Factors Influencing Capital Structure Choices in Ghanaian Manufacturing Small and Medium Enterprises (Smes): A Regional Perspective from Greater Accra

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Abstract

The paper investigates the factors influencing the financial leverage composition of small and medium-sized enterprises in the Greater Accra Region. Given the sector's significant contribution to Ghana's GDP, understanding its capital structure is crucial for the country's economic growth. A sample of 50 manufacturing SMEs was randomly selected, and data was collected through a structured questionnaire. Stata was used to analyse the data. The findings indicate that asset structure negatively impacts capital structure, whereas firm size, profitability, and interest rates have positive effects. Conversely, a negative correlation is found between firm age and financial leverage composition. The research outcomes suggest that policymakers encourage firms to optimize their asset structure, promote firms' growth and development, and foster a conducive business environment. Regulatory bodies should review and revise regulatory frameworks, provide incentives for firm growth, and monitor and regulate interest rates.

Keywords: Financial Policy, Firm Performance Studies, Financial Management, Small and Medium Enterprises.

1. Introduction

It is important to understand how businesses finance their investment needs and also the various factors that they have to consider in raising those funds. Therefore, financial managers have to consider finance options that will maximise shareholders' wealth (Brealey, Myers, & Allen, 2017). However, the decision on capital structure is complex, considering many factors such as firm size, asset structure, profitability, and interest rates (Myers, 1984; Rajan & Zingales, 1995).

Ghana's manufacturing SMEs contribute significantly to the growth and development, making their capital structure decisions crucial (Ghana Statistical Service, 2020). SMEs are the driving force behind many economies, fostering employment, innovation, and economic expansion. In Ghana, they comprise approximately 85% of all businesses and provide livelihoods for around 60% of the workforce (Ghana Statistical Service, 2020). However, Ghanaian SMEs face significant hurdles, including restricted access to funding, elevated interest rates, and inadequate financial support systems.

Ghanaian SMEs encounter substantial obstacles in securing financial resources, which can impede their expansion and progress (World Bank, 2019). Investigating the key drivers of financial leverage composition decisions in Ghana's SMEs can offer crucial knowledge for stakeholders, including policymakers, industry experts, and researchers, aiming to foster the sector's growth and development.

The Region, as Ghana's commercial nerve centre, offers a distinct setting for this research (Ghana Investment Promotion Centre, 2020). The paper seeks to present fresh empirical insights from the manufacturing SME sector in the Greater Accra Region of Ghana.

The study poses the following main and specific research questions:

Main question: What factors influence capital structure decisions among manufacturing SMEs in the Greater Accra Region?

Specific question:

What influence do internal elements, including firm size, age, composition of assets, and profitability on the capital structure decisions of businesses?

What role do interest rates play in shaping capital structure decisions?

This study will contribute to the understanding of capital structure decisions among SMEs in Ghana. The research outcomes will offer actionable recommendations for stakeholders, including SME entrepreneurs, investors, and government agencies to promote the sector's sustainable growth, ultimately contributing to Ghana's broader economic development and prosperity.

The subsequent sections of this study will comprise a detailed examination of existing research, a description of the methodological approach, a presentation of the empirical findings, an analysis of the results, and finally, suggestions for stakeholders, including policymakers, and industry experts.

2. Review of Existing Research

2.1 Introduction

The capital structure decisions made by SMEs have far-reaching implications, impacting their capital costs, risk exposure, and overall capacity to realize strategic goals. This review seeks to synthesize the existing body of research on this topic within the SME sector, with a specific focus on Ghana and the global context.

2.2 Overview of the SME Sector in Ghana

The history of this sector in Ghana is a fascinating one. Before Ghana gained independence in 1957, the country had a thriving entrepreneurial spirit, as exemplified by the Asante Kingdom. However, after independence, the development of SMEs took a hit during the era of Ghana's first president, Kwame Nkrumah. Nkrumah viewed business-minded entrepreneurs as a threat and implemented stringent measures to collapse many SMEs.

Despite these challenges, the 1980s saw a resurgence of SMEs in Ghana. The decline of large-scale manufacturing firms led to a surge in entrepreneurship, as formal sector workers sought alternative revenue streams. This led to the establishment of more businesses, laying the foundation for Ghana's vibrant SME sector today (GCB, 2023).

2.3 Definition of SMEs in Ghana

The below indicators are used to describe and define SMEs in Ghana
• Employment size for small enterprises is between 6 and 30, and medium enterprise employees are between 31 and 100.
•Enterprise turnover and assets for small enterprises are between US$25,001 and US$1,000,000. Enterprise turnover and assets for medium enterprises are between US$1,000,001 and US$3,000,000 (Ghana Enterprise Agency, 2024).

2.4 Conceptual Foundations of Capital Structure Decision-Making

Numerous conceptual models have emerged to elucidate the determinants of capital structure choices. Key frameworks include:

Myers (1984) introduced the pecking order theory, which posits that companies tend to favour funding within rather than seeking financing outside. SMEs in Ghana may rely heavily on internal financing due to limited access to external funding (AGI, 2022).

Kraus and Litzenberger (1973) developed the trade-off theory, suggesting that firms balance the benefits of loan financing, including tax advantages, in contradiction of potential drawbacks, such as increased vulnerability to monetary instability. Ghanaian SMEs may face high bankruptcy risks due to economic instability (World Bank, 2021).

Jensen and Meckling (1976) pioneered the agency theory, indicating that decisions regarding financial leverage compositions are shaped by the conflicting interests between shareholders and managers. In the context of Ghanaian SMEs, agency issues may arise due to inadequate corporate governance frameworks.

The theories were developed to strengthen the capital choices of businesses for growth and sustainability.

2.5 Empirical evidence of capital structure

Agyei-Mensah (2023) conducted a study investigating the factors that shape capital structure choices among Ghanaian SMEs between 2015 and 2020. The findings reveal that variables such as inflation, performance, and asset composition statistically impact Ghanaian SME's financial composition choices. Amoako (2021) concludes that high interest rates lead to a decrease in debt financing among Ghanaian SMEs. Ofori-Boateng and Asare (2020) investigated the link between capital structure and firm performance in Ghanaian SMEs. Their findings indicate that a higher proportion of debt financing relative to equity is positively correlated with improved firm performance.

Herosian et al. (2021) conducted a study on a sample of nine firms in Indonesia. Their analysis revealed that variables such as asset composition, liquidity levels, and profitability have a significant impact on the firm's sources of finance.

Umer (2020) discovered that specific firm attributes, such as company politics, economic environment, and inflation, are positively linked to companies in Ethiopia. Contrarily, factors like dividend distribution, profitability, and earnings volatility were found to negatively impact leverage. Putra et al, (2021) further indicated that manufacturing companies listed on the Indonesia Stock Exchange profit and capital structure were affected by factors such as companies' management level of education and business risk.

According to Rahaya and Darin (2020), the efficiency of manufacturing companies is affected by growth and profitability. Karthik (2017) indicated that factors such as growth opportunity, risk, tax, dividend, and interest affect leverage, but on different levels. Hertina et al. (2021) also concluded that how companies finance themselves in Nigeria is affected by factors like profitability, firm size, specifically, firm value is positively influenced by profitability partially, but firm value is significantly influenced by firm size. Hwee (2023) concluded that the companies in Indonesia are not affected by factors like external and economic environment. However, ownership and size.

Usman (2023) concluded that factors like profitability, growth, and size of the firm have an impact on the firm's value. According to Harris and Raviv (2018), larger firms have more debt in their capital structure due to their ability to borrow at lower costs. Boyle and Eckhold (2018), also concluded that more profitable firms tend to have lower debt levels as they have more internal funds available for financing

This literature provides an overview of the existing research on capital structure decisions among Ghanaian SMEs. Empirical evidence underscores the significance of internal firm attributes, external influences, and financial systems in determining capital structure choices. To deepen understanding, additional research is warranted to investigate the capital structure decisions of Ghanaian SMEs.

2.6 Hypotheses
The following hypotheses have been set based on the research questions and the literature reviewed.
2.6.1. Firm Size (FS): It is anticipated that a direct correlation exists between a company's scale and its capital structure composition.
2.6.2 Age (A): A firm's age is anticipated to exhibit a direct relationship with financial composition, as more established companies are likely to have cultivated strong relationships with lenders, thereby facilitating greater access to debt financing.
2.6.3. Interest Rate (IR): It is anticipated that higher interest rates will be inversely related to debt financing attractiveness, making it more costly and thereby influencing capital structure decisions.
2.6.4 Profitability (PR): Firms with higher profitability are likely to have a greater pool of internal funds, enabling them not to depend heavily on borrowing.
2.6.5 Asset Structure (AS): Companies with a higher concentration of tangible assets are likely to exhibit a greater reliance on debt financing, as these assets often require significant upfront investment, shaping the company's capital structure.

3. Research Methodology
3.1 Introduction
This involves the systematic and structured approach used to conduct research studies, encompassing the selection of research design, sampling methods, data collection and analysis techniques, and research instruments.

3.2 Study Approach
The study employs a quantitative research approach to examine the financial composition of SMEs in the manufacturing sector in the Greater Accra Region. Specifically, the study employs the Generalized Least Squares (GLS) method of estimation using Stata. The study first used the OLS method of estimation.

3.3 The area covered under the research
This research focused on manufacturing firms in Ghana's Greater Accra Region, a sector that is pivotal to the country's economic development. As reported by the Ghana Statistical Service (2022), the manufacturing sector is a key driver of Ghana's economic growth. The sector's contribution has been increasing over the years. As of recent data, the sector contributed approximately GHS5,023,470,000.00 to Ghana's gross domestic product, and this necessitated the choice of this sector The Greater Accra Region was also selected for the study because it is the hub of commercial centre in Ghana.

3.4 Population of the study
The population of the study was 9,835 manufacturing SMEs based on data from the Ghana National Chamber of Commerce and Industry (GNCCI), which was established by the Legislative Instrument (LI 611) in 1968 to promote business entities in Ghana. The data from GNCCI was chosen because its members are active in business, and the results will have a true reflection of businesses.

3.5 Sample size technique
Yamane's formula was adopted to obtain the sample size for this particular study.
Yamane's formula can be mathematically represented as:
n = Sample size adjustment factor
$n = N / (1 + (N \times (e^2 / N_2))$
Where:
N_1 = Sample size (52)
N_2 = Population size (9,835)
e= margin of error (5%)
Based on this formula with a significance level of 95%, a sample size of approximately 52 was obtained for the study.

3.6 Sample technique
This study utilized a simple random sampling technique, where every business had an equal probability of selection, aligning with the principles outlined by (Yamane,1967; Cochran,1977; Kothari (2004).

3.7 Data collection method
Information for the study was obtained through direct interviews with the respondents. The questionnaire was closed-ended and quantitative. The questionnaire was directed to the management staff of the selected companies. The consent

of respondents was sought before the questionnaire was administered. The data collection covered two months with support from one research assistant.

3.8 Model specification
The dependent variable, Capital Structure (CS), is modelled as a function of firm-specific characteristics and external factors.
$$CS = \beta_0 + \beta_1(FS) + \beta_2(FA) + \beta_3(IR) + \beta_4(PR) + \beta_5(AS) + \varepsilon$$

3.9 Variable definitions
• CS: Leverage Ratio (Debt to Equity)
• FS: Size of the Firm
• FA: Firm Age (years since establishment)
• IR: Interest Rate (lending rate of commercial banks)
• PR: Profitability (return on equity)
• AS: Asset Structure (ratio of fixed assets to total assets)
• ε: Error term

3.10 Summary statistics
Table 1 provides an overview of the key characteristics of the dataset, which was compiled from manufacturing SMEs in the Greater Accra Region of Ghana, which formed the basis of this analysis.

Summary Statistics
Table 1: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Capital structure	52	-.154	3.323	-21.58	9.78
Asset structure	52	13.672	91.38	.51	659.88
Firm size	52	6.902	1.488	.05	8.77
Profitability	52	.534	2.499	-3.5	14
Firms age	52	13.298	7.952	0	45
Interest rate	52	9.077	13.764	0	32

As indicated in Table 1, the analysis is based on a total of 52 observations, corresponding to 52 distinct firms.
The average ratio of the capital structure is -0.15 while the minimum ratio is -21.58 and the maximum is 9.78.
The average firm size is 6.90 percentage points while the minimum size is 0.05 percentage points The average asset structure ratio among the firms is 13.67, ranging from a minimum of 0.51 to a maximum of 659.88.and the maximum size is 8.77 percentage points.
The average ratio of profitability of the firms is 0.53 while the minimum ratio is -3.5 and the maximum ratio is 14.0.
The average firm age is 13 years, with the most established firm has been in operation for 45 years.
On average the firms borrow at a short-term interest rate of 9.0 percent and the highest rate of 32.0 percent.

3.11 Method of estimation
The study employs the Generalized Least Squares (GLS) method of estimation using Stata. The study first used the OLS method of estimation. However, post-OLS estimation tests reveal the presence of heteroskedasticity in the model which makes the OLS estimates (in column 3 of Table 2) inefficient and unreliable.
Given this, the GLS method was employed to resolve the heteroskedasticity problem in the model. To that effect, the analysis is based on the GLS estimates in column 2 of Table 2 below.

4. Interpretation of Results
4.1 Introduction
This involves the systematic and objective process of explaining, analyzing, and drawing meaningful conclusions from the collected data, concerning the research question, objectives, and hypotheses.

Determinants of capital structure
Table 2: Linear regression results

Variable (1)	GLS Results (2)	OLS Results (3)
Capital structure (CS)	-	-
Asset Structure (AS)	-0.002 *** (0.000)	0.010 ** (0.005)
Firm Size (FS)	0.016** (0.008)	3.074*** (0.638)
Profitability (PR)	0.079* (0.041)	1.996*** (0.380)

Firm Age (FA)	-0.009** (0.004)	-0.065 (0.049)
Interest Rate (IRs)	0.006*** (0.001)	-0.033 (0.032)
R-squared	0.990	0.403
Number of Observations	52	52
F-Test/ Prob > F	939.038 ***	6.208***
B.Pagan/C.Weisberg Test	Chi2(1) = 0.36 | P >chi2(0.548)	Chi2(1)= 57.32***|P >chi2(0.000)

*Significance Levels; *** p<.01, ** p<.05, * p<.10 | Standard errors in parenthesis*

4.1.1 Asset structure (AS)
The GLS results reveal a significant negative relationship between asset structure and capital structure, with a coefficient of -0.002 at a 1% significance level. A one-unit increase in the asset structure ratio is associated with a corresponding 0.002-unit decline in the capital structure ratio, assuming all else remains constant. Contrary to expectations and previous findings (Boyle and Eckhold, 2018), which propose a positive link between asset structure and capital structure due to increased reliance on debt financing for firms with more fixed assets, our results indicate a negative association.

4.1.2 Firm size (FS)
The GLS analysis reveals a statistically significant and positive correlation between firm size and capital structure, with a coefficient of 0.016 at a 5% significance level. This suggests that firm size has a substantial positive influence on capital structure. Specifically, a one-unit increase in firm size corresponds to a 0.016 percentage point increase in the capital structure ratio, assuming all other factors remain constant. Our results confirm the hypothesis that firm size is positively associated with capital structure, aligning with the notion that larger firms have easier access to debt financing due to lower borrowing costs. This finding is consistent with the research of Harris and Raviv (2018), who observed that larger firms tend to have higher debt levels in their capital structure.

4.1.3 Profitability (PR)
The GLS analysis reveals a statistically significant and positive link between profitability and capital structure, characterized by a coefficient of 0.079 at a 10% significance level. This implies that heightened profitability exerts a favourable influence on capital structure. Notably, a one-unit increase in profitability corresponds to a 0.079-unit rise in the capital structure ratio, assuming other factors remain constant. Our results substantiate the hypothesis that profitability positively correlates with capital structure, echoing the notion that firms with higher profitability may possess greater internal funding capabilities, thereby shaping their capital structure decisions. This outcome resonates with the research findings of Agyei-Mensah (2023).

4.1.4 Firms age (FA)
The GLS analysis yields a statistically significant negative correlation between firm age and capital structure, with a coefficient of -0.009 at a 5% significance level. This suggests that firm age exerts a substantial negative influence on capital structure, such that a one-year increase in firm age corresponds to a 0.009-unit decline in the capital structure ratio. Surprisingly, our results indicate that firm age is inversely related to capital structure, contradicting the notion that established firms enjoy easier access to debt financing due to their long-standing relationships with lenders. This result diverges from the conclusions of Umer (2020).

4.1.5 Interest rate (IR)
The GLS analysis reveals a statistically significant and positive association between interest rates and capital structure, characterized by a coefficient of 0.006 at a 1% significance level. This implies that fluctuations in interest rates exert a substantial positive influence on capital structure, such that a one-unit increase in interest rates corresponds to a 0.006-unit rise in the capital structure ratio, assuming all else remains constant. Our results substantiate the hypothesis that interest rates positively correlate with capital structure, aligning with the idea that rising interest rates shape firms' capital structure decisions. This result aligns with the findings of Amoako (2021).

4.2 Diagnostic tests
Diagnostic tests were performed to assess normality and heteroskedasticity. The tests revealed significant heteroskedasticity, with a chi-squared statistic of 57.32, significant at 1% (Table 2, column 3), indicating non-constant variance in the model. This implies the error terms are not normally distributed and the OLS estimates are biased, no longer efficient and reliable.

GLS was employed under which the model was transformed by dividing variables by the square root of the variance of the error terms (Gujarati and Porter,2009).

Linear regression (OLS)
Table 3 Linear regression
Linear regression (OLS)

Capital structure	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
Asset structure	.01	.005	2.07	.044	0	.02	**
Ln firm size	3.074	.638	4.82	0	1.789	4.358	***
Profitability	1.996	.38	5.26	0	1.232	2.761	***
Firms age	-.065	.049	-1.34	.188	-.163	.033	
Interest rates	-.033	.032	-1.02	.311	-.099	.032	
Constant	-21.407	4.464	-4.80	0	-30.393	-12.42	***

Mean dependent var	-0.154	SD dependent var	3.323	
R-squared	0.403	Number of obs	52	
F-test	6.208	Prob > F	0.000	
Akaike crit. (AIC)	256.632	Bayesian crit. (BIC)	268.339	

*** p<.01, ** p<.05, * p<.1

Breusch–Pagan/Cook–Weisberg test for heteroskedasticity
Assumption: i.i.d. error terms
Variables: All independent variables
H0: Constant variance
$F(5, 46) = 3.40$
$Prob > F = 0.0106$

4.3 Robustness checks

Post-estimation tests for the GLS results show that heteroskedasticity is no longer present in the transformed model. The test for heteroskedasticity shows that the test statistic (chi2= 0.36) is not significant (see column 2 of Table 2) which implies that the problem of heteroskedasticity is resolved. F-Test statistic (939.038) in column 2 of Table 2 also shows that the explanatory variables in the model are jointly significant at the 1% level of significance.

Approximately 99% of the variation in firms' capital structure is accounted for by the interplay of five key factors: asset structure, firm size, profitability, firm age, and interest rates, as evidenced by the R-squared value of 0.990.

Table 4 Linear regression
Linear regression (GLS)

CS	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
AS	-.002	0	-22.46	0	-.002	-.001	***
FS	.016	.008	1.94	.058	-.001	.033	*
PR	.079	.041	1.91	.062	-.004	.161	*
FA	-.009	.004	-1.98	.053	-.017	0	*
IRs	.006	.001	5.76	0	.004	.008	***
Constant	.046	.057	0.81	.42	-.068	.161	

Mean dependent var	-0.582	SD dependent var	3.822	
R-squared	0.990	Number of obs	52	
F-test	939.038	Prob > F	0.000	
Akaike crit. (AIC)	56.957	Bayesian crit. (BIC)	68.664	

*** p<.01, ** p<.05, * p<.1

Breusch–Pagan/Cook–Weisberg test for heteroskedasticity
Assumption: i.i.d. error terms
Variables: All independent variables
H0: Constant variance
$F(5, 46) = 0.21$
$Prob > F = 0.9572$
Linear regression (GLS)

5. Conclusion and Recommendations

5.1 Conclusion

This research investigated the factors influencing capital structure among manufacturing SMEs in Ghana's Greater Accra Region from 2019 to 2023. Key findings indicate that:

•Asset structure negatively impacts capital structure.

•Firm size positively influences financial composition

•There is a positive correlation between profitability and capital structure, indicating that higher profitability tends to favourably impact a firm's capital structure.

•Age negatively affects capital structure.

• Interest rates positively impact capital structure.

The study's results led to the rejection of hypotheses suggesting positive relationships between asset structure, firm age, and capital structure. Conversely, hypotheses proposing positive relationships between firm size, profitability, interest rates, and capital structure were supported.

5.2 Recommendations

5.2.1 Policy recommendations

• Encourage firms to optimize their asset structure: Policymakers should encourage firms to maintain an optimal asset structure, as the findings suggest that a higher asset structure ratio is associated with a lower capital structure ratio.

•Encourage firm expansion: To promote greater access to debt financing, policymakers should strive to create a business environment that encourages and supports firm growth and development.

•Cultivate a supportive business ecosystem: Rather than relying on firm age as a factor in debt financing, policymakers should focus on creating a business-friendly environment that enables firms to thrive.

•Regulate interest rates: Policymakers should closely monitor interest rates to ensure they promote economic growth and development.

•Prioritize profitability: Policymakers should incentivize firms to focus on profitability.

5.2.2 Regulatory recommendations

•Review and revise regulatory frameworks: Regulatory bodies should review and revise regulatory frameworks to ensure that they promote firm growth and development, and encourage firms to maintain an optimal asset structure.

• Monitor and regulate interest rates: Regulatory bodies should monitor and regulate interest rates to ensure that they are set at levels that promote economic growth and development.

5.2.3 Future Research Directions

• Investigate the impact of industry-specific factors: Future research could explore how industry-specific factors, such as regulatory requirements or industry norms, influence capital structure decisions.

•Examine the role of corporate governance: Research could investigate how corporate governance mechanisms, such as board composition or executive compensation, affect capital structure choices.

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