_4 PR_{it} + \mathbf{b}_5 GR_{it} + \mathbf{b}_6 DIV_{it} + \mathbf{b}_7 RK_{it} + \mathbf{b}_8 TX_{it} + \mathbf{b}_9 OWN_{it} + e \quad (3)$$

where:

- $LDR_{it}$  = long-term debt ratio (long-term debt/equity + debt) for firm  $i$  in time  $t$   
 $SDR_{it}$  = short-term debt ratio (short-term debt/equity + debt) for firm  $i$  in time  $t$   
 $AG_{it}$  = number of years in business  
 $SZ_{it}$  = the size of the firm (log of total assets) for firm  $i$  in time  $t$   
 $AS_{it}$  = tangible fixed assets divided by total assets for firm  $i$  in time  $t$   
 $PR_{it}$  = earnings before interest and taxes divided by total assets for firm  $i$  in time  $t$   
 $GR_{it}$  = growth rate in sales for firm  $i$  in time  $t$   
 $DIV_{it}$  = dividend payable as a proportion of operating income for firm  $i$  in time  $t$ . This is included as a supplementary indicator of firm liquidity  
 $RK_{it}$  = absolute coefficient of variations in profits  
 $TX_{it}$  = the ratio of tax paid to operating income for firm  $i$  in time  $t$   
 $OWN_{it}$  = proportion of shares closely held for firm  $i$  in time  $t$   
 $e$  = the error term

In the case of the SME sample, the empirical model is given as:

$$LDR_{it} = \mathbf{b}_0 + \mathbf{b}_1 X_{it} + \mathbf{b}_2 H_{it} + e \quad (4)$$

$$SDR_{it} = \mathbf{b}_0 + \mathbf{b}_1 X_{it} + \mathbf{b}_2 H_{it} + e \quad (5)$$

where:

- $X$  = vector of conventional firm characteristics (as in equations 2 and 3).  
 $H$  = vector of heterodox factors

The exogenous variables consist of both the conventional and heterodox factors. These are:

- $X$  = made up of conventional or traditional factors (as stated in equations 2 and 3), including age, size, asset structure, profitability, growth, dividend, risk, tax and ownership  
 $H$  = made up of heterodox factors, including;  
 $IND$  = constructed as a categorical variable (= 0 if manufacturing, 1 if agriculture, 2 if construction and mining, 3 if hospitality, 4 if information and communication, 5 if pharmaceuticals and medical services, 6 if wholesale and retail trading, 7 if general business services)

- Location* = constructed as a categorical variable (= 0 if located in Accra, 1 if in Kumasi, 2 if in Cape Coast, 3 if in Koforidua, 4 if in Sunyani, 5 if in Tamale).
- Education* = measured as a dummy (= 1 if CEO has a degree or professional qualification, otherwise, 0)
- Gender* = constructed as a binary (= 1 if firm is male-owned, otherwise 0)
- Form* = constructed as a categorical variable (= 0 if sole proprietorship, 1 if partnership, 2 if limited liability company)
- Export* = constructed as a binary (= 1 if firm is engaged in exports, otherwise 0)

Measures of capital structure include long-term debt ratio and short-term debt ratio. Long-term debt is defined as the proportion of the company's total debt repayable beyond one year. Short-term debt is the proportion of the company's total debt repayable within one year. All capital structure measures are scaled by the book value of total assets in line with the argument by Myers (1984) that book values are proxies for the value of assets in place.

The study also examined the nature and differences in the capital structures of quoted firms, unquoted firms and SMEs. A *t*-test was used in this regard.

## Data source and sample

The empirical investigation on the determinants of capital structure sampled three groups of firms: quoted firms, large unquoted firms and SMEs. All firms that have been listed on the Ghana Stock Exchange (GSE) during the six-year period, 1998–2003, were sampled. Twenty-two firms qualified to be included in the study sample. Fifty-five unquoted companies were also selected and these include non-SMEs that are not listed on the GSE. These were sampled from the Association of Ghana Industries' database. The SMEs' sample was selected from the Association of Ghana Industries' database of firms and that of the National Board for Small-Scale Industries and was made up of 153 firms having fewer than 100 employees each. In all, a total of 230 firms was included in this study. The selection of the unquoted firms and SMEs was mainly based on firms for which we were able to obtain financial statements. The data for the empirical analysis were derived from the financial statements of these firms during the period 1998–2003. Information on the heterodox factors was obtained through a questionnaire survey. The field survey was carried out between June and September 2005.

## 4. Empirical results

Tables 1, 2 and 3 present the descriptive statistics for the three sample groups. Unquoted firms appear to have the highest long-term and short-term debt ratios (0.1075 for long-term and 0.5094 for short-term debts), followed by quoted firms (0.0975 for long-term and 0.4964 for short-term) and then SMEs (0.0520 for long-term and 0.3653 for short-term). The average ages of quoted firms, unquoted firms and SMEs are 38.5, 22.7 and 9.4 years, respectively. On the average, quoted firms appear to be the largest since they exhibit the highest asset value, followed by unquoted firms. SMEs have the lowest asset value.

**Table 1: Descriptive statistics of variables – Quoted firms**

Variable	Mean	Std. dev.	Min	Max	Observations
Long-term debt ratio	0.0975	0.1774	0	0.77	N = 132
Short-term debt ratio	0.4964	0.2258	0.09	0.93	N = 132
Age of the firm	38.5	21.3	6	107	N = 132
Log(Size)	25.3777	1.9605	21.4838	31.2495	N = 132
Asset structure	0.3692	0.2232	0.02	0.97	N = 132
Profitability	0.1163	0.1110	-0.14	0.54	N = 132
Growth	0.3614	0.5143	-0.75	4.85	N = 132
Dividend	0.3068	0.2812	0	0.8600	N = 132
Risk	0.0722	0.0778	0.0001	0.3684	N = 132
Tax	0.2372	0.1560	0	0.5800	N = 132
Ownership	0.0874	0.2118	0	0.8682	N = 132

**Table 2: Descriptive statistics of variables – Unquoted firms**

Variable	Mean	Std. dev.	Min	Max	Observations
Long-term debt ratio	0.1075	0.3423	0	0.7467	N = 230
Short-term debt ratio	0.5094	0.2758	0	0.9964	N = 230
Age of the firm	22.7	18.7	1	75	N = 230
Log(Size)	24.6687	2.1507	17.2568	34.4809	N = 230
Asset structure	0.4255	0.2686	0.0042	0.9809	N = 230
Profitability	0.0995	0.2844	-1.2914	3.3531	N = 230
Growth	0.5566	2.8669	-0.9838	36.3170	N = 230
Dividend	0.1525	0.2037	0	0.8283	N = 230
Risk	0.4339	0.9811	0	1.3357	N = 230
Tax	0.2788	0.1920	0.0008	0.8977	N = 230
Ownership	0.4558	0.4216	0	1	N = 230

**Table 3: Descriptive statistics of variables – SMEs**

Variable	Mean	Std. dev.	Min	Max	Observations
Long-term debt ratio	0.0520	0.1511	0	0.9909	N = 690
Short-term debt ratio	0.3653	0.2852	0	0.9998	N = 690
Age of the firm	9.4	6.9632	1	29	N = 690
Log(Size)	21.0479	1.8310	15.7910	27.5212	N = 690
Asset structure	0.4836	0.2946	0	0.9999	N = 690
Profitability	0.0925	0.3391	0	7.7480	N = 690
Growth	0.5039	1.0503	-1	13.8240	N = 690
Dividend	0.0049	0.0499	0	0.6986	N = 690
Risk	0.1111	0.4098	0	9	N = 690
Tax	0.2618	0.1522	0.0048	0.8289	N = 690
Ownership	0.5971	0.4909	0	1	N = 690
Education	0.6451	2.7709	0	1	N = 690
Gender	0.8327	0.3736	0	1	N = 690
Export	0.2829	0.4507	0	1	N = 690
Industry: Manufacturing	42.3%				N = 287
Agriculture	2.7%				N = 8
Construction & Mining	16.1%				N = 99
Hospitality	4.0%				N = 25
Information Technology	8.7%				N = 60
Pharmaceuticals & Medicals	13.0%				N = 40
Wholesale & retail trade	5.4%				N = 31
General business services	14.8%				N = 99
Location: Accra	86.6%				N = 551
Kumasi	3.4%				N = 26
Cape Coast	3.3%				N = 22
Koforidua	2.0%				N = 10
Sunyani	2.7%				N = 21
Tamale	2.0%				N = 15
Form: Sole proprietorship	9.2%				N = 47
Partnership	1.3%				N = 11
Limited liability company	89.5%				N = 597

Surprisingly, SMEs were found to have the highest fixed assets in their total assets, recording asset structure of 48.36%, while quoted firms show the lowest asset structure of 36.92%. Unquoted firms have an average asset structure of 42.55%. SMEs typically have low fixed assets because they are initially not in a position to finance the acquisition of more fixed assets.

In terms of profitability, quoted firms seem to be the most profitable with a mean return rate of 11.63%, followed by unquoted firms with mean profitability of 9.95%. The least profitable is the SME sample with a mean profitability of 9.25%. The fastest growing firms were found to be the unquoted firms, with 55.66% growth rate, and the second fastest is the SME group, also exhibiting a growth rate of 50.39%. The quoted firms may be experiencing stability in their growth, which could explain the low growth rate compared with the unquoted and SME samples.

Quoted firms record the highest dividend payout ratio (0.3068), followed by the unquoted firms (0.1525). Most of the SMEs in our sample did not pay dividends. It is not surprising to find that the unquoted firms are the most risky given that they are the

fastest growing. A plausible explanation is that high growth opportunities may provide enough incentive to management to undertake risky investments in order to grow the firm. Average tax rates for quoted firms, unquoted firms and SMEs are given as 23.72%, 27.88% and 26.18%, respectively. Less than 10% of listed firms' shares are owned by management. Unquoted firms have 45.58% of their shares being held by management, while the proportion of the SMEs' shares held by managerial shareholders is 59.71%.

Table 3 also presents the descriptive statistics of some unconventional factors that are relevant in explaining the capital structure decisions of SMEs. These include educational background of the entrepreneur, gender of the entrepreneur, ownership, export status, industry, location of the firm and the form of business. About 64.5%, representing more than half of the CEOs, have degree or professional qualification. The sampled SMEs were found to be mainly male-owned (83%) businesses. Only 28% of the SMEs are into exports. Looking at the industry classifications, the manufacturing industry show the highest percentage of the SMEs sampled with 42.3%, followed by the construction and mining industry (16.1%), general business services (14.8%), and pharmaceuticals and medicals (13%). The agriculture sector is the least represented, with only 2.7% of the total sample. The majority of the SMEs sampled are located in the capital city (88.6%) and are mainly limited liability companies (89.45%).

## Correlation analysis

In order to examine the possible degree of multi-collinearity among the regressors, correlation matrixes of the variables for quoted firms, unquoted firms and SMEs are included in tables 4, 5 and 6, respectively. With respect to the quoted firms' sample, the long-term debt ratio has significantly positive correlations with size and growth but has significantly negative correlations with age, profitability and tax. Short-term debt ratio exhibits a significantly positive correlation with age, dividend payout and tax, but significantly negative correlations with both asset structure and risk. For the unquoted firms' sample, long-term debt ratio is significantly and negatively related to profitability and ownership. The results show significantly positive correlations between short-term debt ratio and age, risk, tax and ownership, but negative correlations with size, asset structure and profitability.

In terms of the SME sample, the results show a statistically significant and positive correlation between long-term debt ratio and asset structure. Short-term debt ratio also registers significantly positive correlations with age, dividend payout, tax, education, and export, but shows a statistically significant negative correlation with asset structure, profitability and ownership. The high magnitude of the correlation coefficients between size and growth in the case of quoted firms and between dividends and risk in the case of unquoted firms indicates the presence of multi-collinearity. We subsequently dropped the growth variable in the quoted firms' model, and the dividend variable in the unquoted firms' model.

Table 4: Correlation matrix – Quoted firms

Variable	Long-term debt ratio	Short-term debt ratio	Age	Size	Asset structure	Profitability	Growth	Dividend	Risk	Tax	Ownership
Long-term debt ratio	1.0000										
Short-term debt ratio	-0.5311*	1.0000									
Age	-0.2913*	0.3837*	1.0000								
Size	0.2352*	-0.0021	0.0417	1.0000							
Asset structure	0.0503	-0.5751*	-0.1392	0.0882	1.0000						
Profitability	-0.2442*	-0.0067	0.1527*	-0.0325	0.0012	1.0000					
Growth	0.2028*	-0.1434	-0.0657	0.7059*	0.0776	0.1024	1.0000				
Dividend	-0.1190	0.1952*	0.3872*	-0.0854	-0.2922*	0.3251*	-0.1089	1.0000			
Risk	-0.1192	-0.1839*	-0.0402	0.0063	0.1501*	0.4523*	0.0876	0.1841*	1.0000		
Tax	-0.2554*	0.2528*	0.2671*	-0.0579	-0.3020*	0.1969*	-0.1037	0.3530*	-0.0666	1.0000	
Ownership	-0.1118	-0.0571	-0.0270	-0.0897	0.3064*	-0.3073*	-0.0112	-0.3815*	-0.0438	-0.1509	1.0000

\* significant at 1%, 5% or 10%.

Table 5: Correlation matrix – unquoted firms

Variable	Long-term debt ratio	Short-term debt ratio	Age	Size	Asset structure	Profitability	Growth	Dividend	Risk	Tax	Ownership
Long-term debt ratio	1.0000										
Short-term debt ratio	-0.0349	1.0000									
Age	0.0686	0.1687*	1.0000								
Size	-0.0285	-0.1793*	-0.1274	1.0000							
Asset structure	0.1013	-0.6520*	-0.1206	0.2080*	1.0000						
Profitability	-0.1631*	-0.1739*	-0.0093	-0.0346	-0.0126	1.0000					
Growth	-0.0112	0.0734	0.0482	0.0029	-0.0174	-0.0661	1.0000				
Dividend	0.0833	0.1562	0.3823	-0.0532	-0.1297	0.4371*	-0.0579	1.0000			
Risk	-0.0432	0.1526*	-0.0805	-0.0135	-0.1114*	0.0940	-0.0145	0.7389*	1.0000		
Tax	-0.0299	0.1444*	-0.0225	-0.0118	-0.2442*	-0.1010	-0.0334	0.3096*	0.0414	1.0000	
Ownership	-0.1402*	0.2495*	-0.1796*	-0.1098*	-0.1940*	-0.0052	0.0712	-0.2632*	-0.1384*	-0.1336*	1.0000

\* significant at, 1%, 5% or 10%.

Table 6: Correlation matrix – SMEs

	Long-term debt ratio	Short-term debt ratio	Age	Size	Asset structure	Profitability	Growth	Dividend	Risk	Tax	Ownership	Educational	Export
Long-term debt ratio	1.0000												
Short-term debt ratio	-0.1334*	1.0000											
Age	0.0254	0.2283*	1.0000										
Size	-0.0112	-0.0312	0.1335*	1.0000									
Asset structure	0.2238*	-0.5320*	-0.2511*	-0.0020	1.0000								
Profitability	-0.1643	-0.1980*	-0.0798*	0.0248	-0.0642*	1.0000							
Growth	-0.0003	-0.0354	-0.1232*	-0.0273	-0.0117	0.1280*	1.0000						
Dividend	-0.0350	0.0987*	0.0119	-0.0020	-0.0627	-0.0023	-0.0037	1.0000					
Risk	-0.0232	0.0091	-0.0292	-0.0031	-0.0099	0.3481*	0.3032*	-0.0204	1.0000				
Tax	-0.0146	0.2235*	0.0466	-0.0499	-0.2738*	-0.1172*	-0.0556	0.0861*	-0.0515	1.0000			
Ownership	-0.1088	-0.0813*	0.0095	-0.0579	-0.2897*	-0.0870*	0.0150	0.0587	0.0537	0.0418	1.0000		
Education	-0.0696	0.1669*	0.0964*	-0.0137	-0.0622	-0.0248	0.0201	0.0773*	-0.0589	0.0968*	-0.1978*	1.0000	
Export	-0.0313	0.0683*	0.0169	-0.0137	-0.0622	-0.0248	0.0201	-0.0367	-0.0005	0.0053	-0.0897*	0.1547*	1.0000

\* significant at, 1%, 5% or 10%.

## Difference in mean debt ratios across sample groups

Further analyses were carried out to test the differences in the mean values (using a *t*-test) among quoted firms, unquoted firms and SMEs. We specifically sought to find out whether there are differences in the debt ratios (capital structures) among the sample groups. The results are presented in Tables 7, 8 and 9.

**Table 7: Test between SMEs and unquoted firms with unequal variances**

Group	Long-term debt ratio	Short-term debt ratio	Total debt ratio
SMEs	0.0520	0.3653	0.4173
Unquoted firms	0.1075	0.5094	0.6169
t-statistics	-2.3611**	-6.7730***	-6.8251***

\*\*\*, \*\* significant at 1% and 5%, respectively.

The results indicated in Table 7 show statistically significant differences in the debt ratios between SMEs and unquoted firms. Unquoted firms seem to exhibit significantly higher debt ratios than SMEs, suggesting that unquoted firms are significantly more likely to attract debt in their capital structure than SMEs.

**Table 8: Test between SMEs and quoted firms with unequal variances**

Group	Long-term debt ratio	Short-term debt ratio	Total debt ratio
SMEs	0.0520	0.3653	0.4173
Quoted Firms	0.0975	0.4964	0.5939
t-statistics	-2.7528***	-5.8119***	-9.1926***

\*\*\* significant at 1%.

The results (in Table 8) also indicate statistically significant differences between the capital structure of quoted firms and that of SMEs. Large, publicly quoted companies seem to have more debt in their capital structure than SMEs. The test of difference between the mean capital structure of listed firms and that of SMEs suggests that access to debt finance could be significantly influenced by the size of the firm. This implies that debt financing actually increases with the size of the firm, since bigger companies tend to have relatively easier access to external debt finance than their SME counterparts. Clearly, the finding is consistent with the size effect in capital structure theories.

**Table 9: Test between unquoted firms and quoted firms with unequal variances**

Group	Long-term debt ratio	Short-term debt ratio	Total debt ratio
Unquoted firms	0.1075	0.5094	0.6169
Quoted firms	0.0975	0.4964	0.5939
t-statistics	0.3648	0.4882	0.6188

The results in Table 9 show that even though unquoted firms exhibit higher debt ratios or capital structure than those of quoted companies, the differences are not statistically significant. We can therefore not reject the null hypothesis that there is no statistically

significant difference in the mean debt ratios between unquoted firms and quoted firms. A plausible explanation is that large unquoted firms, although they do not use the public equity market, are mostly capable of generating equity finance through the private placement market. By reason of their size and business track record, they may also have equal access to the debt market just as listed firms.

The results also show that short-term debt represents about 36.53%, 50.94% and 49.64% of the total assets of SMEs, unquoted firms and quoted firms, respectively, while long-term debt represents 5.20%, 10.75% and 9.75% of the total assets of SMEs, unquoted firms and quoted firms, respectively. This clearly highlights the importance of short-term debt over long-term debt in financing Ghanaian firms. This finding is consistent with existing empirical evidence from other countries. (see Cassar and Holmes, 2003; Hall et al., 2004; Sogorb-Mira, 2005). Hall et al., (2004), for example, found that in countries such as Belgium, Germany, Spain, Ireland, Italy, the Netherlands, Portugal and UK, short-term debt is about three times more than long-term debt.

## Regression results

The regression results for the three sample groups are presented in Table 10. The results show that age of the firm has a statistically significant positive relationship to long-term debt ratio among SMEs. This indicates that older SMEs tend to depend more on long-term debt given that over time they are able to resolve issues of information asymmetry with lenders and present a good credit history.

**Table 10: Regression model results across sample groups**

Variable	SMEs		Unquoted firms		Quoted firms	
	Long-term debt ratio	Short-term debt ratio	Long-term debt ratio	Short-term debt ratio	Long-term debt ratio	Short-term debt ratio
Constant	-0.3849* (0.2171)	-0.6507 (0.4246)	0.6339** (0.2583)	-0.4456 (0.4967)	-0.3067 (0.2273)	-0.4243 (0.3442)
Age	0.0090* (0.0049)	0.0023 (0.0032)	-0.0017*** (0.0006)	-0.0003 (0.0015)	-0.0020** (0.0008)	0.0029 (0.0018)
Log(Size)	0.0002 (0.0149)	0.0679*** (0.0175)	-0.0236** (0.0099)	0.0114 (0.0187)	0.0215** (0.0084)	0.0392*** (0.0106)
Asset structure	-0.0137 (0.0292)	-0.3820*** (0.0627)	0.2534*** (0.0448)	-0.6524*** (0.1238)	0.2346*** (0.0610)	-0.6698*** (0.1057)
Profitability	-0.0325 (0.0271)	-0.3272*** (0.1149)	-0.0601*** (0.0132)	-0.0814** (0.0334)	-0.1582* (0.0888)	-0.4083** (0.1884)
Growth	0.0057 (0.0037)	0.0109** (0.0043)	0.0035*** (0.0005)	0.0002 (0.0019)		
Dividend					-0.1573*** (0.0397)	0.0790 (0.0735)
Risk	-0.0005* (0.0003)	0.0028*** (0.0006)	-0.0064*** (0.0014)	-0.0006 (0.0021)	-0.0035*** (0.0009)	0.0062* (0.0033)
Tax	0.0219 (0.0323)	0.1438** (0.0632)	0.0115 (0.0155)	-0.1282 (0.0911)	-0.2628*** (0.0810)	0.0351 (0.0708)
Ownership	0.1864 (0.1153)	-0.2935*** (0.0884)	-0.0766** (0.0305)	0.2890*** (0.0673)	-0.1324* (0.0798)	0.2139*** (0.7988)

*Continued*

**Table 10, continued**

Variable	SMEs		Unquoted firms		Quoted firms	
	Long-term debt ratio	Short-term debt ratio	Long-term debt ratio	Short-term debt ratio	Long-term debt ratio	Short-term debt ratio
Education	-0.0080 (0.0449)	-0.0791** (0.0345)				
Gender	0.1214** (0.0605)	0.0490 (0.0344)				
Export	0.0802* (0.0467)	-0.0324 (0.0645)				
Agriculture	0.7297*** (0.0808)	-0.1659** (0.0649)				
Construction & mining	0.1006 (0.0739)	-0.1075 (0.0710)				
Hospitality	0.2651 (0.1894)	-0.0659 (0.1267)				
Information technology	0.0500 (0.0333)	0.1055* (0.0562)				
Pharmaceutical & medicals	-0.0114 (0.0822)	-0.0771 (0.0891)				
Trading	-0.0752 (0.0481)	0.1092 (0.0704)				
General services	0.0741** (0.0294)	0.0476 (0.0923)				
Kumasi	0.0580 (0.0681)	-0.2065*** (0.0576)				
Cape Coast	-0.2456 (0.1797)	-0.0392 (0.0644)				
Koforidua	-0.6641*** (0.1651)	0.3127*** (0.0620)				
Sunyani	-0.2707** (0.1497)	-0.1740** (0.0746)				
Tamale	-0.1217*** (0.0434)	-0.3865*** (0.0590)				
Partnership	0.1952 (0.1652)	-0.0759 (0.0840)				
Limited liability	0.0605* (0.0349)	0.0211 (0.0547)				
R-squared	0.5402	0.8143	0.5842	0.8502	0.6737	0.9129
Wald chi <sup>2</sup> (25)(8)(8)	358856.77	9501.82	73.27	1395.97	72.85	
Prob > chi <sup>2</sup>	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Notes: Standard error, \*\*\*, \*\*, \* = significant at 1%, 5% and 10%, respectively. The model was estimated via the Prais–Winsten heteroscedastic method. Gender is a binary variable with male as the reference term. Export is a binary variable with exporters as the reference term. The industry category variable has manufacturing as the reference point. Accra is the reference point for the location category variable. The business form category variable has sole-proprietorship as the reference term.

Since SMEs do not have access to the public equity market, long years of business could connote long business relationships with external debt providers and that increases their chances of acquiring external long-term debt finance. This is consistent with Petersen and Rajan's (1994) argument, that older SMEs should have higher debt ratios since they

should be higher quality firms. However, the results reveal a statistically significant negative association between age and long-term debt ratio in the case of unquoted and quoted firms. This is expected for large firms and those listed on the stock market, in that over time they are often in the position of attracting more equity investors and therefore are able to capture high equity finance. While listed firms in Ghana are able to raise equity from the stock market, large unquoted firms in Ghana are able to access formal equity capital from institutional investors through private placements. Therefore, large unquoted and quoted firms with longer years of business are more likely to depend on equity. The relationship between age and short-term debt ratio is not significant in all the sample groups.

Size of the firm was found to have a significantly positive relationship to short-term debt ratio of SMEs. Size is also significantly and positively related to both long-term and short-term debt ratios of quoted firms. Relatively larger SMEs find it easier to access short-term credit (such as trade credits). With respect to quoted firms, the results indicate that larger firms are more likely to acquire both long-term and short-term debt finance in their operations. Past studies have also confirmed these findings (see Barclay and Smith, 1996; Friend and Lang, 1988; Barton et al., 1989; MacKie-Mason, 1990; Kim et al., 1998; Al-Sakran, 2001; Hovakimian et al., 2004). In the case of unquoted firms, the results suggest that relatively larger firms rely more on equity finance.

The results of this study show significantly positive relationships between asset structure and long-term debt ratio among quoted and unquoted firms, but negative associations with short-term debt ratio among all the sample groups. Consistent with the findings of previous studies, the relationship between asset structure and short-term debt ratio is negative and significant in all the sample groups. The findings generally signal the relevance of fixed assets (collateral) in securing long-term debt, especially among large firms as shown by the direct relationship between asset structure and long-term debt. With respect to the short-term debt, it is generally expected that firms tend to match their duration of assets and liabilities. This means that firms with more fixed assets rely more on long-term debt, while those with more current assets (or fewer fixed assets) depend more on short-term debt in financing their assets.

The results also reveal that both long-term and short-term debt ratios appear to have inverse associations with profitability in all the sample groups. The results of this study clearly support the pecking order hypothesis, in that profitable firms initially rely on less costly internally generated funds and subsequently look for external resources if additional funds are needed. It is expected that more profitable firms will require less debt finance. This is because profitable firms would have a preference for inside financing over outside debt financing, as the cost of external financing is greater for the firm. In the case of SMEs, given that they do not have access to public equity, the theoretical predictions that seem to explain their capital structure are the “constrained” POT by Holmes and Kent (1991) and a “modified” POT by Ang (1991). This means profitable SMEs will initially rely on retained earnings; if they are unable to do this, they will seek debt financing. This is consistent with previous findings by Esperança et al. (2003) and Hall et al. (2004).

The growth variable is significant and positively related to long-term debt for unquoted firms and the short-term debt ratio for SMEs. Large unquoted firms may actually require more debt finance in order to finance their growth and investment opportunities. With

respect to growing SMEs, we expect that they will depend more on short-term debt. We also found a negative relationship between dividend payments and long-term debt in the case of quoted firms. High dividend payments may suggest the firm is liquid enough to finance its growth from internal resources. Dividend payments and debt issues may also act as substitutes in mitigating agency problems. In the case of SMEs, very few firms in our sample paid dividends and therefore the variable was dropped in the estimation results.

The results show an inverse relationship between risk and long-term debt ratio in all the sample groups, implying that firms with high risk levels exhibit low long-term debt ratios. In other words, they may avoid accommodating more financial risk by employing less long-term debt. However, for SMEs and the quoted firms samples, the results indicate a positive relationship between risk and short-term debt ratio. This may suggest that higher risk may leave the indebted firms little choice but to demand short-term debt. This position is also supported by Esperança et al. (2003).

Tax was found to have a statistically significant positive relationship to short-term debt ratio among SMEs. This suggests that SMEs with high tax rates rely more on short-term debt. The results also show a significant and negative association between tax and long-term debt ratios of quoted firms.

In Ghana, the relationship could be attributable to the special tax rebate for quoted firms. Firms that go public tend to enjoy tax reduction compared to unlisted firms. Companies have an incentive to get listed given the tax incentive they receive. Thus, a general increase in corporate tax would be associated with increasing equity capital since firms would be encouraged to go public and enjoy the special tax rebate. This position appears to be contrary to traditional capital structure theory, but may be reasonable in the Ghanaian context. One needs to be cautious in generalizing the tax effect emanating from this study, however. Given that we were unable to determine the effect of personal tax because of lack of data, this could have an impact on our results.

The results on ownership seem to be mixed. In terms of SMEs, we found a significantly negative relationship to short-term debt ratio. This indicates that SMEs with high percentage of managerial shareholders depend less on short-term debt. In the quoted and unquoted firms samples, managerial ownership indicates a negative relationship to long-term debt ratio and a positive relationship to short-term debt ratio. It could be explained that large firms with high managerial shareholders are more cautious in employing more long-term debt in order to curtail the risk of bankruptcy and to avoid the pressure associated with debt use. It is argued, however, that managerial share ownership could provide managers with an incentive to use the appropriate amount of debt in the firm's capital structure. Managers who own shares of their company suffer wealth losses if the firm uses less than the optimal amount of debt financing. Therefore, from the results of our study, firms with high managerial ownership may employ more short-term debt.

In terms of the heterodox factors in the SMEs sample, the level of education is only significant in the short-term debt model, indicating that less educated entrepreneurs depend more on short-term debt. Gender was found to be statistically significant and positively related to long-term debt ratio, indicating that male-owned SMEs are significantly more likely to employ more long-term debt than female-owned SMEs. This appears to support the results of earlier studies that women entrepreneurs have greater difficulty accessing

debt finance (see Riding and Swift, 1990; Brush, 1992; Scherr et al., 1993; Aryeetey et al., 1994). Other studies attribute the causes to sexual stereotyping and discrimination in the lending process that place women at a disadvantage. Exporting firms were found to be significantly more likely to depend on long-term debt. This is because exporting firms are more diversified and may exhibit better cash flows compared with non exporting firms. This increases their ability to fulfil their debt obligations on time, thus increasing their access to more long-term credit.

With manufacturing as the reference, agriculture appears to be significantly and positively related to long-term ratio but negatively related to short-term debt. This suggests that the agriculture sector depends more on long-term debt than the manufacturing sector. This finding is not surprising in the case of Ghana where the government sees the agriculture sector as very strategic to the growth of the economy and as such seems to be providing much support for the industry through innovative financing schemes. Compared with manufacturing, information technology is significantly and positively related to only short-term debt ratio. General services industries also show a positive relationship to long-term debt. The signs for construction and mining, hospitality, pharmaceutical and medicals, trading, and general services industries are also not significant in either the long-term or short-term debt models.

With respect to location, Koforidua, Sunyani and Tamale exhibit statistically significant negative interactions with long-term debt compared with the reference point (Accra), but Koforidua shows positive relationship to the short-term debt ratio, while Kumasi, Sunyani and Tamale exhibit negative associations with the short-term debt ratio. The results generally suggest that SMEs located outside the capital city encounter greater difficulty in acquiring debt, especially long-term finance compared to their counterparts located in the capital city.

The results of this study also indicate that limited liability companies are significantly more likely to obtain long-term debt finance relative to sole-proprietorships. It is generally believed that sole proprietorships are smaller than limited liability companies in terms of asset value, sales volume and number of employees and therefore may encounter greater difficulties in accessing external debt finance compared with limited liability companies. The results signal the fact that limited liability companies may choose more risky projects and shareholders are capable of invoking their limited liability status in case of default and when the firm is being wound up. This finding contradicts our hypothesis and the position of Brewer et al. (1996).

## 5. Conclusions and implications

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This study examined the determinants of capital structure decisions of publicly quoted firms, large unquoted firms and SMEs in Ghana. Publicly quoted and large unquoted firms were found to have higher debt ratios than SMEs. Overall, listed and unquoted firms exhibit different financing behaviour from that of SMEs. Short-term debt constitutes a relatively high proportion of total debt of Ghanaian firms. The results indicate that older SMEs are more likely to rely on long-term debt finance. This is because they are often perceived to have better reputations with debt finance providers. Listed firms are better positioned to raise equity finance from the stock market, and large unquoted firms are also able to access equity finance from institutional investors usually through private placements.

Firm size was found to have a positive relationship to short-term debt ratio of SMEs and debt ratios of quoted firms, but negative with respect to long-term debt ratio in the case of unquoted firms. We also found that fixed assets are important in obtaining long-term debt. Clearly, firms tend to match their duration of assets and liabilities by financing their fixed assets with long-term debt and their current assets with short-term debt. The results of this study seem to support the pecking order hypothesis, given that both long-term and short-term debts have inverse associations with profitability in all the sample groups. Firm growth was found to have a positive association with long-term debt for the unquoted firms' sample and short-term debt ratio for SMEs. We found that firms with high risk profile avoid taking more financial risk by using less long-term debt. However, they are more likely to use short-term debt.

SMEs with high managerial shareholding rely less on short-term debt. In order to avoid the pressure and risk associated with debt use, quoted and unquoted firms with high managerial ownership depend less on long-term debt but rely more on short-term debt. Male-owned and exporting SMEs depend more on long-term debt finance than female-owned SMEs and non-exporting firms. Industry was found to be important in explaining the SMEs' capital structure. SMEs located outside the capital city depend less on debt finance. Limited liability companies are more likely to obtain long-term debt finance relative to sole-proprietorship businesses.

The results of this study have delivered some insights on the capital structure of Ghanaian firms. The issue of capital structure is an important strategic financing decision that firms have to make. Clearly, the pecking order theory appears to dominate the Ghanaian capital structure story. It is therefore important for policy to be directed at improving the information environment. Firms, especially SMEs, are encouraged to maintain proper records. Policy makers should place greater emphasis on the facilitation

of equity capital since it provides a base for further borrowing, reduces businesses' sensitivity to economic cycles, and provides unquoted firms with access to syndicates of private and institutional venture capital suppliers. There could also be policies intended to encourage unquoted firms to access public equity capital by, for example, reducing listing requirements and subsidizing flotation cost. It is appropriate to establish financing schemes to assist SMEs in specific industries, those owned by women and those located outside the capital. Considering that export-oriented firms and limited liability companies have easier access to finance, firms should think about entering the international markets and sole-proprietorships are encouraged to consider more organized forms of business.

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