



Industry classification and the capital structure of Ghanaian SMEs

Capital structure
of Ghanaian
SMEs

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Abstract

Purpose – This study seeks to examine the effect of industry classification on the capital structure of SMEs in Ghana.

Design/methodology/approach – The analytical technique employed is regression framework with various capital structure measures as dependent variables, and with industry as the independent variable. Analysis of variance (ANOVA) and other non-parametric tests were also used to examine the differences in the capital structure of the SMEs across industries.

Findings – The results of this study indicate that SMEs in the agricultural sector exhibit the highest capital structure and asset structure or collateral value, while the wholesale and retail trade industry have the lowest debt ratio and asset structure. The regression results indicate that agriculture and pharmaceutical and medical industries depend more on long-term and short-term debt than does the manufacturing sector. Information and communication, and wholesale and retail trade sectors are more likely to use short-term credit than the manufacturing sector. The results also show that the construction and mining industry is less likely to depend on short-term debt, while hotel and hospitality depend more on long-term debt and less on short-term finance. The results clearly indicate that industry effect is important in explaining the capital structure of SMEs and that there are variations in capital structure across the various industries.

Originality/value – The main value of this paper is the analysis of the effect of industry classification on SMEs' capital structure from the Ghanaian perspective. The study provides insights on the financing behaviour of SMEs across various industries in Ghana.

Keywords Capital structure, Ghana, Small to medium-sized enterprises, Economic sectors

Paper type Research paper

1. Introduction

The seminal work by Modigliani and Miller (1958) on capital structure presented the basis for the development of various theories in the area. Their initial theory of "capital structure irrelevance" suggests that financial leverage does not affect the firm's market value. Their theory, however, was based on very restrictive assumptions, such as, perfect capital markets, homogenous expectations, no taxes and no transaction costs, which do not hold in practice, Modigliani and Miller (1963) revised their earlier position by incorporating tax-shield benefit as a determinant of firms' capital structure. The main characteristic of taxation is that interest on debt is a tax-deductible expense and as such the use of much debt in firms' capital structure would lead to an increase in their tax-shield benefits, resulting in shareholder value maximization. Miller (1977) modified this within the statistic trade-off framework, which offsets the benefits of debt use against the cost of possible bankruptcy and agency relationships.

The concept of optimal capital structure is also expressed by Myers (1984) and Myers and Majluf (1984) based on the pecking order theory (POT), which suggests that firms will initially rely on internally generated funds, then they will turn to debt



finance 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 and that, firms would prefer internal sources to costly external finance (Myers and Majluf, 1984). Cosh and Hughes (1994) explain that the POT is also applicable to SMEs, however, they appear to 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) because they have less access to external funds than do large enterprises. The POT suggests that use of external funds is very much related to profitability on the basis that SMEs, particularly if they are not listed, will make use of internally generated funds as a first resort. This means those which make use of external funds will be those with a lower level of profit.

Discussions on capital structure of SMEs have included industry effect as a determinant of capital structure (Jordan *et al.*, 1998; Hall *et al.*, 2000). Bolton (1971) argues that industry classifications are more likely to affect the capital structure of SMEs given that most of them are unitary firms. It is argued that industry effect is associated with an expected linkage between the existence of tangible assets and levels of debt. This suggests that sectors with strong tangible asset holdings are expected to have higher average debt levels than is evident in sectors associated with intangible or risky assets. However, there has been some controversy and debate concerning the association between industry and capital structure ranging from comments suggesting differences across industries but consistency within industries to claims that industry is not as important as firm specific aspects (Gibson, 2002).

This current study attempts to contribute to the few empirical studies and to the debate on capital structure and industry classifications from a developing country perspective. The study examines the capital structure of Ghanaian SMEs across industries to find out whether differences exist. The study specifically examines the effect of industry classification on the capital structure of the SMEs. SMEs are vital for the growth and development of the Ghanaian economy because they encourage entrepreneurship, generate employment, and reduce poverty (Kayanula and Quartey, 2000; Tagoe *et al.*, 2005). SMEs are said to contribute about 70 percent to Ghana’s gross domestic product and account for about 92 percent of businesses in Ghana (Villars, 2004). The study is relevant in the Ghanaian context given the important role the private sector is expected to play as the engine of growth. Ghana is viewed as one of the rising economies in Africa.

The rest of the paper is organized as follows: Section 2 reviews the literature on industry and capital of SMEs. Section 3 includes the research methodology. Section 4 discusses the results of the study and Section 5 concludes the discussion.

2. Capital structure, industry and SMEs

The interest in SME capital structure has included consideration of whether industry plays a part in its determination (Jordan *et al.*, 1998). 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 instance are less likely to be candidates for bank loans because they often lack assets which 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 percent 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.

The crucial difference between the POT and the static trade-off theory of capital structure was that the POT suggested that debt ratios would be determined by firms' cumulative need for funds (Myers, 1984). According to Myers (1984), where the funds available were greater than what a firm actually required, the firm could invest the excess in some marketable securities. If the funds from retained profits were insufficient, the firms could depend on its deposits, and if that was still not enough, then it might consider borrowing followed by issuing hybrid securities and finally by issuing equity. He explained that a very profitable firm that is in an industry with low growth would have a high level of retained profits with relatively few opportunities for investment and would have low leverage. It would therefore not make sense for such a firm to borrow just to bring itself into line with the industry average.

Myers (1984) concluded that a long-run industry average would not be a meaningful target for individual firms in that industry because each firm's debt ratio reflects its cumulative requirements for external finance. The implication of this observation by Myers is that the industry in which a firm operates does not directly determine its capital structure but may do so indirectly through the nature and composition of the firm's assets. In other words, average debt ratios will vary from industry to industry because asset risk, asset type, and requirements for external funds vary by industry. Prior empirical studies have indicated that asset risk and asset type are amongst the most important determinants of capital structure (Harris and Raviv, 1991; Chittenden *et al.*, 1996; Michaelas *et al.*, 1999; Cassar and Holmes, 2003; Hall *et al.*, 2004). Balakrishnan and Fox (1993) argued that industry factors were not nearly as important as firm specific ones. Jordan *et al.* (1998) suggested that since SMEs often operate in niche markets, this would reduce the impact of broad industry influences on capital structure. They therefore hypothesize that the industry in which SMEs operate is not important in explaining their capital structure. In a study of financial structure of small- and large-Australian manufacturing firms, Holmes and Kent (1991) found that the financial structures of small and large firms in the manufacturing industry were different and that small firms operated under a "constraint" POT. This is mainly because SMEs have no access to capital market to raise external equity finance but simply rely on retained earnings, debt and additional investment by the owner-manager. Hall *et al.* (2000) also found significant variation across industries in most of the explanatory variables.

However, a number of reasons have been given with respect to the fact that the industry in which a firm operates will have a significant impact on its capital structure. For instance, Titman (1984) argues that the firm will choose a level of leverage that will maximize its liquidation costs. It is also hypothesized that if the probability of liquidation of a firm increases, this will reduce its current income stream. This effect may arise, according to Titman (1984), because post-liquidation, the after-sales service of the firm will effectively disappear. Prior to liquidation, therefore, consumers are less likely to purchase durable goods from the firm at risk, because of the expected increase in maintenance costs of the product, following the firm's disappearance. The more specialized the product, the lower is the liquidation value of the firm, because

the harder it is to replace the after-sales service. A priori, this suggests that there will be inter-industry differences in leverage across industries, as firms producing more specialized products seek a level of leverage to help offset their lower liquidation costs, *ceteris paribus* (Prasad *et al.*, 2001). It stands to reason that firms operating in different industries will exhibit different levels of debt in their capital structure.

Harris and Raviv (1991) suggest that the industry in which a firm operates does affect its capital structure directly. They argue that firms within an industry have more in common with each other than with firms in different industries and that there has been a persistent difference in industry debt ratios over time. For example, Bowen *et al.* (1982) and Bradley *et al.* (1984) observed that, drug, instrument, electronic, and food industry sectors have consistently low leverage whilst paper, textile, mill products, steel, airline, and cement industries have consistently high leverage. They also note that utilities are more heavily geared than non-utilities. Van der Wijst (1989) and Welsh and White (1981) reported that while the manufacturing industry is capital intensive and requires large investments in fixed assets derived from both debt and equity, negative relationship between short-term debt and the retail sector has been noted. Miller (1995) admits that the notion that the Modigliani and Miller (1958, 1963) propositions might apply to banks seems strange because demand deposits, which are by far the major source of funds for most banks, differ in so many ways from ordinary corporate securities. Miller (1995) concludes that the reason why the M and M propositions might not hold for banks was that the banking industry is highly regulated in a way that restricts capital structure choices. Other empirical efforts on factors influencing capital structure have included industry classification as a relevant factor (Remmers *et al.*, 1974; Errunza, 1979; Aggarwal, 1981). They found industry effect to be significant although not in every case examined. In comparing the financial structure of Australian and US SMEs, Gibson (2002) found that in Australia, mining and manufacturing firms were much more strongly represented and services were under represented compared with the US data. In both samples, there appeared to be a statistically significant difference in cluster membership according to industry sector. Short-term debt appeared to be more evident in the wholesale-trade and retail-trade sectors for both samples while there was a lower reliance on such debt in the services sectors. Mackay and Phillips (2003) opine that industry leverage is important since firms in the same industry are exposed to the same technology and therefore are likely to have a similar optimal financial structure. Boateng (2004) also focusing on international joint ventures showed that industries such as textiles, building and construction, mining and exploration have more debt in their capital structure compared to automobile, agriculture, food and transport. In a recent study, Johsen and McMahon (2005) confirmed that industry does appear to influence short-term debt, particularly for the construction and wholesale trade industries and possibly for cultural and recreational services. They also found that industry has an effect on long-term debt, particularly for manufacturing, retail trade, and transport and storage and possibly for the wholesale trade and finance and insurance industries.

The capital structure of SMEs is likely to be determined by a number of factors including age, size, assets structure, profitability, growth, and possibly industry (Hall *et al.*, 2000). We, therefore, hypothesize that there are differences in the capital structures of SMEs across industries.

3. Research data and methodology

This study sampled SMEs across various industries from the databases of the Association of Ghana Industries and the National Board for Small-Scale Industries. SMEs are defined as firms with less than 100 employees. A total of 150 SMEs were included in the study sample. The data used for the empirical analysis were derived from the annual reports of the SMEs during the six-year period, 1998-2003. The data were unbalanced panel. The SMEs are classified according to the Ghana Investment Promotion Council's industry classification. The composition of the sample is indicated in Table I.

With respect to the variables used in the analysis, the capital structure or debt ratio is defined in terms of short-term debt, long-term debt and total debt. Short-term debt is the proportion of the company's debt repayable with one year. This includes bank overdraft, bank loans payable within a year, and other current liabilities. Long-term debt is the firm's debt repayable beyond one year. This includes long-term bank loans and other long-term liabilities repayable beyond one year such as directors' loans, hire purchase and leasing obligations. The explanatory variables include industry dummy, age, size, asset structure, profitability, and growth. The industry variable is included to examine its effect on the SMEs' structure. The debt ratio is regressed against the explanatory variables. We employ feasible generalized least squares (FGLS) panel regression model, which is appropriate for unbalanced panel (Baltagi, 1995). This can be stated as:

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

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 ratio X_{it} contains the set of explanatory variables in the estimation model, α is the constant, and β represents the coefficients. Similar to most panel applications, we utilize a one-way error component model for the disturbances with $\mu_{it} = \mu_i + \nu_{it}$; where μ_i accounts for any unobservable firm-specific effects that is not included in the regression model and ν_{it} represents the remaining disturbances in the regression which varies with the individual firms and time. The regression model can be restated as:

$$\text{LDR}_{it} = \beta_0 + \beta_1 \text{IND}_{it} + \beta_2 C_{it} + \mu_{it} \quad (2)$$

$$\text{SDR}_{it} = \beta_0 + \beta_1 \text{IND}_{it} + \beta_2 C_{it} + \mu_{it} \quad (3)$$

$$\text{TDR}_{it} = \beta_0 + \beta_1 \text{IND}_{it} + \beta_2 C_{it} + \mu_{it} \quad (4)$$

| Industry | Number of firms | Percentage |
|-------------------------------------|-----------------|------------|
| Manufacturing | 33 | 22.0 |
| Agriculture | 6 | 4.0 |
| Construction and mining | 23 | 15.3 |
| Hotel and hospitality | 12 | 8.0 |
| Information and communication | 21 | 14.0 |
| Pharmaceutical and medical services | 15 | 10.0 |
| Wholesale and retail trade | 16 | 10.7 |
| General business services | 24 | 16.0 |
| Total | 150 | 100 |

Table I.
Composition of the
sample by industry

where SDR = short-term debt divided by total capital, LDR = long-term debt divided by total capital, TDR = total debt divided by total capital. The independent variables in the model are defined as: industry dummy (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). The control variables (C) include; firm age = number years since commencement of business, firm size = log of total assets, asset structure = fixed tangible assets divided by total assets (i.e. the proportion of total assets that has collateral value. It is a measure of the firm's collateral value), profitability = profit before interest and taxes/total assets, growth = average growth in sales.

To determine the differences in the capital structure across industries, the study made use of ANOVA to examine the nature and differences in the capital structure of the SMEs across industries. We also examine the differences in the firm-specific characteristics across the various industries. Specifically, we use *F*-test to compare the capital structure and the firm level variables for the various industries. The *F*-test takes the form:

$$F = \frac{SS_B/(G - 1)}{SS_W/(N - G)}$$

where; *N* is the total number of observations. The *F*-statistic has an *F*-distribution with *G*-1 numerator degrees of freedom and *N*-*G* denominator degrees of freedom under the null hypothesis of independent and identical normal distribution, with equal means and variances in each subgroup. We also report on the results of the Bartlett's test for equal variances. The Bartlett's test compares the logarithm of the weighted average variance with the weighted sum of the logarithms of the variances. Under the joint null hypothesis that the subgroup variances are equal and that the sample is normally distributed, the test statistic is approximately distributed as a χ^2 with *G*-1 degrees of freedom. Non-parametric methods (Kruskal-Wallis and Median tests) were then conducted to establish whether the model is robust under non-normality of data used. The results generally indicate that we can reject the hypothesis that the populations are the same.

4. Empirical findings

A summary of the descriptive statistics of the variables is presented in Table II. Average long-term debt, short-term debt, and total debt ratios are given as 0.0523,

| Variables | Mean (standard dev.) |
|-----------------------|---|
| Long-term debt ratio | 0.0523 (0.1487) |
| Short-term debt ratio | 0.3792 (0.2897) |
| Total debt ratio | 0.4315 (0.2971) |
| Firm age | 9.8 (7.5673) |
| Firm size | 8.53×10^{09} (4.29×10^{10}) |
| Asset structure | 0.4747 (0.2966) |
| Profitability | 0.0923 (0.3553) |
| Firm growth | 0.5576 (1.8490) |

Table II.
Means (and standard deviations) of variables for all firms

0.3792, and 0.4315, respectively. Average number of years is approximately 10 years. Average asset value is shown as 853,000,000,000 cedis[1]. On the average, 47.47 percent of SMEs' total assets took form as fixed assets. The mean profitability and growth rate in sales are also shown as 9.23 and 55.76 percent, respectively.

Table III illustrates the average leverage ratios across the various industries. The results show that debt ratio varies across the industries. Capital structure is statically and significantly different for long-term debt, short-term debt, and total debt ratios in all four statistical tests. Agriculture industry registers the highest average long-term debt ratio of 0.40. Long-term debt (0.0171) appears to be the least evident in the wholesale and retail-trade sector. This particularly true in the case of Ghana where the government sees the agriculture industry as very strategic to the growth of the economy and therefore seem to be providing much support for the industry through long-term financing schemes. With respect to short-term debt, wholesale and retail trade industry shows the highest average short-term debt ratio of 0.6212 and the hotel and hospitality industry, recording the lowest average short-term debt ratio of 0.2047. This position seems to support the results of Gibson (2002) for Australian and US SMEs. The result also indicates that wholesale and retail firms depend more on short-term lines of credit in financing their operations, considering that they often purchase on credit from their suppliers. The total debt is also significantly different across the various industries with the wholesale and retail-trade sector exhibiting the highest mean ratio of 0.6383 and the construction and mining industry showing the lowest mean ratio of 0.2446. The highest mean of total debt ratio for the wholesale and retail-trade industry could be simply due to the high ratio recorded for short-term debt.

The results of this study as illustrated in Table IV show that the determinants of SMEs' capital structure vary significantly across industries. All the variables were statistically significant for all the statistical tests except for profitability and growth which were insignificant in the *F*-test. Average age of the sample firms for instance is 13.7 years in the pharmaceutical and medical services industry compared to 5.7 years in the hotel and hospitality industry. Size of the SMEs varies significantly across industries.

| Industry | Leverage: long-term debt ratio | Leverage: short-term debt ratio | Leverage: total debt ratio |
|-------------------------------------|-----------------------------------|------------------------------------|-------------------------------|
| Manufacturing | 0.0365 | 0.3882 | 0.4247 |
| Agriculture | 0.4005 | 0.3766 | 0.7771 |
| Construction and mining | 0.0204 | 0.2406 | 0.2466 |
| Hotel and hospitality | 0.1675 | 0.2047 | 0.3722 |
| Information and communication | 0.0994 | 0.4016 | 0.5010 |
| Pharmaceutical and medical services | 0.0690 | 0.5707 | 0.6397 |
| Wholesale and retail trade | 0.0171 | 0.6212 | 0.6383 |
| General business services | 0.0402 | 0.3604 | 0.4006 |
| ANOVA (<i>F</i> -statistics) | 16.3242* | 12.1397* | 11.8588* |
| Bartlett's test: χ^2 | 217.4077* | 24.2595* | 19.0469* |
| Kruskal Wallis test: χ^2 | 42.111* | 76.263* | 82.171* |
| Median test: χ^2 | 81.2323* | 47.9475* | 55.3214* |

Note: *Significant at 1 percent level

Table III.
Average leverage ratios
across industries

| Industry | Age | Size (€) | Asset structure | Profitability | Growth |
|-------------------------------|-----------|-------------------------|-----------------|---------------|------------|
| Manufacturing | 10.1837 | 7.11×10^{09} | 0.4674 | 0.0970 | 0.6136 |
| Agriculture | 9.7857 | 6.68×10^{09} | 0.8378 | 0.0009 | 0.4020 |
| Construction and mining | 7.1053 | 5.77×10^{09} | 0.4726 | 0.1785 | 0.5647 |
| Hotel and hospitality | 5.7143 | 1.62×10^{09} | 0.7318 | 0.1005 | 0.3866 |
| Information and communication | 7.0159 | 2.40×10^{09} | 0.5508 | 0.0628 | 0.6038 |
| Pharmaceutical and medicals | 13.6744 | 6.27×10^{09} | 0.2858 | 0.0408 | 0.8111 |
| Wholesale and retail trade | 10.8571 | 5.50×10^{09} | 0.1912 | 0.0732 | 0.4163 |
| General business services | 11.1633 | 4.06×10^{09} | 0.5166 | 0.0553 | 0.3437 |
| ANOVA: F -statistics | 5.7179** | 6.6572** | 15.7979** | 1.4219 | 0.3524 |
| Bartlett's test: χ^2 | 41.1222** | 1.9×10^{03} ** | 25.9240** | 5333.6273** | 233.4496** |
| Kruskal Wallis test: χ^2 | 43.640** | 26.584** | 107.553** | 32.035** | 12.065* |
| Median test: χ^2 | 38.3861** | 36.9869** | 70.5690** | 34.5529** | 12.4936* |

Table IV.
Mean variables across industries

Note: *, **Significant at 1 and 10 percent levels, respectively

The manufacturing industry seems to be the biggest industry followed by agriculture, pharmaceutical and medical, construction and mining, wholesale and retail trade, and general business services. The youngest and smallest industry, which is the hospitality industry is now gradually picking up in Ghana.

Asset structure also varies significantly across industries with the agriculture industry exhibiting the highest average asset structure ratio of 0.8378 compared to only 0.1912 in the wholesale and retail trade industry. This appears to support our finding with respect to long-term debt ratio (Table III). The agriculture industry which demonstrates the highest long-term debt ratio also have the highest asset structure or collateral value, while the wholesale and retail trade with the lowest long-term debt ratio have the lowest collateral. Clearly, the wholesale- and retail-trade industry has the highest proportion of current assets and that possibly explains their reliance on more short-term debt. This supports the asset maturity principle, in that, firms with more current assets depend more on short-term debt, while those with more fixed assets rely more on long-term debt. It is obvious that industries that have high-collateral value are capable of attracting more long-term debt. This finding demonstrates the importance of tangible fixed assets or collateral as a requirement for accessing long-term debt. The other variables (profit and growth) were not significant in the F -test. However, the results from the other three statistical tests suggest that both profitability and growth do vary significantly across industry classification.

The results of the FGLS heteroscedastic consistent panel regression are shown in Table V. Using manufacturing as the reference, agriculture and pharmaceutical and medicals appear to be significantly and positively related to all the debt ratios. This suggests that agriculture, and pharmaceutical and medical industries depend more on long-term and short-term debt compared to the manufacturing sector. These industries are very crucial to the Ghanaian economy and are more likely to have easier access to external debt finance. Compared to manufacturing, information and communication, and wholesale and retail trade are significantly and positively associated with short-term debt ratio. Information and communication, and wholesale and retail trade

| Variables | Long-term debt ratio (standard error) | Short-term debt ratio (standard error) | Total debt ratio (standard error) |
|-------------------------------|--|---|--------------------------------------|
| Agriculture | 0.5754 *** (0.0507) | 0.1544 *** (0.0347) | 0.1069 * (0.0626) |
| Construction and mining | -0.0049 (0.0033) | -0.0871 *** (0.0158) | -0.1184 *** (0.0182) |
| Hotel and hospitality | 0.0570 * (0.0344) | -0.0732 *** (0.0258) | -0.0833 (0.0513) |
| Information and communication | 0.0119 (0.0117) | 0.1076 *** (0.0195) | 0.1440 *** (0.0232) |
| Pharmaceutical and medicals | 0.0476 *** (0.0089) | 0.0695 ** (0.0293) | 0.1016 *** (0.0120) |
| Wholesale and retail trade | -0.0026 (0.0028) | 0.1384 *** (0.0272) | 0.1543 *** (0.0322) |
| General business services | -0.0038 (0.0025) | 0.0223 (0.0162) | -0.0063 (0.0188) |
| Age | 0.0001 (0.0002) | 0.0015 (0.0010) | 0.0028 *** (0.0010) |
| Log(size) | 0.0020 *** (0.0007) | 0.0288 *** (0.0034) | 0.0460 *** (0.0038) |
| Asset structure | 0.0169 *** (0.0056) | -0.5283 *** (0.0219) | -0.4422 *** (0.0240) |
| Profitability | -0.0178 * (0.0099) | -0.1970 *** (0.0421) | -0.2033 *** (0.0414) |
| Growth | 0.0008 (0.0007) | 0.0051 ** (0.0022) | 0.0046 *** (0.0018) |
| Constant | -0.0421 *** (0.0143) | 0.0001 (0.0780) | -0.3786 *** (0.0864) |
| Log likelihood | 852.61 | 171.97 | 136.11 |
| Wald χ^2 (12) | 194.35 | 1918.59 | 1524.60 |
| Prob > χ^2 | 0.0000 | 0.0000 | 0.0000 |

Notes: *, **, *** significant at 1, 5 and 10 percent, respectively. The model was estimated via FGLS heteroscedastic method. Industry is a categorical variable with manufacturing as the reference point

Table V.
Regression model results

are more likely to employ short-term credit than the manufacturing industry. Total debt ratio was found to be significantly and positively related with these two industries. These sectors especially, the wholesale and retail trade mostly depend on short-term credit in financing their operations, given that they finance their purchases with supplier credits. The relationship with long-term debt ratio was however not significant in the model for the information and communication, and wholesale and retail trade industries.

Again, with manufacturing industry as the reference point, construction and mining has significantly negative relationships with both short-term debt and total debt ratios. This indicates that, compared to the manufacturing industry, construction and mining industry is significantly less likely to depend on short-term debts. Construction and mining was not significant in the long-term debt model. Hotel and hospitality show a statistically significant and positive relationship with long-term debt ratio but a significantly negative association with short-term debt ratio. This also indicates that, compared to the manufacturing industry, hotel and hospitality is significantly more likely to depend on long-term debt finance, but it is less likely to employ short-term debt as evidenced by the negative relationship. Even though the relationship with total debt ratio is negative, this was not significant in the regression results. In terms of the relationships between the general business services industry and debt ratio, the results of this study did not show statistical significance in all the debt ratios. Generally, these results support the industry effect reported by Bowen *et al.* (1982), Bradley *et al.* (1984), Hall *et al.* (2000) and Gibson (2002).

By and large, the other variables show signs which are typical in standard capital structure model. The positive relationship between size and both long- and short-term debt suggests that larger companies depend more on debt finance than smaller one. Asset structure is usually expected to be positively related to debt because the higher the value of a firm's tangible fixed assets or collateral, the greater its chance of obtaining long-term debt. The statistically significant inverse relationship between asset structure and short-term debt is consistent with firms matching the duration of their assets and liabilities. SMEs with a lower proportion of fixed assets or higher proportion of current assets are more likely to depend on short-term debt funding for their operations. The negative relationship between profitability and debt ratios is explained by the POT. SMEs with the capacity to generate funds internally rely less on debt. Though profitable firms may seem more attractive for debt finance providers, such firms may require less debt if they have sufficient retained earnings to finance their growth and investments. Age was found to have significantly positive relationship with only total debt ratio. Growth shows significantly positive associations with both short-term and total debt ratios.

5. Summary and conclusion

This paper analyzed the capital structure of SMEs in Ghana by examining the effect of industry classification on their capital structure. The results of this study suggest that SMEs' capital structures vary across industries and that industries with high-collateral value are often capable of attracting more long-term debt. In the Ghanaian case, the agriculture industry appears to have the highest asset structure or collateral and thus exhibit the highest long-term debt ratio. The results clearly demonstrate the importance of collateral in accessing long-term debt. Another explanation for the high long-term ratio is the existence of the government's financing initiatives directed at

promoting the agriculture sector. The wholesale and retail trade industry has the lowest proportion of fixed assets and highest proportion of current assets, thus seems to use more short-term debt in financing their operations. This is expected given that firms engaged in trading often depend on trade credits from their suppliers. The regression results indicate that the agriculture and pharmaceutical and medical industries depend more on long-term and short-term debt than does the manufacturing sector. Information and communication and wholesale and retail trade were found to be more likely to use short-term credit than does the manufacturing industry. The results also show that compared to the manufacturing industry, construction and mining industry is less likely to depend on short-term debt. The hotel and hospitality is more likely to depend on long-term debt finance but less likely to depend on short-term debt. The results confirm our hypothesis and also support the results of some previous empirical works in this area (Aggarwal, 1981; Welsh and White, 1981; Bowen *et al.*, 1982; Bradley *et al.*, 1984; Van der Wijst, 1989; Hall *et al.* (2000); Johsen and McMahon, 2005).

The results of this study broadly support the argument that industry effect is important in explaining the capital structure of SMEs and that there are variations in capital structure across various industries. The implication of this study is in respect of the fact that industry differences need to be considered in fashioning out financing schemes for SMEs. It is however important for further studies in this area to firm up these results for a more proactive policy direction.

Note

1. Ghanaian local currency.

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