

**THE IMPACT OF WORKING CAPITAL MANAGEMENT ON PROFITABILITY
OF GLOBAL HAULAGE COMPANY, GHANA**

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.

Keywords: Working capital, Profitability, Working capital management, Firm, Global Haulage Company Ltd, Ghana

25 **1. INTRODUCTION**

26 Traditionally, there are four financing decisions which every financial manager makes in the
27 day-to-day running of the firm. They include investment decisions (long-term asset mix);
28 financing decisions (capital-mix); dividend decisions (profit allocation) and the liquidity
29 decisions (short-term asset-mix). The economy of Ghana until 2006 was dominated by
30 agriculture, but is now led by service accounting for about 51% of national output (Ghana
31 Millennium Development Goals Report, 2010). This shows how very vital the service sector
32 has become in terms of job creation and gross domestic product growth in the Ghanaian
33 economy. With the enormous benefits that the economy gain from the service sector, except
34 few which are based on the financial sector, specific studies on working capital management
35 and profitability focusing on service companies in Ghana are largely unavailable. Generally,
36 although several studies have examined the nature of the relationship between working
37 capital management and profitability of firms (Deloof, 2003; Padachi, 2006; Raheman and
38 Nasr, 2007; Raheman et al., 2010; Akoto et al., 2013), there is no consensus on the nature of
39 this relationship. Some literature suggests that cash conversion cycle (a proxy for working
40 capital management) is positively related to firm profitability (Falope and Ajilore, 2009;
41 Gill et al, 2010; Akoto et al., 2014), implying that longer cash conversion cycles increase the
42 firm's profitability. On the other hand, other studies however, suggests that shorter cash
43 conversion cycles increase the firm's profitability (Deloof, 2003; Wang, 2002; Lazaridis
44 and Tryfonidis, 2006). Thus a study such as this, contributes significantly and adds value to
45 the existing literature on working capital management and firm profitability nexus.

46 Working capital starvation is generally credited as a major cause if not the major cause of
47 small and medium scale business failure in many developed and developing countries
48 (Rafuse, 1996). The success of a firm depends ultimately, on its ability to generate cash
49 receipts in excess of disbursements. The cash flow problems of many small businesses are

50 exacerbated by poor financial management and in particular the lack of planning cash
51 requirements (Jarvis et al., 1996). It has therefore become imperative that managers
52 understand how working capital management relate to the profitability of their business.
53 Most especially, the economy of Ghana recently has been going through macroeconomic
54 challenges where GDP growth rate is falling, high interest rate making it impossible for
55 companies to borrow and expand its operations. An economy with deteriorating currency
56 which makes it difficult for companies to do foreign trade. Inflation and unemployment
57 cannot be left out because of its effects on companies with this everlasting "dumsor" (load
58 shedding). In the light of the above, it is very crucial that critical attention is given to the
59 performance of working capital management on profitability of firms in Ghana. Based on this
60 background, this paper aims to examine the relationship between working capital
61 management and profitability of firms in Ghana using Global Haulage Company Ltd as a
62 case study.

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

72 **2. LITERATURE REVIEW**

73 Adu (2013) claims that the concept of working capital was first advanced by Carl Marx
74 (1867) even though Marx did not explicitly mention working capital in his work. She claims
75 that, workers gave credit to the firm by accepting periodical payment of wages which funded
76 a portion of work-in-process. Thus, the concept of working capital as it is understood today,

77 is embedded in Marx's 'variable capital' which was used to mean expenditure for payrolls
78 advanced to workers before they complete the goods they are working on.

79 Working capital refers to short-term resources available to a company for financing its day-
80 to-day activities (Korankye and Adarquah, 2013). Yeboah and Yeboah (2014) defined
81 working capital as the investment required for running daily business activities. In the same
82 vein, Addae and Nyarko-Baasi (2013) said working capital meets the short-term financial
83 requirements of a business enterprise and thus referred to working capital as a trading capital,
84 not retained in the business in a particular form for longer than a year. They further claimed
85 that the money invested changes form and substance during the normal course of business
86 operations.

87

88 Performance of firms is judged based on whether its profitability is high or low. Profitability
89 can be measured on gross profit margin, operating profit margin, net profit margin, return on
90 asset and/or return on equity (Nurazleena, Norazida and Wan Nazihah, 2015). The term
91 profitability as defined by Adagye (2015) is the ability of the business organization to
92 maintain its profit year after year. Athanasoglou, Brissimis and Delis (2005) also defined
93 profitability as the ability of the firm to generate more revenue than cost, in relation to the
94 firm's capital base. Profitability is therefore importance because it is the main purpose of
95 business (Adagye, 2015).

96 Rao and Lakew (2012) asserted that ratios instead of the real value of profits are used in
97 measuring firm profitability. This implies that ratios are not influenced by variations in the
98 general price level and are the most frequently used in measuring bank profitability in the
99 banking literature. The return on asset (ROA) and the return on equity (ROE) are ratios
100 extensively used to measure profitability of firms (Rao and Lakew, 2012).

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

107 Return on Assets (ROA) which is computed as the firms' after tax profit over total assets
 108 (Flemini et al., 2009) indicates how effectively a firm manages its assets to generate income
 109 (Davydenko, 2010). ROA according to Flemini et al. (2009) may be biased due to off-
 110 balance-sheet activities where ROA is overstated in the evaluation of firm profitability, but
 111 believe such activities are negligible. Nonetheless, it has always been a very good and
 112 preferred measure of profitability.

113 Although profitability does not necessarily mean liquidity, profitability ensures firm survival,
 114 growth and debatably, firm's liquidity levels (Agyei and Yeboah, 2011). Profitability is
 115 influenced by either internal factors or external factors. The internal factors refers to those
 116 factors that the firm can control some of which include capital structure, size, growth, age,
 117 management efficiency, reputation among others whilst the external factors are those beyond
 118 the control of the firm such as economic conditions (interest rate, Exchange rate risk,
 119 inflation, etc).

120 **Table 1: Linear Relationship between Working Capital Accounts, Working Capital**
 121 **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	Higher	Higher	Extended	Lower	Shorten	Lower

Policy				levels		Investment/Shorter
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122 Source: Gomes (2013)

123 The choice of working capital policy affects the profitability of firms. The conservative
 124 working capital policy as described by Gomes (2013), Ajibolade and Sankay (2013) and
 125 Agyei and Yeboah (2011) implies a higher investment in working capital accounts. For
 126 instance, higher levels of inventories, larger quantity of current assets in relation to total
 127 assets extending more trade credit to customers and reducing supplier's financing result in a
 128 lower profitability and lower risk. However, empirical studies show that conservative
 129 working capital policy positively affect profitability due to higher levels of inventories that
 130 prevents interruptions in operating cycle process; higher sales (Petersen and Rajan, 1997
 131 cited in Gomes, 2013) and a reduction of supply costs that reduce both the risk of price
 132 fluctuation among business cycles and the risk of losing customers as a result of product
 133 scarcity (Gomes, 2013). When more trade credit is extended to customers, conservative
 134 working capital policies may increase profitability because extend trade credit ensures that
 135 the contracted services have been carried out, making way for customers to check if
 136 purchased products and services agreed in quality and quantity terms prior to payment,
 137 leading to repeated sales (Gomes, 2013). It also reduces asymmetric information between
 138 buyer and seller (Smith, 1987 in Gomes, 2013), thereby strengthening the long-term supplier-
 139 customer relationships, increasing sales in periods of low demand and reduces transaction
 140 costs (Gomes, 2013). The reduction on supplier's financing allows customers to capitalise on
 141 prompt payment discounts due to early payments and reduction of the costs of external
 142 financing (Gomes, 2013).

143 Conversely, to follow the aggressive working capital policy will imply lower investments in
 144 working capital accounts through lower levels of investment in inventories, shortening trade
 145 credit to customers and postponing payments to suppliers and that results in an increase in
 146 profitability and risk for firms (Ajibolade and Sankay, 2013; Agyei and Yeboah, 2011;

147 Gomes, 2013). According to Ajibolade and Sankay (2013), there is a moderate working
148 capital policy where the firm's risks are moderated; however, the firms would be unable to
149 pay-off matured obligations.

150

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

157

158 Deloof (2003) examined the influence of working capital management on profitability of
159 firms listed on a European Stock market and reported a negative relationship and thus
160 supporting the view that shorter cash conversion cycles increase firm profitability. Other
161 studies found similar results and so supports the theoretical literature (Mohamad and Noriza,
162 2010; Raheman and Nasr, 2007; Shin and Soenen, 1998).

163

164 Addae and Nyarko-Baasi (2013) used a method of panel data estimation to show the
165 relationship between working capital management and profitability in an emerging market.
166 The results indicated that, there was a negative relationship between accounts receivables,
167 number of day's accounts payable, Days of inventory turnover and firm's profitability.

168

169 The impact of working capital management on profitability of 386 Small and Medium Sized
170 Export Companies in Tunisia observed from 2001 to 2008 was studied by Bellouma (2011)
171 using panel data regression models. A negative relationship between gross operating

172 profitability and the days of sales outstanding, the days of inventory outstanding, the days of
173 payable outstanding and the cash conversion cycle was found.

174

175 Again, Korankye and Adarquah (2013) empirically analysed working capital management
176 and its impact on profitability of listed manufacturing firms in Ghana using Panel data
177 obtained from the financial statements of listed manufacturing firms in Ghana for eight (8)
178 years from 2004 to 2011 inclusive. The findings revealed that working capital cycle is
179 statistically significant but negatively associated with firm profitability. The study also found
180 that inventory turnover period, account receivables collection period and account payables
181 payment period each negatively correlates with profitability.

182

183 However several studies reported a positive relationship between working capital
184 management components and profitability. For example in Vietnam, Dong and Su (2010)
185 found a positive and significant relationship between payables deferral period and firm
186 profitability. Such findings were also supported by Mathuva (2010) in Kenya, Falope and
187 Ajilore (2009) in Nigeria, Gill et al (2010) and Akoto et al. (2013) in Ghana. Adagye (2015)
188 undertook a study to ascertain the relationship between working capital management and the
189 profitability of DMBs in Nigeria by applying the ordinary least square regression. The results
190 indicated a positive relationship between Returns on Equity (ROE), Returns on Assets (ROA)
191 which represented profitability and the elements of working capital management.

192

193 Applying multiple regression technique, Onwumere, Ibeand Ugbam (2012) in studying the
194 impact of working capital management on profitability of Nigerian firms revealed that,
195 aggressive investment working capital policies (TCA/TA) of Nigerian firms have a positive
196 significant impact on profitability measured by return on assets (ROA) whilst aggressive

197 financing working capital policies (TCL/TA) of Nigerian firms have a positive non-
198 significant impact on profitability of Nigerian firms.

199

200 Nevertheless, some studies have found that firm profitability is independent of working
201 capital management. Zawaira and Mutenheri (2014) studied the relationship between
202 profitability and components of working capital management using a panel data regression
203 model employing a sample of 32 non-financial firms listed on the Zimbabwe Stock Exchange.
204 The regression results show that profitability is not associated with receivables collection
205 period, inventory conversion period, cash conversion cycle, quick ratio, current asset to
206 total asset ratio, current liabilities to total asset ratio, debt ratio and age of company.

207

208 However, the relationship between payables deferral period and profitability is negative and
209 significant, although it is very small. Other studies that found similar results include Sharma
210 and Kumar (2011) and Ganesan (2007), Padachi (2006) in Mauritius. Also, Ajibolade and
211 Sankay (2013) in their study, Working Capital Management and Financing Decision:
212 Synergetic Effect on Corporate Profitability did not find any significant relationship between
213 the firm's working capital composition and profitability.

214

215 Yeboah and Yeboah (2014) studying the Effect of Working Capital Management of Ghana
216 Banks on Profitability using for Ordinary Least Square and Panel estimation approach. The
217 two methods produced the same relationship between WCM and profitability. The OLS uses
218 the components of the Cash Conversion Cycle (CCC) (Creditors Payment Period (CPP) and
219 Debt Collection Period (DCP)) and the results showed a negative relationship with
220 profitability whilst the results show that Total Debt to Total Assets (TDA) which measures
221 leverage of the firm has a positive relationship with bank profitability in Ghana. Agyei and

222 Yeboah (2011) in their attempt to examine whether the relationship between working capital
223 management practices and profitability of Banks engaged all commercial banks from Ghana,
224 over a ten-year period (1999-2008). The study applied a panel data methodology within the
225 framework of the random effects model and the results showed that while cash operating
226 cycle has a significantly positive relationship with bank profitability, just like debtors'
227 collection period, creditors' payment period exhibits a significantly opposite relationship
228 with profitability.

229

230 Makori and Jagongo (2013) also found the existence of negative correlation between Return
231 on Assets and the firms average collection period and cash conversion cycle but a positive
232 correlation between Return on Inventory Holding Period, Accounts Payment Period when
233 they studied the relationship between working capital management and firm profitability of
234 manufacturing and construction firms listed on Nairobi securities exchange in Kenya.

235

236 Furthermore, Agyemang and Asiedu (2013) studied the relationship between working capital
237 management and profitability of listed manufacturing companies in the Accra Metropolis
238 using panel data regression analysis of cross-sectional and time series data. The components
239 of working capital management used in the study included accounts payable days, inventory
240 days and cash conversion cycle. The results revealed that, there is negative relationship
241 between inventory days, accounts payable day and net operating profit. Cash Conversion
242 Cycle on the other hand is positively related but no statistical significance on profitability.

243 With these mix results even though some of the studies depended on the same estimation
244 technique but of course at different firms and different sample size, it is therefore not
245 surprising that Fahim et al. (2015) took it upon themselves to provide a new model for
246 assessing working capital management using the Tehran stock exchange market. The results

247 of their research indicated a lack of an inverse U-shape relationship between CCC and
 248 NWC/TA (as the proxy for working capital) and ROA in the Iranian companies, whereas the
 249 relationship of current ratio (CR) and quick ratio (QR) with ROA has a significant inverse U-
 250 shape one. They argued base on their research findings that, the level of current and quick
 251 ratios which were earlier used to serve investors and financial institutions as a base for
 252 evaluation of WCM relative merits cannot be recommended to all managers as a reliable
 253 measure to rank their companies in terms of liquidity and short-term solvency. Thus, they
 254 refute a universal applicability of the desired ratios to all types of companies and this
 255 argument can be made for other components of WCM. This goes to support firm-specific
 256 study of components of WCM and profit relationships.

257

258 **3. METHODOLOGY**

259 **3.1 Model Specification**

260 Following Yeboah and Yeboah (2014), Agyemang and Asiedu (2013) and Addae and
 261 Nyarko-Baasi (2013), the model offered below was applied for the analysis in the study;

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

266 $ROA_t = f(CATA_t, CLTA_t, DR_t, SIZE_t) \dots \dots \dots 1$

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

269 $\ln ROA_t = \beta_0 + \beta_1 \ln CATA_t + \beta_2 \ln CLTA_t + \beta_3 \ln DR_t + \beta_4 \ln SIZE_t + v_t \dots \dots \dots 2$

270 Where,

271 $\ln\text{CATA}_t = \log$ of current assets to total assets in time t ,

272 $\ln\text{CLTA}_t = \log$ of current liabilities to total assets in time t ,

273 $\ln\text{DR}_t = \log$ of debt ratio in time t ,

274 $\text{SIZE}_t =$ Size of Global Haulage company limited in time t ,

275 $v =$ error term

276 $\beta_i =$ parameter $I = 0, 1, 2, 3, 4$

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

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

285

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

290 Also, when debt ratio is low, it implies the company is financially sound and is able to rely
291 on its internal funds. Such companies can therefore increase their profitability; hence the

292 coefficient of debt ratio is expected to be negative. In other words, $\beta_1 < 0$, $\beta_2 > 0$, $\beta_3 < 0$ and
293 $\beta_4 > 0$.

294 To estimate equation 2, instead of cross-sectional data or panel data, the study employs time
295 series techniques for the reason that advances in time series theories have rendered time
296 series estimates more advantageous over the use of cross section estimates (Jansen and Bruce,
297 1992). According to Bandiera and Natraj (2013), cross-country regressions cannot provide
298 causal evidence because cross-country differences in respective variables may be as a result
299 of cross-country variation in growth of an economy or development level. This is because,
300 the means of development is linked to changes in relative prices (Munshi and Rosenzweig,
301 2006) and also to technological advancement which influences firms operations and hence
302 profitability could be a consequent of the process of development. Fernandez (2010) also
303 argues that legal rights concerning wages among others could lead to biasness due to country
304 differences and development levels. Consequently, the study followed the “footsteps” of
305 Srinivasan and Bhagwati (1999) by employing more in-depth firm-specific times series
306 analysis.

307 **3.2 Data Type and Source**

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

313

314 **3.3 Definition of Variables**

315 *Profitability (Return on Assets [ROA])*

316 To analyse the impact of components of working capital on profitability of Global Haulage
 317 Company Limited, Return on Assets (ROA) is used as a proxy for profitability. Profitability
 318 can be represented by ROA, return on equity, net operating profit, gross operating profit
 319 margin among others. The ROA was chosen as the dependent variable in this study because it
 320 relates the profitability of the firm to its asset base hence it is seen as a better measure
 321 (Baveld, 2012; Makori and Jagongo, 2013)

322 It was measured as;

323
$$ROA = \frac{Net\ Profit\ after\ Tax}{Total\ Assets} \dots\dots\dots 3$$

324 ***Current Asset to Total Asset (CATA)***

325 The ratio of current asset to total assets measures a firm's degree of conservativeness in
 326 working capital investment policy such that a low figure imply that, the firm is conservative
 327 in working capital.

328 It is computed as;

329
$$CATA = \frac{Current\ Assets}{Total\ Assets} \dots\dots\dots 4$$

330 ***Current Liabilities to Total Asset (CLTA)***

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

334 It is represented as;

335
$$CLTA = \frac{Current\ Liabilities}{Total\ Assets} \dots\dots\dots 5$$

336 **Size of the Firm**

337 Size of a firm can either be calculated as the natural log of sales or the natural log of total
338 assets. Both exist in working capital literature (Sharma and Kumar, 2011; Karaduman et al.,
339 2011). However, the study utilise the natural log of total assets as the measure for size of
340 firm. It is computed as;

341 $SIZE = \ln(Total\ Assets)$6

342 **Debt Ratio (DR)**

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

346 $DR = \frac{Total\ Debt}{Total\ Assets}$7

347 **3.4 Estimation Technique**

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

353 **3.4.1 Exploratory Data Analysis**

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

358 **3.4.2 The Test for Unit Root**

359 There exist unit root in most time series data making it a requirement to first test for the
360 existence of unit root in the dataset before estimating coefficients of the model when using
361 time series data. This test also helps determine the order of integration of each of the
362 variables used. A stochastic process is considered to have no unit root if its expected value
363 and variance are constant overtime. If one or more of these conditions are not met then the
364 process is said to have unit root or non-stationary (Enyaah, 2011).

365 In such a situation, it is imperative to perform such test in other to find the exact estimated
366 values. The Dickey-Fuller Test (DF) was used to check the stationarity following Dickey and
367 Fuller (1981). The objective of this unit root test is to check whether or not the variables of
368 interest are integrated of order one i.e. $I(1)$ or order zero $I(0)$ before proceeding to estimate
369 the coefficients of the model in order to avoid bogus regression results.

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

371
$$\Delta y = b_0 + b_1 y_{t-1} + \sum_{n=1}^n (B_i \Delta y_{t-i}) + u_t \dots\dots\dots 8$$

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

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

379 $H_0: b_1=0$

380 $H_1: b_1 \neq 0$

381 **3.4 Co-integration**

382 When all the time series data for unit root are checked and is established to be integrated,
383 then the study will proceed to test for co-integration among the variables of interest. The
384 variables can be tested by either applying the Engle Granger (1987) estimation method or the
385 Johansen- Juselius estimation method (Johansen, 1988; Johansen and Juselius, 1990) to
386 defeat the problem of spurious correlation and misleading inferences. However, the Engle
387 Granger estimation method and the Johansen- Juselius estimation method are rendered
388 inappropriate when the variables are integrated of different orders. The Autoregressive
389 Distributed lag (ARDL) bounds test is appropriate in such a situation. The co-integration test
390 will help to determine whether a group of non-stationary series is co-integrated or not. If the
391 variables are co-integrated, the relationship may be taken to mean a long run relationship.
392 Therefore, in this study the ARDL bounds test method was used.

393 **3.5 The ARDL Co-integration Test**

394 This study employs the autoregressive distributed lag (ARDL) technique to test for the long-
395 run and short-run impact of components of working capital management on profitability in
396 Global Haulage Company Limited. The ARDL model is employed for this study because; the
397 ARDL model is a highly significant approach to find the co-integration even with small
398 sample size. Also, the ARDL approach does not need all of the variables to be integrated of
399 the same order unlike other co-integration techniques which requires that; the ARDL
400 technique can be applied whether the variables are $I(1)$ and/or $I(0)$. In effect, the ARDL
401 technique avoids the pre-testing problems connected to standard co-integration, which
402 demands that the variables be already categorised into $I(1)$ or $I(0)$ (Pesaran et al, 2001). This
403 model is even the more appropriate model for empirical work in a case where the stationarity
404 properties of the data are uncertain. Bahmani-Oskooee et al. (2004) observe that, in
405 ascertaining the order of integration of each variable in the model, the result may differ

406 depending on which test one uses hence the results could contradict. For instance, when one
 407 apply the Augmented Dickey Fuller and the Phillips-Perron tests for unit root, it is easy to
 408 wrongly conclude that there is nonstationarity when there is actually stationarity around a
 409 one-time structural break. The ARDL approach is therefore the best for this study because it
 410 avoids these problems.

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

$$415 \Delta \ln R_t = \alpha_0 + \sum_{i=1}^p a_i \Delta \ln CATA_{t-i} + \sum_{i=0}^p b_i \Delta \ln CLTA_{t-i} + \sum_{i=0}^p c_i \Delta \ln DR_{t-i} + \sum_{i=0}^p d_i \Delta SIZE_{t-i} + \delta_1 \ln R_{t-1} + \delta_2 \ln CATA_{t-1} +$$

$$416 \delta_3 \ln CLTA_{t-1} + \delta_4 \ln DR_{t-1} + \delta_5 SIZE_{t-1} + v_t, \dots \dots \dots 9$$

417
 418 Where all the variables are as defined earlier and Δ is the first difference operator. The
 419 parameters a, b, c, d, e, f, j denote the short run dynamics of model 9 to be estimated through
 420 the error correction framework and δ_i are the long run multipliers in the ARDL model with α
 421 as constant and v as disturbance term.

422 The ARDL framework is carried out in three stages (Pesaran et al., 2001). First, the presence
 423 of co-integration predicted by the theory is tested using an F-test. The F statistic tests for the
 424 joint significance of all the lagged levels variables (coefficient of the long run effect). The
 425 null hypothesis of no co-integration among the variables of interest is tested against the
 426 alternative hypothesis as stated below;

427 $H_0: \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = 0$

428 $H_1: \text{Not all the } \delta_s \text{ is zero}$

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

435 **3.6 Diagnostic and Stability Tests**

436 In every research work, the results should be reliable for policy implementation. Hence
437 diagnostic tests are done to examine the reliability of the results of the study. The study tested
438 for the significance of the variables and other diagnostic tests such as serial correlation,
439 functional form, normality; heteroscedasticity and structural stability of the model were
440 carried out.

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

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

457 Following Pesaran et al.(2001), the stability of the regression coefficients is evaluated by the
458 Ramsey RESET Test for stability and they can show whether or not the regression equation
459 is stable over time. This stability test is appropriate in time series data, especially when we
460 are uncertain about when structural change might have taken place.

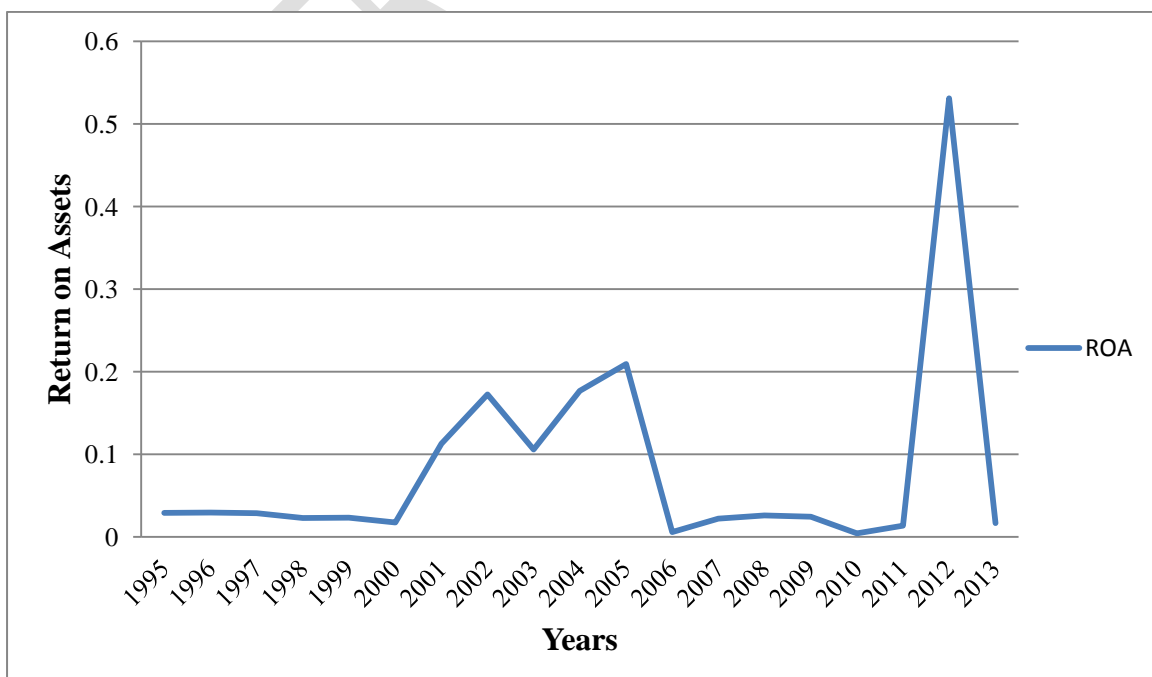
461

462 4. EMPIRICAL RESULTS AND DISCUSSION

463 4.1 Trend Analysis of Profitability (ROA)

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

468 **Fig 1: Trend Analysis of Profitability (ROA)**



469
470

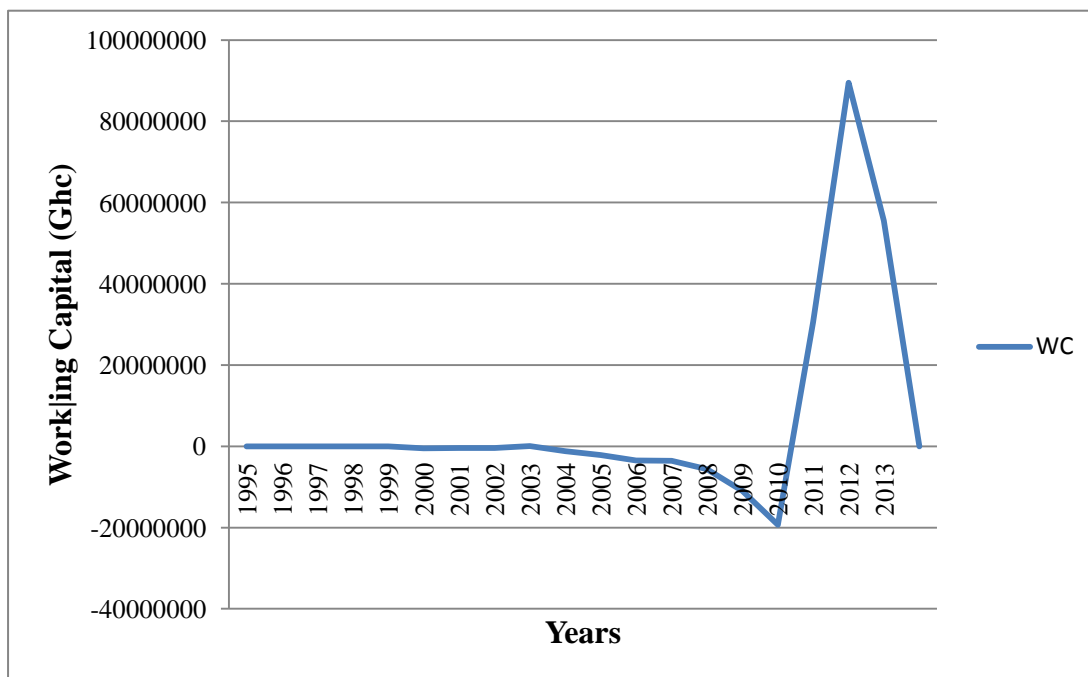
Source: Global Haulage Company Limited Annual Financial Statements

471 From Fig 1, ROA started with a negative trend from 1995 moving downwards until the year
472 2000 where it started picking up, increasing steadily to 2002 where ROA recorded a figure of
473 0.172447. From there, it drop again in 2003 and began to rise again. The negative trend or
474 low ROA could be as a result of poor management practices and also, the implementation of
475 the structural adjustment programme in 1993 where exchange rate liberalization, tightening
476 of monetary policy, foreign trade reforms, financial sector reforms and price deregulation
477 were adopted might have had a toll on companies in Ghana including Global Haulage
478 Company. ROA continued to rise from 2003 to 2005 and fell abruptly from 0.209 in 2005 to
479 0.006 in 2006. From 2006, ROA maintained a low figure but increased and had a constant
480 trend until it fell to its lowest point in 2010 at 0.004 over the study period. The high taxes to
481 make up for the over spending in 2004 due to the elections coupled with the revaluation of
482 the Ghanaian cedi in 2007 may have made things difficult for the management hence the fall
483 in ROA from 2004 to 2010. ROA began to rise a bit from 2010 and suddenly jumped to its
484 highest peak over the study period in 2012 to 0.531. ROA had a negative trend from 2012 to
485 2013. Generally, ROA had a low and stable trend for most of the years in the study.

486 **4.2 Trend Analysis of Working Capital**

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

493 **Fig 2: Trend Analysis of Working capital**



494 Source: Global Haulage Company Limited Annual Financial Statement
495

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

503 **4.3 Results and Analysis of the Unit Root Test**

504 The unit root test was conducted by applying the Dickey Fuller (DF). Table 3 shows the
505 results of the DF unit root test at levels and at first difference. The DF test employed included
506 a constant only for both tests. From the table, the null hypothesis were rejected for the
507 variables; log of return on assets (LNROA), log of current liabilities (LNCLTA) (both at 5%
508 significance levels), log of debt ratio (LNDR) (at 1% significance levels), and log of current

509 assets to total assets ratio (LNCATA) (at the 10% significance levels) in their levels which
 510 imply they achieved stationarity at their levels, whilst only firm size (SIZE) was stationary at
 511 first difference at 1% significance levels. Therefore, not all the underlying series in the
 512 present study are integrated of order one [i.e. $I(1)$] and there is no $I(2)$ variable hence the
 513 reason for applying ARDL model.

514 **Table 3: 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*

515 **4.4 Results and Analysis of the Co-integration Test**

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

521 From Table 4, the F- statistic (4.734) is more than the 5% upper critical value bound.
 522 Therefore, the null hypothesis is rejected implying that there is co-integration between the
 523 components of working capital management and the company's profitability. Having
 524 established the co-integration among the variables, the ARDL method is applied in the
 525 estimation of the parameters of the equation 3.4 in chapter three.

526 **Table 4: 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

527

528 **4.5 Results and Analysis of the Long Run Relationship**

529 The equation 9 was estimated for Global Haulage Company Limited using annual data from
530 1995-2013 using the ARDL estimation technique. The results are based on the Akaike
531 Information Criterion (AIC) using a maximum lag of one for equation 9. The results of the
532 long-run estimates are presented in Table .

533 From Table 5, only one variable is statistically significant in the long run and only one
534 variable did not meet its expected theoretical signs. Whilst log of current liabilities to total
535 assets ratio (LNCLTA), log of current assets to total assets (LNCATA), log of debt ratio
536 (LNDR) meet their theoretical signs, firm size (SIZE) did not meet its theoretical sign. Also,
537 whilst LNCATA, SIZE, LNDR is not statistically significant, LNCLTA is statistically
538 significant.

539 **Table 5: 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

540

541 The coefficient of LNDR is -3.054 are interpreted as, a 1% increase in debt ratio will lead to
 542 3.054% decrease in return on assets which represents profitability. This means that ROA is
 543 elastic with respect to debt ratio. However, this coefficient is statistically not significant.
 544 Return on assets is elastic with respect to current liabilities to total assets ratio with a
 545 coefficient of 3.483. This means that, when current liabilities to total assets ratio increases by
 546 a percentage unit, return on assets respond by increasing more by 3.48%. This result meet
 547 what theory says in terms of the sign and it is statistically significant at 5% significant level.
 548 Higher current liability to total asset ratio imply lower investments in working capital
 549 accounts through lower levels of investment in inventories, shortening trade credit to
 550 customers and postponing payments to suppliers and that results in an increase in
 551 profitability.
 552 Though current assets to total assets ratio meet the theoretical sign, it is not significant. The
 553 coefficient -0.155 means that, a one unit increase in CATA will cause ROA to decrease by
 554 0.155.

555 **4.6 Results and Analysis of the Short Run Dynamic Model**

556 The next step is to investigate the short run dynamics within the ARDL framework having
 557 estimated the long run co-integration model. Thus all the values of the variables at
 558 level lagged is retained in the ARDL model. Estimation results based on the Akaike
 559 Information Criterion are presented in the table below.

560 Basically, the Error Correction Model (ECM) reconciles the short-run behaviour of the
 561 variables with their long-run behaviour. The coefficient of ECM indicates the speed of

562 convergence to reestablish equilibrium in the dynamic model. The ECM coefficient presents
 563 how quick variables can return to stability and it is expected to be significant with a negative
 564 sign. Table 6 shows the expected negative sign of ECM is highly significant. This confirms
 565 the existence of the co-integration relationship among the variables in the model yet again.
 566 The coefficient of ECM_{t-1} of -0.557 implies that the deviation from the long-term return on
 567 assets equilibrium is corrected by 55.70% by the coming year.

568 **Table 6: Estimated Short Run Error Correction Model using the ARDL Estimation**
 569 **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*

570
 571 The short run results maintained the results in the long run in terms of the sign and the
 572 elasticity status of the variables. In the short run, except log of current assets to total assets
 573 ratio (LNCATA), all the variables such as log of debt ratio (LNDR), log of current liabilities
 574 to total assets ratio (LNCLTA) and firm size (SIZE) are statistically significant in the model.
 575 Whilst LNDR and LNCLTA are elastic, LNCATA and SIZE are inelastic as shown in Table
 576 6.

577 Debt ratio is statistically significant at 1% significance level and its coefficient -2.32 implies
578 that, a percentage unit increase in debt ratio will lead to a 2.32% decrease in return on assets.
579 This result conforms to the findings of Bagchi and Khamrui (2012), Gomes (2013) and
580 Makori and Jagongo (2013).

581 LNCLTA has a coefficient of 3.053 which means that, a 1% increase in LNCLTA will lead to
582 a 3.05% increase in LNROA in the short run similar to the result in the long run. LNCLTA is
583 also statistically significant at 1% significance level. Omesa, Maniagi, Musiega and Makori
584 (2013) also had similar findings in their work.

585 Current assets to total assets ratio remain to be negatively related to return on assets and
586 statistically not significant in the short run. The coefficient -0.085 is interpreted as, a unit
587 increase in LNCATA will result in a 0.085 decrease in LNROA. Finally, firm size
588 surprisingly is negatively related to the firm's profitability, contrary to a priori expectation
589 and was statistically significant at 1% significance level. The coefficient -0.822 implies that,
590 when firm size increase by a unit, LNROA falls by 0.822. This might be as a result of
591 diseconomies of scale due to managerial inefficiency arising from expansion of the firms
592 operations and branches. Also, it could be that managers expand firm size to achieve their
593 own parochial interest such as benefits associated with a larger firm since they will receive
594 higher remuneration when the firm increases in size. The findings is consistent with Goddard
595 et al. (2005) and Yeboah and Yeboah (2014) but contradicts the findings of Zawaira and
596 Mutenheri (2014).

597 **4.7 Model Diagnostics and Goodness of Fit**

598 The coefficient of determination (Adjusted R-Squared) shows that, about 76.37% of the
599 variations in return on assets are explained by the predictors which include current liabilities
600 to total assets ratio, current assets to total assets ratio, firm size and debt ratio. The F-statistic

601 is also statistically significant at 1% significance level which means that all the predictors
 602 jointly determines the level of return on assets in Global Haulage Company Limited.

603 The model passed all the diagnostic tests including the serial correlation test, the
 604 heteroscedasticity test, normality test and correct functional form test as presented on the
 605 table below. The diagnostic tests in the regression model are presented in Table 7. Based on
 606 these probability statistics from the regression, the model is good for analysis and policy
 607 interpretation.

608 **Table 7: Model Diagnostics and Goodness of Fit**

<i>Model Criteria/Goodness of Fit</i>	
R-Squared	0.875
R-Bar-Squared	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 Squares	9.237
Equation Log-likelihood	-19.537
DW-statistic	2.436

<i>Diagnostics</i>	<i>Test Statistic</i>
$\chi^2_{Auto} (3)$	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.

609 **5.Discussion of findings**

610 The study indicated that debt ratio is negatively related to profitability, showing that Global
 611 Haulage Company Limited debt ratio is less profitable. Since high debt ratio adversely impact
 612 on profitability, management should use less of debt in financing their activities to be able to
 613 increase profit. This result conforms to the findings of Bagchi and Khamrui (2012), Gomes
 614 (2013) and Makori and Jagongo (2013). Makori and Jagongo (2013) alsofound the existence
 615 of negative correlation between Return on Assets and the firms average collection period and

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

620 Also, the study revealed that there is a significant relationship between current liability to
621 total assets ratio on profitability. This accounted through lower levels of investment in
622 inventories, shortening trade credit to customers and postponed payments to suppliers and
623 that results in an increase in profitability. By implication, aggressive working capital policy
624 which lowers investments in working capital thereby increasing current liability to total asset
625 ratio is appropriate if management's goal is to increase profit. Hence aggressive working
626 capital policies should be pursued cautiously since it also poses risk to the company. The
627 conservative working capital policy as described by Ajibolade and Sankay (2013) and Agyei
628 and Yeboah (2011) showed that higher levels of inventories, larger quantity of current assets
629 in relation to total assets extends more trade credit to customers and reduce supplier's
630 financing which results in a lower profitability and lower risk. Petersen and Rajan (1997) as
631 cited in Gomes (2013) opined that a reduction of supply costs reduces both the risk of price
632 fluctuation among business cycles and the risk of losing customers as a result of product
633 scarcity. When more trade credit is extended to customers, conservative working capital
634 policies may increase profitability because extend trade credit ensure that the contracted
635 services have been carried out, making way for customers to check if purchased products and
636 services are as agreed in quality and quantity terms prior to payment, leading to repeated
637 sales (Gomes, 2013). It also reduces asymmetric information between buyer and seller
638 (Smith, 1987 in Gomes, 2013), thereby strengthening the long-term supplier-customer
639 relationships, increasing sales in periods of low demand and reduces transaction costs
640 (Gomes, 2013). The reduction on supplier's financing allows customers to capitalise on

641 prompt payment discounts due to early payments and reduction of the costs of external
642 financing (Gomes, 2013). The findings of this study is in agreement with Dong and Su
643 (2010). Dong and Su (2010) indicated a positive and significant relationship between
644 payables deferral period and firm profitability. Such findings were also supported by
645 Mathuva (2010) in Kenya, Falope and Ajilore (2009) in Nigeria, Gill et al (2010) and Akoto
646 et al. (2013) in Ghana.

647 The significant negative relationship between firm size and firm profitability suggest that the
648 firm is experiencing diseconomies of scale due to managerial inefficiency arising from
649 expansion of the firms operations and branches or managers expand the firm size to achieve
650 their own parochial interest such as benefits associated with a larger firm and therefore will
651 do whatever it takes regardless of some warning signs. The findings is consistent with
652 Goddard et al. (2005) and Yeboah and Yeboah (2014) but contradicts the findings of Zawaira
653 and Mutenheri (2014). Therefore, policy makers should therefore put in place measures to
654 check these managerial inefficiencies and self-interest of managers to improve the
655 profitability of the firm.

656 **5.2 Conclusion**

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

665 and effective working capital management policies and practices for better performance of
666 their company.

667 **5.3 Limitation and Areas for Further Research**

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

674 Although the objectives of the study were achieved, the study applied few proxy variables for
675 components of working capital management which may be bias estimators of the unobserved
676 variables. For instance, components such as ratio of current assets to total assets, current
677 liability to total assets ratio were used in contrast to studies that used several proxy variables
678 including current ratio, average collection period, inventory turnover.

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

682 **Competing Interests disclaimer**

683 Authors have declared that no competing interests exist. The products used for this research
684 are commonly and predominantly use products in our area of research and country. There is
685 absolutely no conflict of interest between the authors and producers of the products because
686 we do not intend to use these products as an avenue for any litigation but for the advancement

687 of knowledge. Also, the research was not funded by the producing company rather it was
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