



Predictors of corporate financial performance: An empirical evidence from the Ghana stock exchange (GSE)

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Abstract

This study sought to examine the predictors of the financial performance of non-financial firms listed on the Ghana Stock Exchange (GSE). A ten (10) year panel data sourced from the audited and published annual reports of fifteen (15) selected firms for the period 2008 to 2017 was used for the study. In the study, financial performance proxied by Return on Assets (ROA) served as the explained variable, whilst liquidity, capital structure, operational efficiency and firm size served as the explanatory variables. From the study's *Robust Random-Effects GLS* regression estimates, liquidity, operational efficiency and firm size were not significant predictors of the firms' financial performance as measured by ROA. However, capital structure proxied by the debt ratio was a significant predictor of the firms' financial performance. It was also uncovered that, liquidity, capital structure, operational efficiency and firm size were combined significant predictors of the firms' financial performance [(Wald chi2 (4) =84338.06, (p=0.0000) <0.05]. Based on the findings, it was recommended that, non-financial firms listed on the Ghana Stock Exchange (GSE) could gain greater financial performance by efficiently using their size to gain economies of scale; by operating with a capital structure mix that minimizes costs and maximizes returns; by efficiently managing or using their assets to generate revenues (in other words, employing effective revenue diversification strategies as opposed to focused strategies); and by maintaining the right amount of liquid assets. Put simply, the financial performance of non-financial firms listed on the Ghana Stock Exchange (GSE) is largely driven by firm size, liquidity, capital structure and assets' management. The careful planning and management of the above variables, is therefore an essential way of improving the final bottom line of the firms.

Keywords: predictors, corporate financial performance, Ghana stock exchange (GSE)

Introduction

According to Erastus (2008) and Mohammed, Yusheng and Stephen (2019) ^[57], financial performance is the process of measuring the results of a firm's strategies and activities in monetary terms. It pinpoints the economic powers and flaws of an entity by establishing links between the items of the statement of financial position and that of the comprehensive income statement (Erasmus, 2008) ^[25]. Firm characteristics defined by Zou and Stan (1998) ^[98] as a firm's demographic and managerial variables which comprise partly of its internal environment, have been viewed as the major predictors of corporate financial performance. As posited by Kogan and Tian (2012) ^[41] and Mohammed, Yusheng, Stephen, Mary, Prince and Anthony (2019) ^[58], firm characteristics include firm size, leverage, liquidity, sales growth, asset growth and turnover. Subrahmanyam and Titman (2001) ^[84] and McKnight and Weir (2008) ^[47] on the other hand, identified ownership structure, board characteristics, age of firms, dividend pay-out, profitability, access to capital markets and growth opportunities as the other aspects of firms' characteristics that predict corporate financial performance. The above variables among others have of late become the core emphasis of the corporate world, research and investment. Due to this key emphasis, numerous research have been conducted to explore the various determinants of corporate financial performance in different working environments. The discoveries of these studies have however been contradictory. For instance, on liquidity, Lyndon and Paymaster (2016) ^[43] and

Sheikhdon and Kavalae (2016) ^[83] found a positive link between liquidity and firms' financial performance; whilst Abubakar, Sulaiman and Haruna (2018) ^[2] and Okaro and Nwakoby (2016) ^[69] found an inverse connection between liquidity and firms' financial performance; with Durrah, Abdul, Syed and Nour (2016) ^[23] and Raykov (2017) ^[77] disclosing an insignificant relationship between liquidity and firms' financial performance. On capital structure, Bassey, Ukpe and Solomon (2017) ^[7] and Nadeesha and Pieris (2014) ^[62] discovered a positive association between capital structure and corporate financial performance; whilst Sheikh and Wang (2013) ^[82] and Mumtaz, Rauf, Ahmad and Noreen (2013) ^[61] established an adverse relationship between capital structure and firms' financial performance; with Oladele, Omotosho and Adeniyi (2017) ^[71] and Olaniyi, Elelu and Abdulsalam (2015) ^[72] establishing an insignificant association between capital structure and firms' financial performance. On firm size, Foyeke, Ojeka and Aanu (2015) ^[27] and Odalo, Achoki and Njuguna (2016) ^[68] discovered a positive relationship between firm size and firms' financial performance, whilst An, Davey and Eggleton (2011) ^[5] and Sufian (2009) ^[85] found a negative relationship between firm size and firms' financial performance. Finally on operational efficiency, Azadi (2013) ^[6], Reyhani (2012) ^[79], Ndolo (2015) ^[64] and Ishmael and Kehinde (2013) ^[36] found a significantly positive connection between operational efficiency and firms' financial performance, whilst Dhillon and Vachhrajani (2012) ^[18] and Okwo, Okelue and Nweze (2012) ^[70] revealed an insignificantly positive relationship

Between operational efficiency and firms' financial performance. On the other hand, Jamali and Asadi (2012)^[37] discovered a high degree of association between management efficiency and firms' financial performance but did not indicate the direction of the association; Qiang, Beng and Jae (2014)^[75] using data from 3,907 unique firms for the period 2004 to 2011 concluded that, smaller firms benefited more from effective internal controls in terms of operational efficiency; and Demir (2005)^[17] while examining the relationship among higher risks, uncertainty and the competition of 172 manufacturing firms in Turkey for the period 1993 to 2003, disclosed that, increasing short-term financial investments reduced the negative effects of risk, volatility and higher interest rates at a significant level, whilst the increasing uncertainty, country risk and real interest rates had a significantly negative effect on the firms' profitability.

The aforementioned studies though very beneficial, are still limited in scope in that, they failed to consider the non-financial sector of Ghana. The studies are also limited in scope in that, none of them sought to find out if the Liquid Ratio (LR), Debt Ratio (DR), Size and Efficiency were significant predictors of corporate financial performance as measured by Return on Assets (ROA). This study was therefore undertaken to help fill the above gaps. Specifically, the study sought to; find out whether liquidity was a significant predictor of the firms' financial performance or not, establish whether capital structure significantly predicted the firms' financial performance or not, find out whether size was a significant predictor of the firms' financial performance or not, establish whether operational efficiency significantly predicted the firms' financial performance or not, and to find out whether liquidity, capital structure, size and operational efficiency were combined significant predictors of the firms' financial performance or not.

Literature Review

This part of the study reviews literature that supported the topic under study. The reviews are conducted empirically to explore the interactions between; liquidity and financial performance; capital structure and financial performance; firm size and financial performance; and operational efficiency and financial performance. This section concludes with the conceptual framework or the research model that guided the conduct of the study.

Liquidity and Financial Performance

Abubakar, Sulaiman and Haruna (2018)^[2] studied into the effect of firms' characteristics on the financial performance of listed insurance companies in Nigeria. Data from the annual reports and accounts of insurance companies quoted on the Nigeria Stock Exchange (NSE) for the period 2007 to 2016 was used for the study. Using the robust regression analysis, the study revealed that, liquidity and age had a significantly negative impact on the companies' financial performance. Mohammed and Yusheng (2019b)^[49] researched on the relationship between liquidity and the financial performance of non-financial firms listed on the Ghana Stock Exchange (GSE). From the study's findings, liquidity had a significant link with the firms' ROA, but an insignificant connection with the entities' ROE and ROCE. Syed (2015)^[83] in India, delved into the impact of liquidity and management efficiency on the profitability of 23 selected power distribution utilities for the period 2004-05 to 2013-14. Data from

the annual and PFC reports of the firms were used for the study. Adopting the Generalized Least Squares (GLS) regression technique, the study disclosed that, debtor's turnover ratio, collection efficiency and interest coverage ratio had a significant effect on the profitability of the utilities, whilst the quick ratio, absolute liquid ratio and creditor's turnover ratio had an insignificant influence on the profitability of the utilities. Mohammed and Yusheng (2019d)^[51] investigated the affiliation between cash flows and the financial performance of non-financial firms listed on the Ghana Stock Exchange (GSE). From the results, cash flows had a significantly positive association with the firms ROA.

Lartey, Antwi and Boadi (2013)^[42] conducted a study to explore the relationship between liquidity and profitability of seven (7) out of nine (9) banks listed on the Ghana Stock Exchange (GSE). Secondary data obtained through the financial reports of the banks for the period 2005 to 2010 was used for the study. Regressing the main liquidity ratios on the profitability ratios of the banks, the study revealed that, liquidity had a positively weak relationship with the banks' profitability. It was also disclosed that, profitability and liquidity of the banks showed a declining trend when time series analysis was undertaken. Yusheng, Mohammed and Stephen (2019)^[57] studied the liquidity-profitability trade-off of listed non-financial firms in Ghana. From the findings, liquidity proxied by the cash flow ratio had a significantly positive influence on the firms' ROCE, but liquidity proxied by the cash ratio had an insignificantly negative impact on the corporates' ROCE. Kamoyo (2006)^[38] carried out an empirical study on the determinants of liquidity of commercial banks in Kenya. The study involved 30 commercial banks operating in Kenya for the period 1995 to 2004. The study applied descriptive statistics, investigative questionnaires and multiple regression analysis to establish the determinants of liquidity in the banks. Results of the study indicated an insignificantly negative relationship between profitability and liquidity.

Also in Nigeria, Lyndon and Paymaster (2016)^[43] examined the impact of liquidity management on the profitability of five (5) food and beverage companies listed on the Nigeria Stock Exchange (NSE) for the period 2011 to 2015. Secondary data obtained through the annual reports and accounts of the selected companies was used for the study. Through descriptive and multiple regression analysis, the study revealed that, Cash Ratio (CARAT) and Quick Ratio (QUIRA) had significantly positive relationship with the profitability (ROCE) of the firms. From the study, Cash Conversion Cycle (CACCY) also had an insignificantly inverse relationship with the profitability (ROCE) of the firms. Kartal (2016)^[39] in Turkey studied on the effect of liquidity on financial performance (in terms of profitability) of Borsa Istanbul (BIST) listed retail merchandising firms for the period 1998-2015. Using time series data of the firms, the study revealed a significantly positive relationship between financial performance and liquidity.

Yusheng, Mohammed and Andrew (2019)^[58] conducted a correlational study on quoted non-financial firms in Ghana. From the results, liquidity had a significant relationship with the firms ROA, but insignificant affiliation with the corporates' ROE and ROCE. Agbada and Osuji (2013)^[3] delved into the effect of efficient liquidity management on banking performance in Nigeria. Findings of the study disclosed a significant association between efficient liquidity management and banking

performance. In conclusion, efficient liquidity management improved banking performance in Nigeria. Vieira (2010) ^[93] conducted a research on the relationship between liquidity and profitability of 48 major airline carrier companies in the world who operated within Europe, America and Asia between 2005 and 2008. In the short-term, the study revealed a significant positive relationship between liquidity and profitability. Also in the short-term, the study found out that, the higher the liquidity level, the higher the profitability of the companies. The study finally revealed a positive association between liquidity and profitability of the firms in the medium-to-long term. Based on the various review of literature, it was hypothesized that;

H_{0a}. Liquidity is not a significant predictor of the firms' financial performance.

Capital Structure and Financial Performance

Nadeesha and Pieris (2014) ^[62] examined the relationship between capital structure and the profitability of 82 non-financial profit-oriented firms listed on the Colombo Stock Exchange (CSE) for the period 2011/2012. Using the stepwise regression model, the study found out a significantly positive association between Debt to total Assets and Return on Capital Employed. A positive relationship between Debt to total Assets and size of the firms was also discovered. In conclusion, capital structure and firm size affected the performance of non-financial profit-oriented listed firms in Sri Lanka. A study by Mumtaz, Rauf, Ahmad and Noreen (2013) ^[61] sought to establish the relationship between capital structure and the performance of Pakistan's KSE 100 indexed firms. Using data of 83 selected firms, the study revealed that, capital structure (proxied by Debt/Equity ratio) significantly negatively affected the performance of the firms as measured by Return on Assets (ROA), Return on Equity (ROE) and Earnings per Share (EPS). However, capital structure did not have a significant effect on corporate performance as measured by Net Profit Margin (NPM).

In the Islamic Republic of Iran, Boroujeni, Noroozi, Nadem and Chadegani (2013) ^[10] investigated the impact of capital structure and ownership structure on the performance of companies listed on the Tehran Stock Exchange (TSE). Data from 123 listed companies for the period 2001-2008 was used for the study. Measuring performance through Return on Assets (ROA), the study revealed that, capital structure and ownership structure had a positive influence on the firms' performance. Mohammed and Yusheng K (2019a) ^[48] researched on the effect of liquidity and capital structure on the financial performance of firms listed on the Ghana Alternative

Market (GAX). From the study's findings capital structure had a significant connection with the entities' financial performance. Mahfuzah and Raj (2012) ^[45] researched on the association between capital structure and the performance of 237 companies listed on the Bursa Malaysia Stock Exchange for the period 1995 to 2011. In the study, Return on Equity (ROE), Return on Assets (ROA), Earnings Per Share (EPS) and Tobin's Q were used to proxy corporate performance, whilst Long term Debt, Short term Debt, Total Debt and Growth served as the measures of capital structure, with Size representing the control variable. Through the panel data procedure, the study disclosed that, corporate performance proxied by Return on Equity (ROE), Return on Assets (ROA) and Earnings per Share (EPS) was negatively

associated with Long term Debt, Short term Debt and Total Debt, whilst Growth had a positive association with performance in all the sectors. Tobin's Q also revealed a significantly positive relationship between Long term Debt and Short term Debt; and finally discovered a significantly inverse relationship between Total Debt and the firms' performance.

Mohammed and Yusheng (2019c) ^[50] study the influence of capital structure on the financial performance of firms quoted on the Ghana Alternative Market (GAX). From the discoveries, capital structure had a significantly negative relationship with the firms' financial performance.

Nwanna and Ivie (2017) ^[66] examined the effect of financial leverage on the performance of 13 deposit-money banks listed on the Nigerian Stock Exchange for the period 2006 to 2015. Data obtained from the annual reports of the banks was used for the study. Financial leverage served as the study's explanatory variable proxied by the debt ratio, debt-equity ratio and interest coverage ratio, whilst performance proxied by ROCE, size, liquidity, efficiency and market capitalization value represented the output variable of the study. Adopting the Ordinary Least Squares (OLS) multiple regression technique, the study revealed that, financial leverage had a significant effect on the profitability (ROCE) and efficiency of the banks. However, financial leverage had no significant influence on the liquidity, size and market capitalization value of the banks. Chinaemerem and Anthony (2012) ^[12] examined the impact of capital structure on the financial performance of thirty (30) non-financial firms listed on the Nigerian Stock Exchange. A seven year period spanning from 2004 to 2010 was considered for the study. Panel data for the selected firms were generated and analyzed using Ordinary Least Squares (OLS) method of estimation. It was disclosed from the study that, firms' capital structure surrogated by debt ratio had a significantly negative impact on the firms' financial measures, Return on Assets (ROA) and Return on Equity (ROE).

Taani (2003) ^[87] examined the impact of capital structure on the performance of 12 Jordanian banks listed on Amman Stock Exchange (ASE) for the period 2007-2011. Multiple regressions were applied on performance indicators such as net profit, return on capital employed, return on equity and net interest margin, whilst, total debt to total funds and total debt to total equity were used as capital structure variables. It was revealed that, the performance of the banks were significantly and positively associated with their total debt to total fund and their total debt to total equity; except return on equity which had an insignificant relationship with their total debt to total fund and their total debt to total equity in the banking industry. Oladele, Omotosho and Adeniyi (2017) ^[71] examined the effect of capital structure on the performance of listed manufacturing firms on the Nigerian Stock Exchange for the period 2004 to 2013. The study specifically sought to establish the relationship that existed between the capital structure choices of the firms and their return on assets, return on equity, sales growth and earnings per share (indicators of corporate financial performance). Secondary data obtained from the NSE fact book was used for the study. Through the multiple regression analysis, the study revealed that, capital structure had an insignificant influence on return on equity (ROE), but a significant effect on Return on Assets (ROA), Earnings per Share (EPS) and sales growth of the listed firms. Mohammed and Yusheng (2019f) ^[53] researched on leverage and the financial performance of listed non-financial firms in Ghana.

From the findings leverage had a significantly inverse link with the firms' ROA. Nwanna and Ivie (2017)^[66] examined the effect of financial leverage on the performance of 13 deposit-money banks listed on the Nigerian Stock Exchange for the period 2006 to 2015. Data obtained from the annual reports of the banks was used for the study. Financial leverage served as the study's explanatory variable proxied by the debt ratio, debt-equity ratio and interest coverage ratio, whilst performance proxied by ROCE, size, liquidity, efficiency and market capitalization value represented the output variable of the study. Adopting the Ordinary Least Squares (OLS) multiple regression technique, the study revealed that, financial leverage had a significant effect on the profitability (ROCE) and efficiency of the banks.

Enekwe, Agu and Eziedo (2014)^[24] researched into the effect of financial leverage on the financial performance of three quoted pharmaceutical companies on the Nigerian Stock Exchange. Debt Ratio (DR), Debt-Equity Ratio (DER) and Interest Coverage Ratio (ICR) were used as measures of financial leverage, whilst Return on Assets (ROA) represented financial performance. Secondary data obtained from the financial statements of the companies' for a twelve (12) year period (2001-2012) was employed for the study. Through, descriptive, Pearson's correlation and regressions analysis, the study disclosed that, debt ratio (DR) and debt-equity ratio (DER) were negatively related to ROA, while interest coverage ratio (ICR) had a positive association with ROA. The study also discovered that, debt ratio, debt-equity ratio and interest coverage ratio had no significant effect on the companies' performance. Mohammed and Yusheng (2019g)^[54] conducted a study on the nexus amid capital structure and the viability of some listed body corporates in Ghana. From the results, capital structure proxied by the DA had a significantly negative association with the firms' ROA, but capital structure proxied by the ETA had a significantly positive connection with the firms' ROA. Based on the various review of literature, it was hypothesized that;

H_{0b}. Capital structure does not significantly predict the firms' financial performance.

Firm Size and Financial Performance

In Sri Lanka, Velnampy and Nimalathan (2010)^[91] examined the relationship between firm size and profitability in the Bank of Ceylon and the Commercial Bank of Ceylon for a period of ten years spanning from 1997 to 2006. The study's findings revealed a positive relationship between firm size and profitability in the Commercial Bank of Ceylon. However, there was no relationship between firm size and profitability in the Bank of Ceylon. Hall and Weiss (1967)^[32] who reported that, size did tend to be associated with higher profit rates, however reached the opposite conclusion. The researchers observed through their studies that, there was a positive association that disappeared or reversed itself among the firms with the largest assets. The study conducted by An Yi, Davey and Eggleton (2011)^[5] on Chinese Companies' IC Disclosure revealed that, firm size had an inverse influence on the firms' financial performance.

Foyeke, Ojeka and Aanu (2015)^[27] conducted a research on firm size and the financial performance of 137 financial and non-financial firms in Nigeria. Using the weighted logistic regression method of analysis, it was disclosed that, firm size had a significantly positive relationship with the corporate governance

disclosure practices of the firms. In Pakistan, Abbasi and Malik (2015)^[11] studied into firm size and the financial performance of 50 firms listed on Karachi Stock Exchange (KSE). From the study's regression results, the alternative hypothesis that, firm size had a moderating inspiration between the regressor (firm growth) and the regressand (firm performance) could not be rejected. It was therefore imperative for management to keep an eye on firm size along with firm growth while enhancing firm performance. Also in Pakistan, the study by Muhammad (2014)^[60] on the determinants of commercial banks' profitability, discovered a direct association between capital strength, asset quality, bank size and the banks' profitability.

Mohammed and Yusheng (2019e)^[52], conducted a study on the relationship between size and the financial performance of firms listed on the Ghana Stock Exchange (GSE). From the findings, size had a significantly positive connection with the firms ROA. Inyama and Chukwuani (2014)^[35] investigated into the interactions between firm size and the financial performance of firms in the Nigerian brewery sector. From the study's findings, firm size had both short-term and long-term positive effect on EPS, with a significant long run influence. The findings also showed no causality running from either EPS to total assets or otherwise. In Kenya, Odalo, Achoki and Njuguna (2016)^[68] conducted a study on Agricultural firms listed on the Nairobi Securities Exchange (NSE). Using descriptive and inferential analysis, the study found out that, company size as measured by total assets had a significantly positive impact on all the three financial performance indicators of the firms. It was also disclosed from the study that, large companies had more competitive advantage over their smaller counterparts.

In Croatia, Pervan and Višić (2012)^[74], researched into the influence of firm size on business success, and discovered a significantly positive effect of firm size on firm profitability. Also from the study's findings, assets turnover and debt ratio statistically significantly affected the firms' performance, whilst the current ratio failed to be a significant predictor of the firms' profitability. The study by Ramlall (2009)^[76] discovered a positive association between bank size and bank profitability. According to the study's findings, larger banks are more profitable than smaller banks, demonstrating the effect of economy of scale. In contrast, Sufian (2009)^[85] was of the view that, the large size of banks may have a negative effect on their profitability. To the author, smaller banks earn higher profits because, they have lower expenses and better performance efficiency. Based on the various review of literature, it was hypothesized that;

H_{0c}. Size is not a significant predictor of the firms' financial performance

Efficiency and Financial Performance

Dhillon and Vachhrajani (2012)^[18] examined the impact of operational efficiency on the overall profitability of Gujarat Industries Power Company Limited (GIPCL) for the period June 2005 to November 2010. Using activity ratios like assets turnover as a measure of efficiency, the study disclosed an insignificantly positive association between operational efficiency and the firm's overall profitability. Dong, Charles and Cai (2012)^[19] researched into the level of fixed assets and risk-adjusted performance of corporates in China. From the study's findings, firms with a

higher level of fixed asset holding expenses and covered by preferential tax policies were found to be associated with lower risk-adjusted performance.

Mohammed, Yusheng and Isaac (2019) ^[55] explored the link between operational efficiency and firms' financial performance of listed non-financial body corporates on the Ghana Stock Exchange (GSE). From the results, operational efficiency proxied by the assets turnover ratio had a significantly negative association with the firms' financial performance as measured by ROA. Okwo, Okelue and Nweze (2012) ^[70] assessed the impact of brewery firms' fixed assets investments on their operating profit margin for the period 1999 to 2009. Through the multiple regression analysis, the study found an insignificantly positive relationship between fixed assets investments and the firms' operating profit margin in Nigeria. Reyhani (2012) ^[79] conducted a study to explore the influence of assets structure on the performance of accepted companies listed on the Tehran Stock Exchange (TSE). From the study's findings, fixed assets had a significantly positive impact on the firms' EBIT. Jamali and Asadi (2012) ^[37] also researched into the relationship between management efficiency and the profitability of 13 auto manufacturing companies listed on the Bombay Stock Exchange for the period 2006 to 2010. Using assets turnover as a proxy for management efficiency, the study found a high degree of association between management efficiency and the firms' profitability.

Ishmael and Kehinde (2013) ^[36] conducted a study on the effects of the components of current assets on the profitability of Ajaokuta Iron Industry. From the study's results, an upward trend of profitability for the period 2001 to 2010 was uncovered. Azadi (2013) ^[6] also researched on the effects of changes in assets (fixed and current) on accepted operating earnings of chemical industries listed on the Tehran Stock Exchange (TSE). Findings of the study established a positive and a significant influence of fixed assets on the operating earnings of the firms. In Kenya, Ndolo (2015) ^[64] explored the relationship between operational efficiency and the financial performance of firms listed on the Nairobi Securities Exchange (NSE). From the study's findings operational efficiency had a statistically significantly positive influence on the firms' financial performance as measured by ROA.

A study on internal control and operational efficiency was undertaken by Qiang, Beng and Jae (2014) ^[75]. Data from 3,907 unique firms for the period 2004 to 2011 was used for the study. Adopting the Data Envelopment Analysis (DEA) technique, it was discovered that, operational efficiency was lower among firms with material weaknesses in internal control relative to firms without such weaknesses. The study's findings also revealed that, effective internal controls led to greater operational efficiency as it reduced the likelihood of the misappropriation of corporate resources and also enhanced the quality of internal reports for decision making. The study concluded finally that, smaller firms benefited more from effective internal controls in terms of operational efficiency.

Demir (2005) ^[17] examined the relationship among higher risks, uncertainty and the competition of 172 manufacturing firms in Turkey for the period 1993 to 2003. Investments in financial assets or fixed assets and their impact on corporate profitability was the major aim of the study. From the study's results, increasing short-term financial investments was found to have

reduced the negative effects of risk, volatility and higher interest rates at a significant level, while the increasing uncertainty, country risk and real interest rates had a significantly negative effect on the firms' profitability. Based on the various review of literature, it was finally hypothesized that;

H_{0d}. Operational efficiency does not significantly predict the firms' financial performance.

H_{0e}. Liquidity, capital structure, size and operational efficiency are not combined significant predictors of the firms' financial performance.

Conceptual Framework

A conceptual framework represents a researcher's synthesis of literature on how to explain a phenomenon (Magher, 2018; and Regoniel, 2015) ^[44, 78]. According to the authors, a conceptual frame work maps out the actions required in the course of a study given a researcher's previous knowledge of other researchers' point of view and his or her observations on the subject of the research. In other words, a conceptual framework is a researcher's understanding of how certain variables connect to each other in a study (Magher, 2018; and Regoniel, 2015) ^[44, 78]. Thus, a conceptual framework serves as a *map* or a *rudder* that guides a researcher towards the realization of his or her goals or intents in a study (Magher, 2018; and Regoniel, 2015) ^[44, 78].

The Mosby's Medical Dictionary further viewed a conceptual framework as a group of concepts that are broadly defined and systematically organized to provide a focus, a rationale and a tool for the integration and interpretation of information; whilst the Business Dictionary viewed it as assumptions, principles and rules that holds together the ideas comprising a broad concept. As McGaghie, Bordage and Shea (2001) ^[46] put it: a conceptual framework *sets the stage* for the presentation of a particular research question that drives an investigation being reported based on the problem statement. Figure 1 shows the conceptual framework or model that guided the conduct of the study.

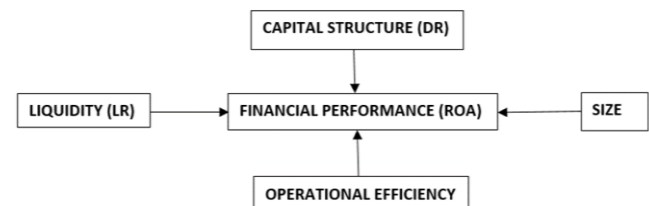


Fig 1: Conceptual Framework

Figure 1 displays the conceptual framework of the study. The framework shows that, liquidity proxied by the Liquid Ratio (LR) has a direct effect on the firms' financial performance as measured by Return on Assets (ROA). The framework also shows that, capital structure proxied by the Debt Ratio (DR) has a direct influence on the firms' financial performance. The framework finally indicates that size and operational efficiency have a direct impact on the firms' financial performance.

Research Methodology

Generally, this study was a quantitative research. The quantitative research method was chosen because, its results are based on a larger sample size that are representative of the entire population; it allowed for a greater objectivity and accuracy of results; its

results could be replicated or repeated given its high reliability and compared with similar studies; and it could be used to generalize concepts more widely, predict future results, or investigate causal relationships (Brians, Willnat, Manheim & Rich, 2011)^[9].

Specifically, the study was *panel or longitudinal* in nature because; it followed the sample over time and made repeated observations. It also described patterns of change and helped to establish the direction and magnitude of relationships (van der Krieke, Blaauw, Emerencia, Schenk, Slaets, Bos, de Jonge, & Jeronimus, 2016)^[90].

The study was further *experimental* in nature in that, it sought to establish the cause-and-effect relationship that existed between the input and the output variables by demonstrating what outcome could occur when the input variables were manipulated (Cooperstock, 2009)^[15]. In other words, the study sought to determine what effect will be on the dependent variable as a result of the direct manipulation of the independent variables. The study was finally *conclusive* because, it was well structured and systematic in design; it was carried out to test formulated hypothesis; and its findings were deemed to be significant as they could have theoretical or applied implications (Nargundkar, 2008)^[63].

All the non-financial firms listed on the Ghana Stock Exchange (GSE) totaling twenty nine (29) formed the target population of the study. The judgemental, selective or purposive sampling technique was adopted in choosing the study's sample. This technique was employed because it was flexible and met multiple needs and interests of the researcher (Saunders, Lewis & Thornhill, 2012)^[80]. The number of years in existence, technical suspension due to one reason or the other, unaudited financial records, non-existence of trend records, incomplete financial statements and the presentation of annual records in foreign currency either than that of Ghana (because of the non-stability of the Ghana Cedi to major foreign currencies) were the factors or filters that were considered during the sampling process. Firms that failed in any of these factors or filters did not form part of the study's sample. In all, fourteen (14) firms were rejected as they failed in one or more of the factors that were considered for the sampling. The sample therefore totaled fifteen (15) representing 51.72% of the population.

The study used a balanced panel data that was sourced from the audited and published annual reports of the selected firms. The annual reports covered the period 2008 to 2017 and comprised of the comprehensive income statement, statement of financial position, statement of cash flows, statement of changes in equity and notes to the accounts. The period 2008 to 2017 was considered for the study because, it was the period with the latest data and therefore very relevant to the topic understudy. In this study, validity was ensured by collecting data from the right source (GSE). Also, only annual reports audited by authorized Certified Chartered Accountants were considered for the study. To further ensure the validity and accuracy of the final results, the data collection and calculation process was triple checked by the researchers. The researchers' ensured reliability in the data by making sure that, the data collected was within the study period; the data was complete and accurate; and the data was obtained from its original source and not from a source where it might have been manipulated or altered. On ethical considerations, the

researchers ensured that, all data sources were duly acknowledged.

Model Specification and Estimation

The study used the Liquid Ratio (LR), Debt Ratio (DR), Size and Efficiency (EFF) as predictors of the firms' financial performance as measured by Return on Assets (ROA). The Generalised Least Squares (GLS) regression estimator with Random Effects (RE) was employed for the study. The choice of the estimator was made after running the *Durbin-Wu-Hausman model specification test*. According to Torres-Reynia (2007)^[88], random effects model assumes that, an entity's error term is not correlated with the predictors which allow for time-invariant variables to play a role as explanatory variables. This implies, random effects model allows for the generalization of inferences beyond the sample used in a model. Torres-Reynia (2007)^[88] put forward the random effects model as;

$$Y_{it} = \beta_1 X_{it} + \alpha + u_{it} + \varepsilon_{it} \quad (1)$$

Where;

A is the intercept.

Y_{it} is the dependent variable (DV) where i = entity and t = period of time.

X_{it} denotes one independent variable (IV).

B1 denotes the coefficient of that independent variable (IV).

u_{it} denotes the between-entity error term.

ε_{it} denotes the within-entity error term.

From the above econometric model, the following functions were deduced;

$$Y_{it} = f(\text{Financial Performance}) \quad (2)$$

$$\text{But financial performance} = f(\text{ROA}) \quad (3)$$

Therefore,

$$Y_{it} = f(\text{ROA}) \quad (4)$$

Also,

$$X_{it} = f(\text{Liquidity, Capital Structure, Size and Efficiency}) \quad (5)$$

$$\text{But liquidity} = f(\text{LR}) \quad (6)$$

$$\text{Capital structure} = f(\text{DR}) \quad (7)$$

Therefore,

$$X_{it} = f(\text{LR, DR, Size, EFF}) \quad (8)$$

$$\text{Rearranging equation} \quad (1)$$

$$Y_{it} = \alpha + \beta_1 X_{it} + u_{it} + \varepsilon_{it} \quad (9)$$

Substituting equation (4) and equation (8) into equation (9), the final working model became;

$$ROA_{it} = \alpha + \beta_1 LR_{it} + \beta_2 DR_{it} + \beta_3 Size_{it} + \beta_4 EFF_{it} + u_{it} + \varepsilon_{it} \quad (10)$$

Where

A represented the intercept.

B1 represented the parameter of the explanatory variable LR_{it}

B2 represented the partial slope coefficient of the input variable DR_{it}

B3 represented the partial slope coefficient of the influencing variable $Size_{it}$

B4 represented the parameter of the exogenous variable EFF_{it}

ROA_{it} = Return on assets of firm (i) in time (t), calculated as the net profit after tax divided by the total assets of firm (i) in time (t).

LR_{it} = Liquid ratio of firm (i) in time (t), computed as the total liquid assets divided by the total current liabilities of firm (i) in time (t).

DR_{it} = Debt ratio of firm (i) in time (t), calculated as the total liabilities divided by the total assets of firm (i) in time (t).

$Size_{it}$ = Size of firm (i) in time (t), computed as the natural log of the total assets of firm (i) in time (t) EFF_{it} = Efficiency of firm (i) in time (t), calculated as the total gross revenue divided by the total assets of firm (i) in time (t).

t = 2008-2017 (10 years).

i = 1, 2, 3, 4, 5, 6, 7.....15.

Uit denoted the between-entity error term.

Eit denoted the within-entity error term.

Priori Expectations of the Study

It was assumed that, the liquid ratio, debt ratio, size and efficiency were likely to influence the firms' financial performance as measured by ROA, meaning the partial slope coefficients were likely to be statistically significantly different from zero or simultaneously not equal to zero. Thus, $(\beta_1=\beta_2=\beta_3=\beta_4\neq 0)$ or $(\beta_1+\beta_2+\beta_3+\beta_4\neq 0)$ or $(\beta_1, \beta_2, \beta_3, \beta_4\neq 0)$.

The researcher expected a positive effect of LR on the firms' financial performance $(\beta_1>0)$ as it could mean the firms were in a good position to meet their short-term financial obligations when they fell due, thereby avoiding unnecessary costs that might affect their profitability. In other words, the LR measures short-term solvency and it represents a margin of safety for short-term payables. It evaluates the credit worthiness of a firm. Thus, an LR of 2:1 or more is considered satisfactory and capable of improving financial performance.

The effect of debt ratio on the firms' financial performance was projected to be negative $(\beta_2<0)$ because, the higher the debt position of a firm, the lower the profitability due to the costs associated with debts. Put simply, the DR shows the extent to which debt financing has been used by a firm. A higher DR introduces inflexibility in a firm's operations due to increasing interference and pressure from creditors and it means claims of creditors are greater than those of owners. On the other hand, a low DR implies a greater claim of owners than creditors (Pandey, 2010)^[73].

The influence of size on the firms' financial performance was anticipated to be positive $(\beta_3>0)$, since larger firms use better technology, are more diversified and are better managed. Also, the size of a firm determines its volume of investments in assets, and the bigger the size the higher the returns expected from a firm's investments.

The researcher finally expected a positive $(\beta_4>0)$ effect of efficiency on the firms' financial performance because better managed firms are generally expected to be more profitable, which is an indication of better utilization of resources. In summary, $(\beta_1>0, \beta_2<0, \beta_3>0, \beta_4>0)$ were the projections for the individual regressors.

Data Analysis

The descriptive and inferential techniques of data analyses were adopted by this study. Both the manipulative and criterion variables were analysed through the descriptive statistics of mean, standard deviation, variance, minimum and maximum values, range, skewness and kurtosis; whilst, the multiple regression analysis was finally employed to examine whether liquidity, capital structure, size and efficiency were significant predictors of the firms' financial performance as measured by ROA. Before the descriptive and inferential analysis of the data, diagnostic tests on the assumptions of the Classical Linear Regression Model (CLRM) were undertaken. These tests were conducted to help determine the variables that were deemed fit to be used in the study and also to determine the appropriate regression estimator for the study. All the data analysis were conducted through STATA version 15 software package with a 5% level of significance ($p\leq 0.05$).

Results of the study

This aspect of the study first presents some diagnostic tests on the assumptions of the Classical Linear Regression Model (CLRM). These tests included the tests for data normality, multi-collinearity, heteroscedasticity, autocorrelation and the Durbin-Wu-Hausman Test. Secondly, descriptive analysis on both the regressand and the regressors are presented. The descriptive analysis covers the mean; standard deviation; variance; minimum and maximum values; range; skewness and the kurtosis of the variables. Finally, multiple regression analysis on whether liquidity, capital structure, size and efficiency were significant predictors of the firms' financial performance are outlined.

Panel Data Diagnostic and Specification Tests

The data collected was subjected to diagnostic and specification tests. This is because, the consequences of model misspecification in regression analysis could be severe in terms of the adverse effects on the sampling properties of both estimators and tests (DeBenedictis & Giles, 1996)^[16]. There are also commensurate implications for forecasts and for other inferences that may be drawn from a fitted model (DeBenedictis & Giles, 1996)^[16]. Accordingly, econometrics literature places a good deal of emphasis on procedures for interrogating the quality of a model's specification. These procedures address the assumptions that might have been made about the distribution of a model's error term, and also focus on the structural specification of a model, in terms of its functional forms, the choice of regressors and possible measurement errors (DeBenedictis & Giles, 1996)^[16]. Thus, before the study's model was specified and regression analysis undertaken, the following tests were carried out on the data and adjustments made accordingly to address any violations of the Classical Linear Regression Model (CLRM) assumptions.

Test for Multi-Collinearity

As explained by Kock and Lynn (2012)^[40], multi-collinearity occurs when two or more explanatory variables are so highly correlated with each other that, it becomes difficult to come out with reliable estimates of their individual coefficients. Multi-collinearity is consequential because, it makes the standard errors of the affected coefficients to be large. In that case, the test of the

hypothesis that, the coefficients is equal zero may lead to a failure to reject a false null hypothesis of no effect of the explanator (O'Brien, 2007; and Kock & Lynn, 2012) ^[67, 40]. In short, high collinearity creates redundant information, skewing the results in a regression model (Van & Larivière, 2004; O'Brien, 2007; and Kock & Lynn, 2012) ^[89, 67, 40].

Multi-collinearity was detected through the Variance Inflation Factor (VIF) or the degree of Tolerance (1/VIF), after running the Ordinary Least Squares (OLS) regression with ROA as the response variable and Liquid Ratio (LR), Debt Ratio (DR), Size and Efficiency (EFF) as the input variables. From the results as shown in Table 1, EFF had a VIF of 1.66 at a tolerance of 0.604205, indicating that, the data values of EFF were not highly collinear with the data values of the other explanatory variables. Size also had a VIF of 1.53 at a tolerance of 0.653409, meaning, the data values of size were not seriously correlated with the data values of the other influencing variables. The VIF of 1.51 at a tolerance of 0.660336 for DR shows that, the data values of DR were not highly collinear with the data values of the other predictor variables. Finally, LR had a VIF of 1.03 at a tolerance of 0.967230, which is an indication that, the data values of LR were also not seriously correlated with the data values of the other exogenous variables.

The rule of thumb was that, a variable with a VIF greater than 5 (VIF>5) or a degree of tolerance less than 0.2 (1/VIF<0.2) was considered to be highly collinear with other explanatory variables. According to Table 1, all the variables had VIF's less

Than 5 (VIF<5) and degree of tolerance more than 0.2 (1/VIF>0.2), with the average VIF being 1.43. The results therefore show that, all the variables qualified to be used in the study.

Table 1: VIF and Tolerance Test Results

Variable	VIF	1/VIF
Efficiency	1.66	0.604205
Size	1.53	0.653409
Debt Ratio	1.51	0.660336
Liquid Ratio	1.03	0.967230
Mean VIF	1.43	

Test for Data Normality

The test for normality of the study's data was conducted through the Shapiro and Wilk (1965) ^[81] test. The test, *tested* the null hypothesis that, the data values of ROA, LR, DR, Size and EFF came from a normally distributed population at the 5% level of significance ($p < 0.05$) as against the alternative hypothesis that, the data values did not come from a normally distributed population. From the results, ROA had a W-test coefficient of 0.23731, a V-value of 88.743, a Z-value of 10.169 and a p-value of 0.00000. The test was statistically significant at the 5% level of significance [$p = 0.00000 < 0.05$]. The study therefore failed to accept the null hypothesis that, the data values of ROA came from a normally distributed population and concluded that, the data values of ROA were not normally distributed.

Table 2: Shapiro and Wilk (1965) ^[81] Test for Data Normality

Variable	Obs	W	V	Z	Prob>Z
Return on Assets	150	0.23731	88.743	10.169	0.00000
Liquid Ratio	150	0.61094	45.269	8.643	0.00000
Debt Ratio	150	0.16486	97.173	10.375	0.00000
Size	150	0.93758	7.262	4.495	0.00000
Efficiency	150	0.76662	27.155	7.485	0.00000

This also applies to the data values of LR which had a W-test coefficient of 0.61094, a V-value of 45.269, a Z-value of 8.643 and a p-value of 0.00000 indicating the test's significance at the 95% confidence interval [$p = 0.00000 < 0.05$]. Therefore, the study rejected the null hypothesis that, all the data values of LR were normally distributed and accepted the alternative hypothesis that, the data values of LR were not normally distributed. Similarly, the W-test of 0.16486 for DR, with a V-value of 97.173, a Z-value of 10.375 and a p-value of 0.00000, showed that, the test was significant at $\alpha = 5\%$ [$p = 0.00000 < 0.05$]. The study therefore rejected the null hypothesis that, the data values of DR were normally distributed and accepted the alternative hypothesis that, the data values of DR were not normally distributed.

The result for DR was synonymous to that of size which had a W-test coefficient of 0.93758, a V-value of 7.262, a Z-value of 4.495, and a p-value of 0.00000, indicating the test's significance at the 95% confidence interval [$p = 0.00000 < 0.05$]. Hence, the study failed to accept the null hypothesis that, the data values of size emanated from a normally distributed population and concluded that, the data values of size did not come from a normally distributed population.

Finally, the result for size was in tandem with that of EFF which had a W-test coefficient of 0.76662, a V-value of 27.155, a Z-value of 7.485 and a p-value of 0.00000, highlighting the significance of the test at $\alpha = 5\%$ [$p = 0.00000 < 0.05$]. The study therefore failed to accept the null hypothesis that, the data values of EFF came from a normally distributed population and concluded that, all the data values of EFF were not normally distributed. From the study's results, all the data values of ROA, LR, DR, Size and EFF were abnormally distributed at the 95% confidence interval. The researchers therefore viewed a more robust GLS regression estimator as ideal for a non-normally distributed data like that of this study.

Test for Heteroscedasticity

Heteroscedasticity describes a situation in which the error term (that is, the "noise" or random disturbance in the relationship between the input variables and the output variable), is the same across all values of the input variables (Giles, 2013; Ginker & Lieberman, 2017; and Gujarati & Porter, 2009) ^[28, 29, 31]. Heteroscedasticity was viewed as more problematic in that, it could lead to biased standard errors, and because standard errors are central to conducting significance tests and calculating

confidence intervals, it could finally lead to incorrect conclusions about the significance of the regression coefficients.

The Breusch-Pagan (1979)^[8] and Cook-Weisberg (1983)^[14] heteroscedasticity test, which *tests* the null hypothesis that, there is the absence of heteroscedasticity among the fitted values of a model (Breusch & Pagan, 1979; and Cook & Weisberg, 1983)^[8, 14] was adopted for this study. From Table 3, a *Chi2 (1)* of 10.87 with a probability of 0.0010 was statistically significant at the 95% confidence interval. The study therefore failed to accept the null hypothesis that, there was absence of heteroscedasticity among the fitted values of the ROA working model and concluded that, there was the presence of heteroscedasticity among the fitted values of the ROA working model. A more robust GLS regression estimator was therefore viewed as appropriate for estimating the study's working model.

Table 3: Heteroscedasticity Test Results

Model	chi2(1)	Prob > chi2
ROA	10.87	0.0010

Test for Serial or Autocorrelation

According to Verbeek (2012)^[92] and Colberg and Höfling (2011)^[13] serial or autocorrelation is a mathematical representation of the degree of similarity between a given time series or a cross-section and a lagged version of itself over successive time intervals. It is also referred to as lagged correlation as it measures the association between a variable's current value and its past values (Verbeek, 2012; and Colberg & Höfling, 2011)^[92, 32, 13]. Autocorrelation was considered as detrimental because its existence could make the computed standard errors, and consequently the *p*-values to be misleading making room for wrong conclusions or tests of hypothesis. The Durbin Watson Test which measures autocorrelation in residuals from regression analysis with the assumptions that, the errors are normally distributed with a mean of 0 and that, the errors are stationary (Durbin & Watson, 1950; Durbin & Watson, 1951; and Field, 2009)^[20, 21, 26] was adopted for this study.

Table 4: Serial Correlation Test Results

Model	Durbin-Watson d-statistic
ROA	0.715607

The test reports a test statistic with a value from 0 to 4 where; 2 is no autocorrelation, 0 to < 2 is positive autocorrelation and > 2 to 4 is negative autocorrelation (Durbin & Watson, 1950; Durbin & Watson, 1951; and Field, 2009)^[20, 21, 26]. The Durbin Watson test, *tests* the null hypothesis that, the errors are serially uncorrelated as against the alternative hypothesis that, the errors are serially correlated (Durbin & Watson, 1950; Durbin & Watson, 1951; and Field, 2009)^[20, 21, 26]. As indicated in Table 4, the Durbin-Watson *d*-statistic results was 0.715607. Based on this, the study failed to accept the null hypothesis that, the errors were serially uncorrelated and concluded that, there existed first order positive autocorrelation in the residuals. A more robust GLS regression estimator was again viewed as appropriate for estimating the study's working model.

Model Specification Test

The Durbin (1954)^[22], Wu (1973) and Hausman (1978)^[33] model specification test was adopted for this study. Essentially, the Durbin-Wu-Hausman test also known as Hausman's specification test or *m*-statistic, looks to see if there is a correlation between the unique errors and the regressors in a model (Greene, 2012; Durbin, 1954; Wu, 1973; and Hausman, 1978)^[30, 22, 33]. It is also used to test hypothesis in terms of the bias or inconsistency of an estimator (Greene, 2012; Durbin, 1954; Wu, 1973; and Hausman, 1978)^[30, 22, 33]. The Durbin-Wu-Hausman test, *tests* the null hypothesis that, the preferred model is random effects, whilst under the alternative hypothesis, the preferred model is fixed effects (Greene, 2012; Durbin, 1954; Wu, 1973; and Hausman, 1978)^[30, 22, 33]. In order to choose between the fixed effects model and the random effects model, the residuals of the fixed and random-effects GLS regressions for the fitted values of ROA were used to conduct the Durbin-Wu-Hausman fixed-random specification test.

Table 5: Model Specification Test Results

Model	Chi2(4)	Prob>chi2
ROA	1.30	0.8620

Results of the specification test showed a Chi2 (4) of 1.30 which was statistically insignificant at $\alpha=5\%$ [($p=0.8620$)>0.05]. The study therefore failed to reject the null hypothesis that, the random effects model was preferred over the fixed effects model and concluded that, the random-effects GLS regression estimator was the most appropriate estimator for all the fitted values of the ROA model, subject to the outcome of the random effects test.

Table 6: Breusch and Pagan LM Test Results

Model	chibar2(01)	Prob > chibar2
ROA	7.10	0.0038

As portrayed in Table 6, the Breusch and Pagan Lagrangian Multiplier test for random effects showed a *chibar2(01)* of 7.10, which was statistically significant at the 95% confidence interval [($p= 0.0038$)<0.05]. This indicates that, the random-effects GLS regression estimator was more appropriate for estimating the ROA working model. The final regression analysis was conducted through the *robust random-effects GLS* regression estimator due to the issues of heteroscedasticity and autocorrelation that were detected through the study's diagnostic tests. The choice of the estimator was consistent with Huber (1967)^[34] and White (1980)^[94].

Descriptive Analysis

All the input and output variables of the study were analysed through the descriptive statistics of mean, standard deviation, variance, minimum and maximum values, range, skewness and kurtosis. The performance proxy ROA sought to assess how efficiently the assets of the firms were being used to generate profits. It also sought to provide investors the opportunity to examine the relationship between resources and income of the firms. The ROA finally sought to serve as a bench mark for

assessing how effectively the assets of the firms were been put to use. From Table 7, the mean ROA figure of 0.0052693 implies, the firms were making 0.0052693 pesewas of profit on each cedi of investments made from the year 2008 to 2017. This is an indication that, the assets or investments of the firms were been used efficiently by management to generate profits. ROA had a minimum value of -5.6487 and a maximum value of 0.7656 resulting in a range of 6.4143. ROA of the sampled firms had a standard deviation of 0.4849762 and a variance of 0.2352019. This shows that, the data values of ROA were not too much departed from the mean. The skewness value of -10.64317 is an indication that, the data values of ROA were highly negatively skewed. The kurtosis coefficient of 124.8778 [excess (K) =124.8778-3.0=121.8778] means, the ROA distribution was abnormally distributed as it was of higher and peakier shape. The Liquid Ratio (LR) of the firms sought to measure the firms' ability to meet their short-term financial obligations with their most liquid or near cash assets (cash and cash equivalents, short-term investments or marketable securities and current accounts receivables). The sampled firms' had a mean LR of 0.8497347, a minimum value of 0.0329 and a maximum value of 6.1178, leading to a range of 6.0849. The average LR value of 0.8497347 means, the firms were not fully equipped with sufficient assets that could be instantly liquidated to pay off their current liabilities. In other words, the firms were not in a position to be able to pay off their current liabilities in the short-term. The firms also had a standard deviation of 0.9351417 and a variance of 0.87449 for their liquid ratio. This is an indication that, the data values of LR were somehow widely dispersed from the mean. Liquid ratio of the sampled firms also had a skewness coefficient of 3.304711, indicating that, the LR distribution was positively skewed. With a kurtosis value of 15.39389 [excess (K) = 15.39389-3.0=12.39389], it can be concluded from the study that, the LR distribution was not normally distributed as it was higher and peakier than the normal curve.

Table 7: Descriptive Statistics on ROA, LR, DR, SIZE and EFF

Variables	ROA	LR	DR	SIZE	EFF
Mean	0.0052693	0.8497347	0.7674467	4.600553	1.647483
Std. Dev.	0.4849762	0.9351417	1.717878	0.8196015	1.430299
Variance	0.2352019	0.87449	2.951105	0.6717466	2.045754
Minimum	-5.6487	0.0329	0.04930	2.5093	0.1908
Maximum	0.7656	6.1178	21.1263	5.9545	7.9236
Range	6.4143	6.0849	21.0770	3.4452	7.7328
Skewness	-10.64317	3.304711	11.24853	-0.4200851	1.616951
Kurtosis	124.8778	15.39389	133.372	1.995274	5.100983
Obs (N)	150	150	150	150	150

The Debt Ratio (DR) of the firms sought to measure the percentage of the firms' assets that are provided via debt. Non-financial firms listed on the Ghana Stock Exchange (GSE) had an average DR of 0.7674467, a minimum value of 0.04930 and a maximum value of 21.1263, leading to a range value of 21.0770. The mean DR value of 0.7674467 shows that, most of the assets of the firms were financed through debt but not equity. The ratio is also an indication that, the firms were highly leveraged with greater risks associated with their operations. In other words, the firms had a low borrowing capacity which lowered their financial flexibility. The firms also had a standard deviation of 1.717878 and a variance of 2.951105 for their DR. This means, the data

values of DR were widely deviated from the average. Finally, the DR distribution was highly positively skewed with a coefficient of 11.24853 and abnormally distributed with a kurtosis value of 133.372 [excess (K) = 133.372-3.0=130.372].

As depicted in Table 7, the mean size of non-financial firms listed on the GSE was 4.600553 with a standard deviation of 0.8196015 and a variance of 0.6717466. This is an indication that, the size distribution was not too widely departed from the average. The firms' size also had a minimum value of 2.5093 and a maximum value of 5.9545 resulting in a range of 3.4452. The size distribution was negatively skewed with a coefficient of -0.4200851 and abnormally distributed with a kurtosis coefficient of 1.995274 [excess (K) = 1.995274-3= -1.004726]. Finally, the firms had a mean value of 1.647483, a standard deviation of 1.430299 and a variance of 2.045754 for their Efficiency (EFF). This is an indication that, the EFF distribution was a bit widely departed from the average. Efficiency also had a minimum value of 0.1908 and a maximum value of 7.9236, leading to a range of 7.7328. The distribution for efficiency was positively skewed with a coefficient of 1.616951 and abnormally distributed with a kurtosis value of 5.100983 [excess (K) =5.100983 -3=2.100983], meaning the EFF distribution was of higher and peakier shape.

Regression Analysis

The Necessary Condition Analysis (2018) explained regression analysis as a set of statistical processes for estimating the relationships among variables. It includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between a dependent variable and one or more independent variables (NCA, 2018). In order to assess the cause and effect relationships that existed between the explained and the explanatory variables, ROA was regressed on Liquid Ratio (LR), Debt Ratio (DR), Size and Efficiency (EFF), and from Table 8, liquid ratio had a statistically insignificantly positive effect on ROA at the 5% level of significance [$\beta=0.0124567$, ($p=0.215$)>0.05]. The beta (β) value of 0.0124567 for liquid ratio implies, on the average, when all other variables were held constant, a unit change in LR led to an insignificantly 0.0124567 change in ROA.

Table 8: Regression Estimates of ROA (Robust Random-Effects)

Variable	Coefficient	Robust Std. Err.	Z-Statistic	Probability (Z)
Liquid Ratio	0.0124567	0.0100549	1.24	0.215
Debt Ratio	-0.2778104	0.0040009	-69.44	0.000
Size	0.0001464	0.0185038	0.01	0.994
Efficiency	0.0196254	0.0113241	1.73	0.083
Cons	0.1748828	0.0901714	1.94	0.052
R-Squared (R^2):				
Within	0.9338	Wald chi2 (4)	84338.06	
Between	0.9182	Prob > chi2	0.0000	
Overall	0.9311	N	150	

Note: Significance is at 5% ($p<0.05$) and regressions are based on robust estimates as proposed by Huber (1967)^[34] and White (1980)^[94] due to the issues of heteroscedasticity and autocorrelation detected through the study's diagnostic tests.

It was also discovered from the study that, deb ratio had a statistically significantly inverse influence on ROA at the 95% confidence interval [$\beta = -0.2778104$, ($p=0.000$) <0.05]. The coefficient of DR ($\beta= -0.2778104$) is an indication that, when all

other factors were held fixed, a unit increase in DR, significantly decreased ROA by 0.2778104 on the average. Further, size had a beta (β) value of 0.0001464 and a p-value of 0.994, indicating its trivially positive impact on ROA. The coefficient for size means, on the average, when all other variables were held constant, a unit change in size led to an insignificantly 0.0001464 change in ROA. Efficiency finally had a statistically insignificantly positive effect on ROA at $\alpha=5\%$ [$\beta=0.0196254$, ($p=0.083$) >0.05]. The figure 0.0196254 being the beta (β) value of efficiency implies, when all other factors were held fixed, a unit increase in efficiency led to an insignificantly 0.0196254 increase in ROA on the average. Regression results for the fitted values of ROA in Table 8 also reveals that, the explanatory variables accounted for 93.11% of the variations in ROA during the study period (overall R-squared =0.9311), whilst 6.89%(1-0.9311=0.0689) of the variations was accounted for by other inherent variabilities.

The overall R^2 result is also an indication that, the ROA model significantly fitted the data by 93.11% at the alpha level of 5%. This is explained by the Wald chi2 (4) value of 84338.06, which was statistically significant at the 95% confidence interval [($p=0.0000$) <0.05]. Significance of the Wald chi2 (4) value is therefore an indication that, the explanatory power of the input variables in respect of ROA was also statistically significant. In other words, the liquid ratio, debt ratio, size and efficiency had a combined significant impact on the firms' ROA at $\alpha=5\%$. Fitting the coefficients into the ROA working model, the final model became;

$$\text{ROA} = 0.1748828 + 0.0124567\text{LR} - 0.2778104\text{DR} + 0.0001464\text{SIZE} + 0.0196254\text{EFF} \quad (11)$$

Discussions and Tests of Hypothesis

In this part of the paper, discussions on the major findings of the study are outlined. The discussions are conducted in relation to the review of relevant literature that supported the topic understudy and are presented in the order of; the effect of liquidity on the financial performance of the firms; the impact of capital structure on the financial performance of the firms; the influence of size on the financial performance of the firms; effect of efficiency on the financial performance of the firms; and the impact of liquidity, capital structure, size and efficiency on the financial performance of the firms. Each sub-section concludes with the test of a hypothesis that was formulated for the study.

Effect of Liquidity on Financial Performance

From the results, liquid ratio of the sampled firms had a statistically insignificantly positive effect on the firms' ROA. This is explained by the beta (β) value of 0.0124567 and a p-value of 0.215. The finding though insignificant, supported the prior expectation of the study that ($\beta_1 > 0$). This finding also supported that of Syed (2015)^[83] who delved into the impact of liquidity and management efficiency on the profitability of 23 selected power distribution utilities in India for the period 2004-05 to 2013-14, and discovered that, the liquid or quick ratio had an insignificant influence on the profitability of the utilities. The finding was also in tandem with that of Lartey, Antwi and Boadi (2013)^[42] who conducted a study to explore the relationship between liquidity and the profitability of seven (7) banks listed on the Ghana Stock Exchange (GSE) for the period 2005 to 2010,

and disclosed a positively weak relationship between liquidity and the banks' profitability.

The finding further supported that of Kamoyo (2006)^[38] and Mohammed, Yusheng and Agyemang (2019)^[56] whose research on the determinants of the liquidity of 30 commercial banks operating in Kenya for the period 1995 to 2004, found an insignificantly negative relationship between profitability and the banks' liquidity. The finding did not however support that of Abubakar, Sulaiman and Haruna (2018)^[2] whose study on the effect of firms' characteristics on the financial performance of listed insurance companies in Nigeria for the period 2007 to 2016, found a significantly negative impact of liquidity and age on the firms' financial performance.

The finding was also in contradiction with that of Lyndon and Paymaster (2016)^[43] who examined the impact of liquidity management on the profitability of five (5) food and beverage companies listed on the Nigeria Stock Exchange (NSE) for the period 2011 to 2015, and discovered a significantly positive association between liquid (quick) ratio and the firms' profitability. The finding was further not in line with that of Kartal (2016)^[39] who's study on the effect of liquidity on the financial performance of Borsa Istanbul (BIST) listed retail merchandising firms for the period 1998-2015, revealed a significantly positive relationship between financial performance and the firms' liquidity. The finding finally disagreed with that of Agbada and Osuji (2013)^[3] who investigated into the effect of efficient liquidity management on banking performance, and found out that, efficient liquidity management improved banking performance in Nigeria.

Test of Hypothesis: As disclosed from the study, liquidity proxied by the liquid ratio had an insignificantly positive effect on the firms' financial performance at $\alpha=5\%$ [$\beta=0.0124567$, ($p=0.215$) >0.05]. The study therefore failed to reject the null hypothesis (H_{0a}) that liquidity as measured by the liquid ratio was not a significant predictor of the firms' financial performance.

Effect of Capital Structure on Financial Performance

From the study's findings, deb ratio had a statistically significantly inverse influence on the firms' ROA at the 95% confidence interval [$\beta = -0.2778104$, ($p=0.000$) <0.05]. This result was in support of the prior expectation of the study that ($\beta_2 < 0$). The finding was also consistent with that of Chinaemerem and Anthony (2012)^[12] who examined the impact of capital structure on the financial performance of thirty (30) non-financial firms listed on the Nigerian Stock Exchange for the period 2004 to 2010, and disclosed a significantly negative impact of capital structure on the firms' financial performance as measured by ROA and ROE. The finding further agreed with that of Mumtaz, Rauf, Ahmad and Noreen (2013)^[61] whose study on the relationship between capital structure and the performance of 83 selected firms indexed in Pakistan's KSE 100, found a significantly negative influence of capital structure on the firms' financial performance.

The finding was however not in support of Nadeesha and Pieris (2014)^[62] who examined the relationship between capital structure and the profitability of 82 non-financial profit-oriented firms listed on the Colombo Stock Exchange (CSE) for the period 2011/2012 and disclosed a significantly positive association between Debt to total Assets and the firms' profitability. The

finding was also not in agreement with that of Boroujeni, Noroozi, Nadem and Chadegani (2013)^[10] who investigated into the impact of capital structure and ownership structure on the performance of 123 companies listed on the Tehran Stock Exchange (TSE) for the period 2001 to 2008, and found out that, capital structure and ownership structure had a positive influence on the firms' performance. The finding finally supported that of Taani (2003)^[87] who examined the impact of capital structure on the performance of 12 Jordanian banks listed on the Amman Stock Exchange (ASE) for the period 2007 to 2011, and discovered a significantly positive association between the performance of the banks and their total debt to total fund and their total debt to total equity.

Test of Hypothesis: As revealed by the study, capital structure proxied by the debt ratio had a significantly negative impact on the firms' financial performance at the 5% level of significance [$\beta = -0.2778104$, ($p=0.000$) <0.05]. The study therefore failed to accept the null hypothesis (H_{0b}) that capital structure was not a significant predictor of the firms' financial performance, and conclude that capital structure as measured by the debt ratio was a significant predictor of the firms' financial performance.

Effect of Size on Financial Performance

According to the study's findings, size had an insignificantly positive influence on the firms' financial performance at the 5% level of significance [$\beta=0.0001464$, ($p=0.994$) >0.05]. The finding though insignificant, was in line with the prior expectation of the study that ($\beta_3 > 0$). The finding was also consistent with that of Velnampy and Nimalathasan (2010)^[91] who examined the relationship between firm size and profitability in the Bank of Ceylon and the Commercial Bank of Ceylon for the period 1997 to 2006, and revealed a positive relationship between firm size and the profitability of the Commercial Bank of Ceylon in Sri Lanka. The finding was also in support of Inyama and Chukwuani (2014)^[35] who conducted a study on the Nigerian Brewery Sector and found out that, firm size had both short-term and long-term positive effects on the firms' financial performance.

The finding was also in tandem with that of Foyeke, Ojeka and Aanu (2015)^[27] whose study on 137 financial and non-financial firms in Nigeria discovered a significantly positive relationship between firm size and corporate governance voluntary disclosure in the firms. The finding was however not consistent with that of An, Davey and Eggleton (2011)^[5] whose study on Chinese Companies' IC Disclosure, discovered a negative impact of firm size on the firms' financial performance. The finding also contrasted with that of Velnampy and Nimalathasan (2010)^[91] whose study in Sri Lanka found no relationship between firm size and the profitability of the Bank of Ceylon. The finding was finally not in line with that of Sufian (2009)^[85] who stated that, the large size of banks may have a negative impact on their profitability. According to the author, small banks can earn higher profit because they have lower expenses and better performance efficiency.

Test of Hypothesis: Size in the study had an insignificantly positive influence on the firms' financial performance at the 95% confidence interval [$\beta=0.0001464$, ($p=0.994$) >0.05]. The study

therefore failed to reject the null hypothesis (H_{0c}) that size was not a significant predictor of the firms' financial performance.

Effect of Efficiency on Financial Performance

From the results, the sampled firms' efficiency had a statistically insignificantly positive effect on ROA at $\alpha=5\%$ [$\beta=0.0196254$, ($p=0.083$) >0.05]. This finding was in line with the prior expectation of the study that ($\beta_4 > 0$) even though it was insignificant. The finding also supported that of Dhillon and Vachhrajani (2012)^[18] who examined the impact of operational efficiency on the overall profitability of Gujarat Industries Power Company Limited (GIPCL) and discovered an insignificantly positive association between operational efficiency and the firm's overall profitability. The finding was however not in line with that of Pervan and Višić (2012)^[74] who conducted a study in Croatia and disclosed that, assets turnover statistically significantly influenced firms' financial performance.

The finding did not also lend support to that of Jamali and Asadi (2012)^[37] who examined the relationship between management efficiency and the profitability of 13 auto manufacturing companies listed on the Bombay Stock Exchange for the period 2006 to 2010 and found a high degree of association between profitability and management efficiency. The finding did not also agree with that of Azadi (2013)^[6] whose study on the effects of changes in assets (fixed and current) on accepted operating earnings of chemical industries listed on the Tehran Stock Exchange revealed a significantly positive influence of fixed assets on the operating earnings of the firms. The finding was finally in contradiction with that of Ishmael and Kehinde (2013)^[36] whose study on the effects of the components of current assets on the profitability of Ajaokuta Iron Industry, found an upward trend of profitability for the period 2001 to 2010.

Test of Hypothesis: From the study, efficiency had a statistically insignificantly positive effect on ROA at the 5% level of significance [$\beta=0.0196254$, ($p=0.083$) >0.05]. The study therefore failed to reject the null hypothesis (H_{0d}) that operational efficiency was not a significant predictor of the firms' financial performance.

Effect of Liquidity, Capital Structure, Size and Efficiency on Financial Performance

The coefficient of multiple determination (overall R-squared=0.9311) shows that 93.11% of the variations in ROA was explained by the input variables liquid ratio, debt ratio, size and efficiency, whilst 6.89% ($1-0.9311=0.0689$) of the variations in the model was accounted for by other inherent variabilities. Significance of the variations that were being accounted for by the predictor variables is substantiated by the Wald chi2 (4) value of 84338.06 which was largely significant at $\alpha=5\%$ [$p=0.0000$] <0.05]. This implies, the explanatory variables significantly accounted for the variations in ROA. In other words, the liquid ratio, debt ratio, size and efficiency had a combined significant effect on ROA at the 95% confidence interval ($p<0.05$). This is also an indication that, the partial slope coefficients ($\beta_1=0.0124567$), ($\beta_2=-0.2778104$), ($\beta_3=0.0001464$) and ($\beta_4=0.0196254$) were respectively simultaneously not equal to zero and supported the priorexpectation of the study that, ($\beta_1=\beta_2=\beta_3=\beta_4\neq 0$) or ($\beta_1+\beta_2+\beta_3+\beta_4\neq 0$) or ($\beta_1, \beta_2, \beta_3, \beta_4\neq 0$).

The finding also agreed with that of Muhammad (2014)^[60] whose study on the determinants of commercial banks' profitability in Pakistan, discovered that, capital strength, asset quality and bank size were directly related to the banks' profitability. The finding was also in support of Oladele, Omotosho and Adeniyi (2017)^[71] whose research on the effect of capital structure on the performance of listed manufacturing firms on the Nigerian Stock Exchange for the period 2004 to 2013, disclosed that, capital structure had a significant influence on the firms' Return on Assets (ROA). The result was also consistent with that of Vieira (2010)^[93] whose research on the relationship between liquidity and profitability of 48 major airline carrier companies operating within Europe, America and Asia between 2005 and 2008, revealed a significantly positive association between liquidity and the companies' profitability. The result further agreed with that of Ndolo (2015)^[64] whose study on the relationship between operational efficiency and the financial performance of firms listed on the Nairobi Securities Exchange (NSE), found a statistically significant relationship between operational efficiency and the firms' financial performance as measured by ROA.

The finding was also in tandem with Odalo, Achoki and Njuguna (2016)^[68] whose study on Agricultural firms listed on the Nairobi Securities Exchange (NSE), found out that, company size as measured by total assets, had a statistically significantly positive

impact on the firms' financial performance. The finding was also consistent with that of Ramlall (2009)^[76] who discovered a positive relationship between bank size and bank profitability, and concluded that, larger banks were more profitable than smaller banks, thus demonstrating the effect of economy of scale. The result was however in contrast with that of Amit, Debashish and Debdas (2005)^[4], whose study on the Indian Pharmaceutical Industry concluded with no definite association between liquidity and profitability. The finding was finally in disagreement with that of Enekwe, Agu and Eziedo (2014)^[24] whose regression results on the effect of financial leverage on the financial performance of three quoted pharmaceutical companies listed on the Nigerian Stock Exchange for the period 2001 to 2012, discovered that, financial leverage proxied by the debt ratio had no significant effect on the companies' financial performance.

Test of Hypothesis: From the study, the Wald chi2 (4) value of 84338.06 was largely significant at the 95% confidence interval [(p=0.0000) <0.05]. The study therefore failed to accept the null hypothesis (H0e) that liquidity, capital structure, size and efficiency were not joint significant predictors of the firms' financial performance, and conclude that liquidity, capital structure, size and efficiency were combined significant predictors of the firms' financial performance.

Table 9: Summary of the Tests of Hypothesis

Hypothesis	Analytical Tool	Result
<i>H_{0a}</i> : Liquidity is not a significant predictor of the firms' financial performance	Regression	Accepted
<i>H_{0b}</i> : Capital structure does not significantly predict the firms' financial performance	Regression	Rejected
<i>H_{0c}</i> : Size is not a significant predictor of the firms' financial performance	Regression	Accepted
<i>H_{0d}</i> : Operational efficiency does not significantly predict the firms' financial performance	Regression	Accepted
<i>H_{0e}</i> : Liquidity, capital structure, size and efficiency are not combined significant predictors of the firms' financial performance	Regression	Rejected

Conclusion and Recommendations

This study examined the predictors of the financial performance of non-financial firms listed on the Ghana Stock Exchange (GSE). A ten (10) year panel data from fifteen (15) selected firms was used for the study. In the study, financial performance was measured through Return on Assets (ROA), whilst liquidity, capital structure, operational efficiency and firm size served as the study's explanatory variables. From the study's *Robust Random-Effects GLS* regression estimates, liquidity, operational efficiency and firm size were not significant predictors of the firms' financial performance as measured by ROA. However, capital structure proxied by the debt ratio was a significant predictor of the firms' financial performance. It was also disclosed from the study that, liquidity, capital structure, operational efficiency and firm size were combined significant predictors of the firms' financial performance.

Based on the study's findings, it was recommended that, non-financial firms listed on the Ghana Stock Exchange (GSE) could gain greater financial performance by efficiently using their size to gain economies of scale; by operating with a capital structure mix that minimizes costs and maximizes returns; by efficiently managing or using their assets to generate revenues (in other words, employing effective revenue diversification strategies as opposed to focused strategies); and by maintaining the right

amount of liquid assets. Put simply, the financial performance of non-financial firms listed on the Ghana Stock Exchange (GSE) is largely driven by firm size, liquidity, capital structure and assets' management. The careful planning and management of these variables, is therefore an essential way of improving the operational efficiency and the final bottom line of the firms. Generally, findings of this study will broaden peoples understanding of the non-financial sector of Ghana in the aspect of the variables that predict or determine firms' financial performance in that sector. This will provide valuable information to investors, experts and supervisory or regulatory authorities.

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