

The Impact of Working Capital Management on Profitability of Global Haulage Company, Ghana

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Authors' contributions

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ABSTRACT

The study examines the impact of working capital management on profitability of Global Haulage Company Limited in Ghana. The service sector, which Global Haulage Company Limited forms part accounts for about 51% of national output and this show how vital the service sector has become in terms of job creation and gross domestic product growth in the Ghanaian economy. This study therefore employed the autoregressive distributed lag (ARDL) technique to examine the relationship between working capital management and profitability of firms in Ghana using Global Haulage Company Ltd as a case study with a period range of 1995 to 2013. The regression results showed that debt ratio, firm size and current assets to total assets ratio are negatively related to firm profitability whilst current liabilities to total assets ratio is positively related to firm profitability. The study therefore recommends that, management should use less of debt in financing their activities to be able to increase profit since high debt ratio adversely impact on profitability. Also, aggressive working capital policies should be pursued if management's goal is to increase profit. In addition, policy makers should check and work on the managerial inefficiencies which are making the firm experience diseconomies of scale.

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1. INTRODUCTION

Traditionally, there are four financing decisions which every financial manager makes in the day-to-day running of the firm. They include investment decisions (long-term asset mix); financing decisions (capital-mix); dividend decisions (profit allocation) and the liquidity decisions (short-term asset-mix). The economy of Ghana until 2006 was dominated by agriculture, but is now led by service accounting for about 51% of national output [1]. This shows how very vital the service sector has become in terms of job creation and gross domestic product growth in the Ghanaian economy. With the enormous benefits that the economy gain from the service sector, except few which are based on the financial sector, specific studies on working capital management and profitability focusing on service companies in Ghana are largely unavailable. Generally, although several studies have examined the nature of the relationship between working capital management and profitability of firms [2,3,4,5,6], there is no consensus on the nature of this relationship. Some literature suggests that cash conversion cycle (a proxy for working capital management) is positively related to firm profitability [7,8] Gill et al. [6], implying that longer cash conversion cycles increase the firm's profitability. On the other hand, other studies however, suggests that shorter cash conversion cycles increase the firm's profitability [2,9,10], Thus a study such as this, contributes significantly and adds value to the existing literature on working capital management and firm profitability nexus.

Working capital starvation is generally credited as a major cause if not the major cause of small and medium scale business failure in many developed and developing countries [11]. The success of a firm depends ultimately, on its ability to generate cash receipts in excess of disbursements. The cash flow problems of many small businesses are exacerbated by poor financial management and in particular the lack of planning cash requirements [12]. It has therefore become imperative that managers understand how working capital management relate to the profitability of their business. Most especially, the economy of Ghana recently has been going through macroeconomic challenges where GDP growth rate is falling, high interest

rate making it impossible for companies to borrow and expand its operations. An economy with deteriorating currency which makes it difficult for companies to do foreign trade. Inflation and unemployment cannot be left out because of its effects on companies with this everlasting "dumsor" (load shedding). In the light of the above, it is very crucial that critical attention is given to the performance of working capital management on profitability of firms in Ghana. Based on this background, this paper aims to examine the relationship between working capital management and profitability of firms in Ghana using Global Haulage Company Ltd as a case study.

Global Haulage Company Limited is one of the most successful private transport entities in Ghana. The success of this Company has been accomplished by virtue of the principles and beliefs fused into it. The Company operates throughout the length and breadth of Ghana and to other destinations in the West African Sub – Region. It evacuates 17% of the total national output of about 650,000 tonnes of cocoa from producing areas in the hinterland to in- land Take – Over Points and the two sea ports of Tema and Takoradi. It also transports commodities like lime from Takoradi to mining companies in West Africa and also steel products, fertilizer, chemicals, consumables etc. from the two sea ports to destinations within the country and the Sub – region.

2. LITERATURE REVIEW

Adu [13] claims that the concept of working capital was first advanced by Carl Marx (1867) even though Marx did not explicitly mention working capital in his work. She claims that, workers gave credit to the firm by accepting periodical payment of wages which funded a portion of work-in-process. Thus, the concept of working capital as it is understood today, is embedded in Marx's 'variable capital' which was used to mean expenditure for payrolls advanced to workers before they complete the goods they are working on.

Working capital refers to short-term resources available to a company for financing its day-to-day activities [14]. Yeboah and Yeboah [15] defined working capital as the investment required for running daily business activities. In

the same vein, [16] said working capital meets the short-term financial requirements of a business enterprise and thus referred to working capital as a trading capital, not retained in the business in a particular form for longer than a year. They further claimed that the money invested changes form and substance during the normal course of business operations.

Performance of firms is judged based on whether its profitability is high or low. Profitability can be measured on gross profit margin, operating profit margin, net profit margin, return on asset and/or return on equity [17]. The term profitability as defined by [18] is the ability of the business organization to maintain its profit year after year. [19] also defined profitability as the ability of the firm to generate more revenue than cost, in relation to the firm's capital base. Profitability is therefore importance because it is the main purpose of business [18].

Rao and Lakew [20] asserted that ratios instead of the real value of profits are used in measuring firm profitability. This implies that ratios are not influenced by variations in the general price level and are the most frequently used in measuring bank profitability in the banking literature. The return on asset (ROA) and the return on equity (ROE) are ratios extensively used to measure profitability of firms [20].

The return on equity (ROE), computed as the net profit after tax divided by total equities measures the income earned on each unit of shareholders' capital. This measure has a shortfall of generating higher ratio for banks with high financial leverage which is normally associated with higher risk. This is true because with any level of profit after tax, as banks become highly leveraged or equity falls, the ROE is bound to increase due to the lower denominator (equity).

Return on Assets (ROA) which is computed as the firms' after tax profit over total assets [21] indicates how effectively a firm manages its assets to generate income [22]. ROA according to [21] may be biased due to off-balance-sheet activities where ROA is overstated in the evaluation of firm profitability, but believe such activities are negligible. Nonetheless, it has always been a very good and preferred measure of profitability.

Although profitability does not necessarily mean liquidity, profitability ensures firm survival, growth

and debatably, firm's liquidity levels [23]. Profitability is influenced by either internal factors or external factors. The internal factors refers to those factors that the firm can control some of which include capital structure, size, growth, age, management efficiency, reputation among others whilst the external factors are those beyond the control of the firm such as economic conditions (interest rate, Exchange rate risk, inflation, etc).

The choice of working capital policy affects the profitability of firms. The conservative working capital policy as described by [24,25,23] implies a higher investment in working capital accounts. For instance, higher levels of inventories, larger quantity of current assets in relation to total assets extending more trade credit to customers and reducing supplier's financing result in a lower profitability and lower risk. However, empirical studies show that conservative working capital policy positively affect profitability due to higher levels of inventories that prevents interruptions in operating cycle process; higher sales [26] cited in [24] and a reduction of supply costs that reduce both the risk of price fluctuation among business cycles and the risk of losing customers as a result of product scarcity [24]. When more trade credit is extended to customers, conservative working capital policies may increase profitability because extend trade credit ensures that the contracted services have been carried out, making way for customers to check if purchased products and services agreed in quality and quantity terms prior to payment, leading to repeated sales [24]. It also reduces asymmetric information between buyer and seller [24], thereby strengthening the long-term supplier-customer relationships, increasing sales in periods of low demand and reduces transaction costs [24]. The reduction on supplier's financing allows customers to capitalise on prompt payment discounts due to early payments and reduction of the costs of external financing [24].

Conversely, to follow the aggressive working capital policy will imply lower investments in working capital accounts through lower levels of investment in inventories, shortening trade credit to customers and postponing payments to suppliers and that results in an increase in profitability and risk for firms [25,23,24]. According to [25], there is a moderate working capital policy where the firm's risks are moderated; however, the firms would be unable to pay-off matured obligations.

Table 1. Linear relationship between working capital accounts, working capital policies and profitability

	Profitability	Risk	accounts payable	inventories	accounts receivable	WCM investment/length
	Linear relation					
Conservative Policy	Lower	Lower	Shorten	Higher levels	Extended	Higher Investment/Longer
Aggressive Policy	Higher	Higher	Extended	Lower levels	Shorten	Lower Investment/Shorter

Source: Gomes (2013)

The empirical literature gives conflicting results on the relationship between the components of working capital management and profitability. Whiles some studies found a positive relationship between components of working capital management and firm profitability, others studies showed a negative relationship. Also, some studies show no relationship and then again, whilst some of the components are negatively related, others are positively related.

Deloof [2] examined the influence of working capital management on profitability of firms listed on a European Stock market and reported a negative relationship and thus supporting the view that shorter cash conversion cycles increase firm profitability. Other studies found similar results and so supports the theoretical literature [27].

Addae and Nyarko-Baasi [16] used a method of panel data estimation to show the relationship between working capital management and profitability in an emerging market. The results indicated that, there was a negative relationship between accounts receivables, number of day's accounts payable, Days of inventory turnover and firm's profitability.

The impact of working capital management on profitability of 386 Small and Medium Sized Export Companies in Tunisia observed from 2001 to 2008 was studied by [28] using panel data regression models. A negative relationship between gross operating profitability and the days of sales outstanding, the days of inventory outstanding, the days of payable outstanding and the cash conversion cycle was found.

Again, [14] empirically analysed working capital management and its impact on profitability of listed manufacturing firms in Ghana using Panel data obtained from the financial statements of listed manufacturing firms in Ghana for eight (8) years from 2004 to 2011 inclusive. The findings

revealed that working capital cycle is statistically significant but negatively associated with firm profitability. The study also found that inventory turnover period, account receivables collection period and account payables payment period each negatively correlates with profitability.

However several studies reported a positive relationship between working capital management components and profitability. For example in Vietnam, [29] found a positive and significant relationship between payables deferral period and firm profitability. Such findings were also supported by [30] in Kenya, [7] in Nigeria, [8,6] in Ghana. [18] undertook a study to ascertain the relationship between working capital management and the profitability of DMBs in Nigeria by applying the ordinary least square regression. The results indicated a positive relationship between Returns on Equity (ROE), Returns on Assets (ROA) which represented profitability and the elements of working capital management.

Applying multiple regression technique, [31] in studying the impact of working capital management on profitability of Nigerian firms revealed that, aggressive investment working capital policies (TCA/TA) of Nigerian firms have a positive significant impact on profitability measured by return on assets (ROA) whilst aggressive financing working capital policies (TCL/TA) of Nigerian firms have a positive non-significant impact on profitability of Nigerian firms.

Nevertheless, some studies have found that firm profitability is independent of working capital management. [32] studied the relationship between profitability and components of working capital management using a panel data regression model employing a sample of 32 non-financial firms listed on the Zimbabwe Stock Exchange. The regression results show that profitability is not associated with receivables

collection period, inventory conversion period, cash conversion cycle, quick ratio, current asset to total asset ratio, current liabilities to total asset ratio, debt ratio and age of company.

However, the relationship between payables deferral period and profitability is negative and significant, although it is very small. Other studies that found similar results include Sharma and [33], [3] in Mauritius. Also, [25] in their study, Working Capital Management and Financing Decision: Synergetic Effect on Corporate Profitability did not find any significant relationship between the firm's working capital composition and profitability.

Yeboah and Yeboah [15] studying the Effect of Working Capital Management of Ghana Banks on Profitability using for Ordinary Least Square and Panel estimation approach. The two methods produced the same relationship between WCM and profitability. The OLS uses the components of the Cash Conversion Cycle (CCC) (Creditors Payment Period (CPP) and Debt Collection Period (DCP)) and the results showed a negative relationship with profitability whilst the results show that Total Debt to Total Assets (TDA) which measures leverage of the firm has a positive relationship with bank profitability in Ghana. [23] in their attempt to examine whether the relationship between working capital management practices and profitability of Banks engaged all commercial banks from Ghana, over a ten-year period (1999-2008). The study applied a panel data methodology within the framework of the random effects model and the results showed that while cash operating cycle has a significantly positive relationship with bank profitability, just like debtors' collection period, creditors' payment period exhibits a significantly opposite relationship with profitability.

Makori and Jagongo [34] also found the existence of negative correlation between Return on Assets and the firms average collection period and cash conversion cycle but a positive correlation between Return on Inventory Holding Period, Accounts Payment Period when they studied the relationship between working capital management and firm profitability of manufacturing and construction firms listed on Nairobi securities exchange in Kenya.

Furthermore, [35] studied the relationship between working capital management and profitability of listed manufacturing companies in

the Accra Metropolis using panel data regression analysis of cross-sectional and time series data. The components of working capital management used in the study included accounts payable days, inventory days and cash conversion cycle. The results revealed that, there is negative relationship between inventory days, accounts payable day and net operating profit. Cash Conversion Cycle on the other hand is positively related but no statistical significance on profitability.

With these mix results even though some of the studies depended on the same estimation technique but of course at different firms and different sample size, it is therefore not surprising that [36] took it upon themselves to provide a new model for assessing working capital management using the Tehran stock exchange market. The results of their research indicated a lack of an inverse U-shape relationship between CCC and NWC/TA (as the proxy for working capital) and ROA in the Iranian companies, whereas the relationship of current ratio (CR) and quick ratio (QR) with ROA has a significant inverse U-shape one. They argued base on their research findings that, the level of current and quick ratios which were earlier used to serve investors and financial institutions as a base for evaluation of WCM relative merits cannot be recommended to all managers as a reliable measure to rank their companies in terms of liquidity and short-term solvency. Thus, they refute a universal applicability of the desired ratios to all types of companies and this argument can be made for other components of WCM. This goes to support firm-specific study of components of WCM and profit relationships.

3. METHODOLOGY

3.1 Model Specification

Following [15,35,16], the model offered below was applied for the analysis in the study;

In this study, the independent variables is conceptualized as; ratio of current assets to total assets, ratio of current liabilities to total assets and since other variables affect profitability apart from the components of working capital management, debt ratio and size of Global Haulage company limited is included as control variables.

$$ROA_t = f(CATA_t, CLTA_t, DR_t, SIZE_t) \quad (1)$$

To interpret the results as elasticities, the operational form of Equations 3.1 is transformed into log linear form as;

$$\ln ROA_t = \beta_0 + \beta_1 \ln CATA_t + \beta_2 \ln CLTA_t + \beta_3 \ln DR_t + \beta_4 SIZE_t + \nu_t \quad (2)$$

Where,

$\ln CATA_t$ = log of current assets to total assets in time t,

$\ln CLTA_t$ = log of current liabilities to total assets in time t,

$\ln DR_t$ = log of debt ratio in time t,

$SIZE_t$ = Size of Global Haulage company limited in time t,

ν = error term

β_i = parameter $i = 0, 1, 2, 3, 4$

The ratio of current assets to total assets is included in the model since high current assets to total assets ratio implies more liquid the firm and more conservative in working capital investment reducing profitability. It is therefore expected to be negative.

Higher current liability to total asset ratio imply lower investments in working capital accounts through lower levels of investment in inventories, shortening trade credit to customers and postponing payments to suppliers and that results in an increase in profitability and risk for firms. This gives a positive relationship between current liability to total asset ratio and profitability.

A large firm size is expected to be more profitable because of economies of scale and better bargaining power. Firms that are well managed and guard themselves against diseconomies of scale are expected to outperform small firms and so the relationship between size of Global Haulage company limited is expected to be positive.

Also, when debt ratio is low, it implies the company is financially sound and is able to rely on its internal funds. Such companies can therefore increase their profitability; hence the coefficient of debt ratio is expected to be negative. In other words, $\beta_1 < 0$, $\beta_2 > 0$, $\beta_3 < 0$ and $\beta_4 > 0$.

To estimate equation 2, instead of cross-sectional data or panel data, the study employs time series techniques for the reason that advances in time series theories have rendered time series estimates more advantageous over

the use of cross section estimates [36]. According to [37], cross-country regressions cannot provide causal evidence because cross-country differences in respective variables may be as a result of cross-country variation in growth of an economy or development level. This is because, the means of development is linked to changes in relative prices [38] and also to technological advancement which influences firms operations and hence profitability could be a consequent of the process of development. [39] also argues that legal rights concerning wages among others could lead to biasness due to country differences and development levels. Consequently, the study followed the "footsteps" of [40] by employing more in-depth firm-specific times series analysis.

3.2 Data Type and Source

This study employed mainly secondary sources of data for its analysis over the period 1995 to 2013 (19 observations). All the variables are annual data extracted from the annual reports, financial statement and accounts of various years of the Global Haulage Company Limited. Those items that are observed to be showing signs contrary to reasonable expectations from the balance sheet and profit and loss accounts were removed.

3.3 Definition of Variables

3.3.1 Profitability (return on assets [ROA])

To analyse the impact of components of working capital on profitability of Global Haulage Company Limited, Return on Assets (ROA) is used as a proxy for profitability. Profitability can be represented by ROA, return on equity, net operating profit, gross operating profit margin among others. The ROA was chosen as the dependent variable in this study because it relates the profitability of the firm to its asset base hence it is seen as a better measure [41,36].

It was measured as;

$$ROA = \frac{\text{Net Profit after Tax}}{\text{Total Assets}} \quad (3)$$

3.3.2 Current asset to total asset (CATA)

The ratio of current asset to total assets measures a firm's degree of conservativeness in working capital investment policy such that a low

figure imply that, the firm is conservative in working capital.

It is computed as;

$$CATA = \frac{Current\ Assets}{Total\ Assets} \quad (4)$$

3.3.3 Current liabilities to total asset (CLTA)

The current liabilities to total assets ratio measures working capital financing policy of the firm. Firms are regarded as more aggressive in their management of current liabilities when they depend more on the use of current liabilities in which case the firm's liquidity is at risk.

It is represented as;

$$CLTA = \frac{Current\ Liabilities}{Total\ Assets} \quad (5)$$

3.3.4 Size of the firm

Size of a firm can either be calculated as the natural log of sales or the natural log of total assets. Both exist in working capital literature [40,42]. However, the study utilise the natural log of total assets as the measure for size of firm.

It is computed as;

$$SIZE = \ln(Total\ Assets) \quad (6)$$

3.3.5 Debt ratio (DR)

The debt ratio shows the proportion of a firm's debt relative to its assets. It highlights the firm's leverage and potential risks. It is measured by the ratio of total debt (sum of short and long term loans) to total assets.

It is measured as;

$$DR = \frac{Total\ Debt}{Total\ Assets} \quad (7)$$

3.4 Estimation Technique

In this section, the researcher discusses the methodologies used in analyzing the dataset. The following tests were employed: Dickey-Fuller Test for Unit root test for stationarity, Co-integration test, Autoregressive Distributive Lag Model, etc. The study relied on Stata 12 and Eviews 9 statistical computing software for the analysis and all the statistical tests were carried out at 1%, 5% and 10% levels of significance.

3.4.1 Exploratory data analysis

The methodology applied in this section is descriptive statistics. This procedure enabled the researcher to achieve objective one and two and also gives more understanding about the data set and their distributions. The data distribution was examined using standard descriptive statistics namely line graph, mean and standard deviation.

3.4.2 The test for unit root

There exist unit root in most time series data making it a requirement to first test for the existence of unit root in the dataset before estimating coefficients of the model when using time series data. This test also helps determine the order of integration of each of the variables used. A stochastic process is considered to have no unit root if its expected value and variance are constant overtime. If one or more of these conditions are not met then the process is said to have unit root or non-stationary [43].

In such a situation, it is imperative to perform such test in other to find the exact estimated values. The Dickey-Fuller Test (DF) was used to check the stationarity following [44]. The objective of this unit root test is to check whether or not the variables of interest are integrated of order one i.e. $I(1)$ or order zero $I(0)$ before proceeding to estimate the coefficients of the model in order to avoid bogus regression results.

The DF test is performed base on the model generated below;

$$\Delta y = b_0 + b_1 y_{t-1} + \sum_{i=1}^n (B_i \Delta y_{t-i}) + u_t \quad (8)$$

For all $t=0, 1 \dots$ and u is a white Noise. b_0 is the constant term and b_1 is the estimated parameter of the first level lag. y_{t-1} is the first level lag, B_i is the vector of the estimated parameters of the lagged values of the differenced value and Δy_{t-i} stands for the vector of the lagged value of the differenced value of the series. Δ represents the first- differenced operator.

In a unit root test as per the above regressions, the null hypothesis to be tested is that the coefficient of y with one lag is;

$$H_0: b_1=0$$

$$H_1: b_1 \neq 0$$

3.5 Co-integration

When all the time series data for unit root are checked and is established to be integrated, then the study will proceed to test for co-integration among the variables of interest. The variables can be tested by either applying the Engle Granger (1987) estimation method or the Johansen- Juselius estimation method [36,45] to defeat the problem of spurious correlation and misleading inferences. However, the Engle Granger estimation method and the Johansen- Juselius estimation method are rendered inappropriate when the variables are integrated of different orders. The Autoregressive Distributed lag (ARDL) bounds test is appropriate in such a situation. The co-integration test will help to determine whether a group of non-stationary series is co-integrated or not. If the variables are co-integrated, the relationship may be taken to mean a long run relationship. Therefore, in this study the ARDL bounds test method was used.

3.6 The ARDL Co-integration Test

This study employs the autoregressive distributed lag (ARDL) technique to test for the long-run and short-run impact of components of working capital management on profitability in Global Haulage Company Limited. The ARDL model is employed for this study because; the ARDL model is a highly significant approach to find the co-integration even with small sample size. Also, the ARDL approach does not need all of the variables to be integrated of the same order unlike other co-integration techniques which requires that; the ARDL technique can be applied whether the variables are $I(1)$ and/or $I(0)$. In effect, the ARDL technique avoids the pre-testing problems connected to standard co-integration, which demands that the variables be already categorised into $I(1)$ or $I(0)$ [46]. This model is even the more appropriate model for empirical work in a case where the stationarity properties of the data are uncertain. [47] observe that, in ascertaining the order of integration of each variable in the model, the result may differ depending on which test one uses hence the results could contradict. For instance, when one apply the Augmented Dickey Fuller and the Phillips-Perron tests for unit root, it is easy to wrongly conclude that there is nonstationarity when there is actually stationarity around a one-time structural break. The ARDL approach is therefore the best for this study because it avoids these problems.

In order to run the long run estimation, the conditional error correction (ECM) version of the ARDL Bounds test was first applied to check for long run relationship. The various lags of the variables are expected by the Akaike Information Criterion (AIC).The dynamic structure of the ARDL (p, q) model takes the following form;

$$\begin{aligned} \Delta \ln R_t = & \alpha_0 + \sum_{i=1}^p a_i \Delta \ln CATA_{t-i} + \sum_{i=0}^p b_i \Delta \ln CLTA_{t-i} + \sum_{i=0}^p c_i \Delta \ln DR_{t-i} \\ & + \sum_{i=0}^p d_i \Delta SIZE_{t-i} + \delta_1 \ln R_{t-1} + \delta_2 \ln CATA_{t-1} + \\ & \delta_3 \ln CLTA_{t-1} + \delta_4 \ln DR_{t-1} + \delta_5 SIZE_{t-1} + u_t \end{aligned} \quad (9)$$

Where all the variables are as defined earlier and Δ is the first difference operator. The parameters a, b, c, d, e, f, j denote the short run dynamics of model 9 to be estimated through the error correction framework and δ_i are the long run multipliers in the ARDL model with α as constant and v as disturbance term.

The ARDL framework is carried out in three stages [46]. First, the presence of co-integration predicted by the theory is tested using an F-test. The F statistic tests for the joint significance of all the lagged levels variables (coefficient of the long run effect). The null hypothesis of no co-integration among the variables of interest is tested against the alternative hypothesis as stated below;

$$\begin{aligned} H_0: & \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = 0 \\ H_1: & \text{Not all the } \delta_i \text{ is zero} \end{aligned}$$

The two critical values bounds presents a cointegration test when the independent variables are $I(h)$ (where $0 \leq h \leq 1$): a lower value assuming the regressors are $I(0)$ and an upper value assuming purely $I(1)$ regressors. If the F-statistic is greater than the upper critical value, the null hypothesis of no co-integration is rejected regardless of the orders of integration. The null hypothesis cannot be rejected if the F-statistic is below the lower bound. If the result falls between the lower and upper bounds, the result is inconclusive.

3.7 Diagnostic and Stability Tests

In every research work, the results should be reliable for policy implementation. Hence diagnostic tests are done to examine the reliability of the results of the study. The study tested for the significance of the variables and

other diagnostic tests such as serial correlation, functional form, normality; heteroscedasticity and structural stability of the model were carried out.

The Breusch-Pagan-Godfrey test for heteroscedasticity, Breusch-Godfrey Serial Correlation LM Test for serial correlation, the Jacque-Berra test for normality and also, the Ramsey RESET Test for stability were applied in the analysis of diagnostic and stability tests of the long-run coefficients together with the short-run dynamics. The Breusch-Pagan-Godfrey test involves testing the null hypothesis that the error variances are all equal against the alternative hypothesis that the error variances are a multiplicative function of one or more variables. A large chi-square would indicate that, heteroskedasticity is present, thus it indicate that the error term is a multiplicative function of the predicted values. The Breusch-Godfrey Serial Correlation LM Test was employed to test whether adjacent residuals are correlated which is in violation of the regression assumption that the error terms are independent. The Breusch-Godfrey test can be used when (1) the independent variables are stochastic or not (2) the regression equation is autoregressive or not (3) whether the regression equation is first order autoregressive or higher order autoregressive.

The null hypothesis states that, the error terms are uncorrelated whilst the alternative hypothesis states that the error terms are correlated. Therefore, when the null hypothesis is accepted, it implies that the error terms are not correlated otherwise they are correlated.

Following [46], the stability of the regression coefficients is evaluated by the Ramsey RESET Test for stability and they can show whether or not the regression equation is stable over time. This stability test is appropriate in time series data, especially when we are uncertain about when structural change might have taken place.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1 Trend Analysis of Profitability (ROA)

Fig. 1 shows the linear trend for profitability (ROA) of Global Haulage Company Limited between the period 1995 and 2013. The graph suggests that return on assets which is a proxy for profitability did not experience a constant trend from 1995 to 2013. ROA kept fluctuating from 1995 till it got to its lowest point in 2010 and rose to peak highly around the year 2012.

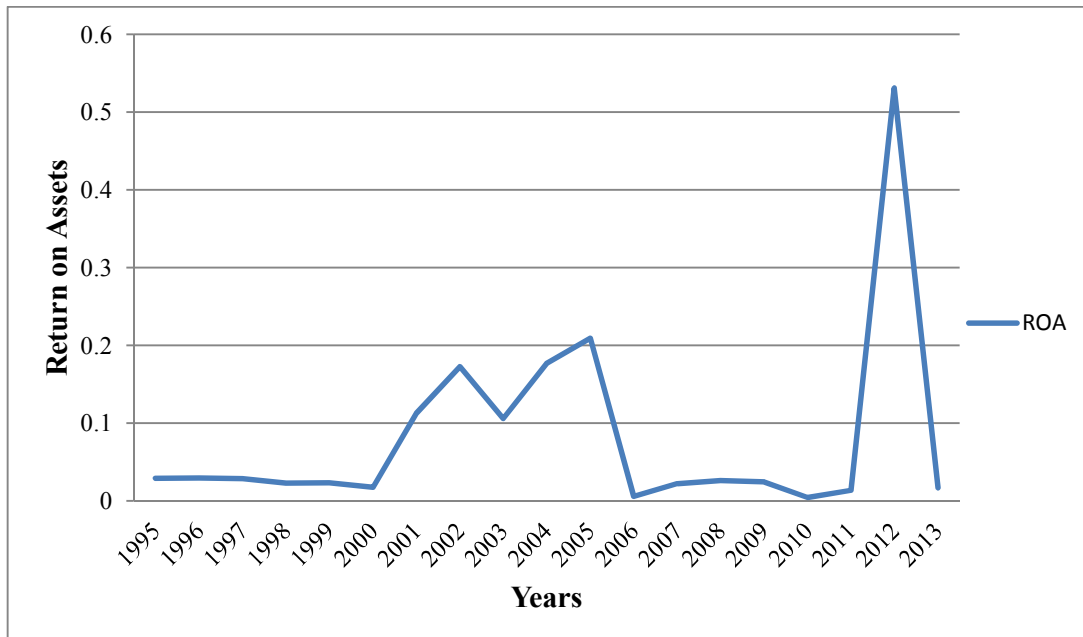


Fig. 1. Trend analysis of profitability (ROA)
 Source: global haulage company limited annual financial statements

From Fig. 1, ROA started with a negative trend from 1995 moving downwards until the year 2000 where it started picking up, increasing steadily to 2002 where ROA recorded a figure of 0.172447. From there, it drop again in 2003 and began to rise again. The negative trend or low ROA could be as a result of poor management practices and also, the implementation of the structural adjustment programme in 1993 where exchange rate liberalization, tightening of monetary policy, foreign trade reforms, financial sector reforms and price deregulation were adopted might have had a toll on companies in Ghana including Global Haulage Company. ROA continued to rise from 2003 to 2005 and fell abruptly from 0.209 in 2005 to 0.006 in 2006. From 2006, ROA maintained a low figure but increased and had a constant trend until it fell to its lowest point in 2010 at 0.004 over the study period. The high taxes to make up for the over spending in 2004 due to the elections coupled with the revaluation of the Ghanaian cedi in 2007 may have made things difficult for the management hence the fall in ROA from 2004 to 2010. ROA began to rise a bit from 2010 and suddenly jumped to its highest peak over the study period in 2012 to 0.531. ROA had a negative trend from 2012 to 2013. Generally, ROA had a low and stable trend for most of the years in the study.

4.2 Trend Analysis of Working Capital

Fig. 2 shows the linear trend for working capital which is the difference between current assets and current liabilities of Global Haulage Company limited from 1995 to 2013. From the graph, working capital seems to maintain a constant horizontal trend for most of the years under study. However, working capital experience steep rise and falls in the latter part of the period under study. Working capital had its lowest point in 2010 and peaked highly around the year 2012.

From Fig. 2, working capital of Global Haulage Company limited starting from 1995, maintained a horizontal trend steadily up to 2003. From 2003, working capital began to fall with little fluctuations, maintaining the negative trend until 2010 where it recorded its lowest over the period to -19336467.30 in Ghana cedis. The negative figure means that current liabilities were more than current assets implying that liquid assets for operational cost were inadequate. Working capital sharply rose from 2010 to 89513599.60 Ghana cedis in 2012 and thereafter falls again to 55565827.40 Ghana cedis in 2013.

4.3 Results and Analysis of the Unit Root Test

The unit root test was conducted by applying the Dickey Fuller (DF). Table 2 shows the results of the DF unit root test at levels and at first difference. The DF test employed included a constant only for both tests. From the table, the null hypothesis were rejected for the variables; log of return on assets (LNROA), log of current liabilities (LNCLTA) (both at 5% significance levels), log of debt ratio (LNDR) (at 1% significance levels), and log of current assets to total assets ratio (LNCATA) (at the 10% significance levels) in their levels which imply they achieved stationarity at their levels, whilst only firm size (SIZE) was stationary at first difference at 1% significance levels. Therefore, not all the underlying series in the present study are integrated of order one [i.e. $I(1)$] and there is no $I(2)$ variable hence the reason for applying ARDL model.

4.4 Results and Analysis of the Co-integration Test

The autoregressive distributed lag (ARDL) bounds test was used to estimate for the presence of co-integration. The study selected the maximum number of lags as 4 using the Akaike Information Criterion (AIC) for the equations. Using the bounds test, when the F-statistic is greater than critical value bounds, reject the null hypothesis that there is no co-integration otherwise accept.

From Table 3, the F- statistic (4.734) is more than the 5% upper critical value bound. Therefore, the null hypothesis is rejected implying that there is co-integration between the components of working capital management and the company's profitability. Having established the co-integration among the variables, the ARDL method is applied in the estimation of the parameters of the equation 3.4 in chapter three.

4.5 Results and Analysis of the Long Run Relationship

The equation 9 was estimated for Global Haulage Company Limited using annual data from 1995-2013 using the ARDL estimation technique. The results are based on the Akaike Information Criterion (AIC) using a maximum lag of one for equation 9. The results of the long-run estimates are presented in Table.

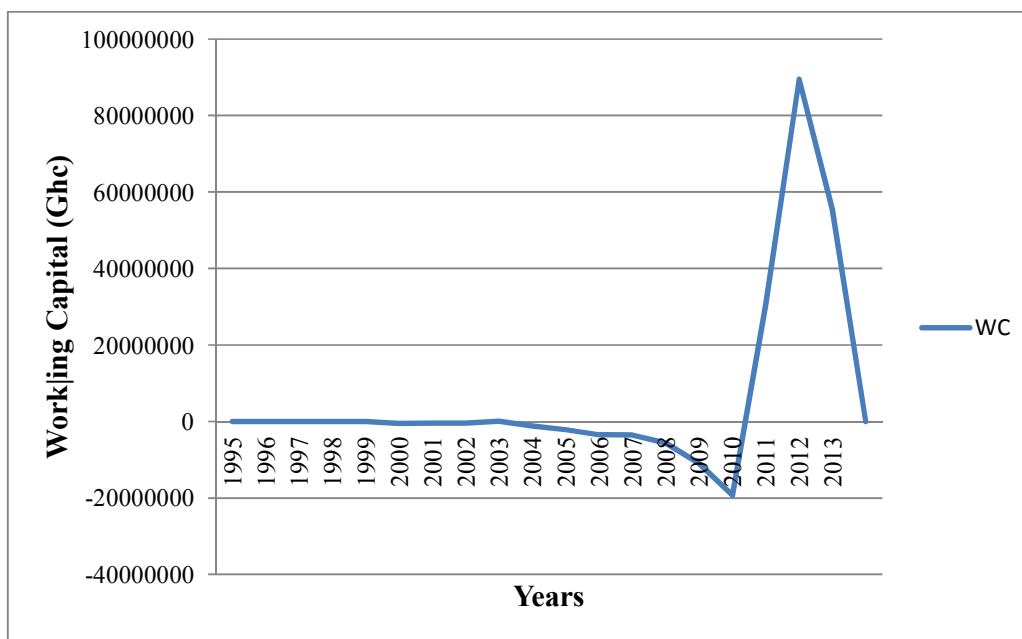


Fig. 2. Trend analysis of working capital

Source: global haulage company limited annual financial statement

Table 2. Dickey fuller unit root results

Variable	Level	First difference
LNROA	-3.466 I(0)**	-6.099*
LNCATA	-2.853 I(0)***	-6.343*
LNCLTA	-3.030 I(0)**	-5.135*
LNDR	-3.943 I(0)*	-6.506*
SIZE	-1.228	-4.300 I(1)*

Note: I (0), I (1) denotes integration of order zero and order one, and *, ** and *** indicates significance at the 1%, 5% and 10% level respectively. The null hypothesis for the DF is unit root is present
 LNROA=log of return on assets, LNCATA=log of current assets to total assets ratio, LNCLTA=log of current liabilities to total assets, LNDR=log of debt ratio and SIZE=firm size

Table 3. Bounds test results for the existence of co-integration

Test statistic	Value	K
F-statistic	4.734**	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
1%	3.74	5.06

Note: ** indicates significance at the 5% level

From Table 4, only one variable is statistically significant in the long run and only one variable did not meet its expected theoretical signs. Whilst log of current liabilities to total assets ratio (LNCLTA), log of current assets to total assets (LNCATA), log of debt ratio (LNDR) meet their theoretical signs, firm size (SIZE) did not meet its theoretical sign. Also, whilst LNCATA, SIZE,

LNDR is not statistically significant, LNCLTA is statistically significant.

The coefficient of LNDR is -3.054 are interpreted as, a 1% increase in debt ratio willlead to 3.054% decrease in return on assets which represents profitability. This means that ROA is elastic with respect to debt ratio. However, this coefficient is

statistically not significant. Return on assets is elastic with respect to current liabilities to total assets ratio with a coefficient of 3.483. This means that, when current liabilities to total assets ratio increases by a percentage unit, return on assets respond by increasing more by 3.48%. This result meet what theory says in terms of the sign and it is statistically significant at 5% significant level. Higher current liability to total asset ratio imply lower investments in working capital accounts through lower levels of investment in inventories, shortening trade credit to customers and postponing payments to suppliers and that results in an increase in profitability.

Though current assets to total assets ratio meet the theoretical sign, it is not significant. The coefficient -0.155 means that, a one unit increase in CATA will cause ROA to decrease by 0.155.

4.6 Results and Analysis of the Short Run Dynamic Model

The next step is to investigate the short run dynamics within the ARDL framework having estimated the long run co-integration model. Thus all the values of the variables at levellagged is retained in the ARDL model. Estimation results based on the Akaike Information Criterion are presented in the Table 5.

Basically, the Error Correction Model (ECM) reconciles the short-run behaviour of the variables with their long-run behaviour. The coefficient of ECM indicates the speed of convergence to reestablish equilibrium in the dynamic model. The ECM coefficient presents how quick variables can return to stability and it is expected to be significant with a negative sign. Table 5 shows the expected negative sign of ECM is highly significant. This confirms the existence of the co-integration relationship among the variables in the model yet again. The coefficient of ECM_{t-1} of -0.557 implies that the deviation from the long-term return on assets equilibrium is corrected by 55.70% by the coming year.

The short run results maintained the results in the long run in terms of the sign and the elasticity status of the variables. In the short run, except log of current assets to total assets ratio (LNCATA), all the variables such as log of debt ratio (LNDR), log of current liabilities to total assets ratio (LNCLTA) and firm size (SIZE) are statistically significant in the model. Whilst LNDR and LNCLTA are elastic, LNCATA and SIZE are inelastic as shown in Table 5.

Debt ratio is statistically significant at 1% significance level and its coefficient -2.32 implies that, a percentage unit increase in debt ratio will lead to a 2.32% decrease in return on assets. This result conforms to the findings of [24,34].

LNCLTA has a coefficient of 3.053 which means that, a 1% increase in LNCLTA will lead to a 3.05% increase in LNROA in the short run similar to the result in the long run. LNCLTA is also statistically significant at 1% significance level. [34] also had similar findings in his study.

Current assets to total assets ratio remain to be negatively related to return on assets and statistically not significant in the short run. The coefficient -0.085 is interpreted as, a unit increase in LNCATA will result in a 0.085 decrease in LNROA. Finally, firm size surprisingly is negatively related to the firm's profitability, contrary to apriori expectation and was statistically significant at 1% significance level. The coefficient -0.822 implies that, when firm size increase by a unit, LNROA falls by 0.822. This might be as a result of diseconomies of scale due to managerial inefficiency arising from expansion of the firms operations and branches. Also, it could be that managers expand firm size to achieve their own parochial interest such as benefits associated with a larger firm since they will receive higher remuneration when the firm increases in size. The findings is consistent with [15] but contradicts the findings of [32].

4.7 Model Diagnostics and Goodness of Fit

The coefficient of determination (Adjusted R-Squared) shows that, about 76.37% of the variations in return on assets are explained by the predictors which include current liabilities to total assets ratio, current assets to total assets ratio, firm size and debt ratio. The F-statistic is also statistically significant at 1% significance level which means that all the predictors jointly determines the level of return on assets in Global Haulage Company Limited.

The model passed all the diagnostic tests including the serial correlation test, the heteroscedasticity test, normality test and correct functional form test as presented on the table 6. The diagnostic tests in the regression model are presented in Table 6. Based on these probability statistics from the regression, the model is good for analysis and policy interpretation.

Table 4. ARDL long run results

Dependent variable: LNROA
Selected model: ARDL(1, 1, 1, 0, 1)
Sample: 1995 – 2013

Variable	Coefficient	Std. error	Prob.
Constant	-0.611	2.017	0.769
LNDR	-3.054	1.85	0.134
LNCLTA	3.483	1.219	0.019**
LNCATA	-0.153	0.435	0.733
SIZE	-0.155	0.135	0.280

Note: *, ** and *** indicates significance at the 1%, 5% and 10% level respectively. LNROA=log of return on assets, LNCATA=log of current assets to total assets ratio, LNCLTA=log of current liabilities to total assets, LNDR=log of debt ratio and SIZE=firm size

Table 5. Estimated short run error correction model using the ARDL estimation technique

Dependent variable: LNROA
Selected model: ARDL(1, 1, 1, 0, 1)
Sample: 1995 – 2013

Variable	coefficient	std. error	prob.
D(LNDR)	-2.320	0.551	0.002***
D(LNCLTA)	3.053	0.502	0.000***
D(LNCATA)	-0.085	0.252	0.742
D(SIZE)	-0.822	0.189	0.002***
ECM _{t-1}	-0.557	0.208	0.025**
Cointeq= LNROA - (-3.0538*LNDR + 3.4834*LNCLTA -0.1531*LNCATA -0.1550*SIZE -0.6107)			

Note: *** and ** indicates significance at the 1% and 5% level respectively. LNROA=log of return on assets, LNCATA=log of current assets to total assets ratio, LNCLTA=log of current liabilities to total assets, LNDR=log of debt ratio and SIZE=firm size

Table 6. Model diagnostics and goodness of fit

Model Criteria/Goodness of Fit

R-Sq|uared 0.875 R-Bar-Sq|uared 0.763737
 S.E. of Residuals 1.013 F-stat. 7.869[P-value 0.003]
 Mean of Dependent Variable -2.767 S.D. of Dependent Variable 2.084
 Residual Sum of Sq|uares 9.237 Eq|uation Log-lik|elihood -19.537
 DW-statistic 2.436

Diagnostics	Test Statistic
$\chi^2_{Auto}(3)$	5.334 [0.149]
$F_{RESET}(3,6)$	2.743 [0.135]
$\chi^2_{Norm}(1)$	1.522 [0.467]
$\chi^2_{HETERO}(8)$	6.442 [0.598]

χ^2_{Auto} , F_{Reset} , χ^2_{Norm} and χ^2_{HETERO} are Breusch-Godfrey Lagrange multiplier statistics for test of serial correlation, Ramsey Reset test for functional form misspecification, Jacque- Bera test for non-normal errors and Breusch-Pagan-Godfrey test for heteroskedasticity, respectively. These statistics are distributed as F- statistic and Chi-square values with degree of freedom in brackets (). Values in parentheses [] are probability values

5. DISCUSSION OF FINDINGS

The study indicated that debt ratio is negatively related to profitability, showing that Global Haulage Company Limited debt ratio is less profitable. Since high debt ratio adversely impact

on profitability, management should use less of debt in financing their activities to be able to increase profit. This result conforms to the findings of [48,24,34]. [34] also found the existence of negative correlation between Return on Assets and the firms average collection period

and cash conversion cycle but a positive correlation between Return on Inventory Holding Period, Accounts Payment Period when they studied the relationship between working capital management and firm profitability of manufacturing and construction firms listed on Nairobi securities exchange in Kenya.

Also, the study revealed that there is a significant relationship between current liability to total assets ratio on profitability. This accounted through lower levels of investment in inventories, shortening trade credit to customers and postponed payments to suppliers and that results in an increase in profitability. By implication, aggressive working capital policy which lowers investments in working capital thereby increasing current liability to total asset ratio is appropriate if management's goal is to increase profit. Hence aggressive working capital policies should be pursued cautiously since it also poses risk to the company. The conservative working capital policy as described by [25] and [23] showed that higher levels of inventories, larger quantity of current assets in relation to total assets extends more trade credit to customers and reduce supplier's financing which results in a lower profitability and lower risk. [46] as cited in [24] opined that a reduction of supply costs reduces both the risk of price fluctuation among business cycles and the risk of losing customers as a result of product scarcity. When more trade credit is extended to customers, conservative working capital policies may increase profitability because extend trade credit ensure that the contracted services have been carried out, making way for customers to check if purchased products and services are as agreed in quality and quantity terms prior to payment, leading to repeated sales [24]. It also reduces asymmetric information between buyer and seller [24], thereby strengthening the long-term supplier-customer relationships, increasing sales in periods of low demand and reduces transaction costs [24]. The reduction on supplier's financing allows customers to capitalise on prompt payment discounts due to early payments and reduction of the costs of external financing [24]. The findings of this study are in agreement with [29]. [29] indicated a positive and significant relationship between payables deferral period and firm profitability. Such findings were also supported by [30] in Kenya, [7] in Nigeria, [8] and [6] in Ghana.

The significant negative relationship between firm size and firm profitability suggest that the

firm is experiencing diseconomies of scale due to managerial inefficiency arising from expansion of the firms operations and branches or managers expand the firm size to achieve their own parochial interest such as benefits associated with a larger firm and therefore will do whatever it takes regardless of some warning signs. The findings are consistent with [15] but contradicts the findings of [32]. Therefore, policy makers should therefore put in place measures to check these managerial inefficiencies and self-interest of managers to improve the profitability of the firm.

6. CONCLUSION

This article empirically studied the impact of working capital management on firm profitability in Ghana using Global Haulage Company limited as a case by applying time series data extracted from financial statements and annual reports of the company from 1995 to 2013. From the results, except current liability to total assets ratio which is significant in the long run, all the variables are only significant in the short run. Current assets to total assets ratio is not significant both in the short run and the long run. In essence, this study has shown that effective working capital management is a necessity for improving firm profitability. Therefore, managers of Global Haulage Company Ltd. must employ efficient and effective working capital management policies and practices for better performance of their company.

7. LIMITATION AND AREAS FOR FURTHER RESEARCH

This study is only limited to one haulage company (Global Haulage Company Limited) in Ghana even though there are several haulage companies in the country. One of the main drawbacks usually encountered in studies of this nature in developing countries like Ghana is the unavailability of reliable data. As a result, the selection of a relatively small sample size for the analysis became inevitable. Caution should therefore be exercised in generalizing its findings to all service companies or to companies in other industries.

Although the objectives of the study were achieved, the study applied few proxy variables for components of working capital management which may be bias estimators of the unobserved variables. For instance, components such as ratio of current assets to total assets, current

liability to total assets ratio were used in contrast to studies that used several proxy variables including current ratio, average collection period, inventory turnover.

It is therefore suggested that in-depth studies including these other factors are necessary. The scope of the study may also be extended to cover a larger sample of companies over a longer period of time to yield more insights into the study of the variables of interest in this study.

COMPETING INTERESTS

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly used products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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