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**THE IMPACT OF WORKING CAPITAL ON THE PROFITABILITY OF FIRMS
LISTED ON THE DAR ES SALAAM STOCK EXCHANGE**

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Abstract

The study covered the period from 1st January 2005 to 31st December 2015. Seven (7) out of eight (8) companies listed on the Dar es Salaam Stock Exchange agreed to be part of this study. Companies from the financial and service sectors were excluded because their working capital did not fit the definition of working capital used in this paper. The data came from the audited financial reports submitted by those companies to the Dar es Salaam Stock Exchange. Descriptive statistics, multiple regression analysis and correlation analysis were used to analyze the dataset. Variance Inflation Factor and Durbin-Watson tests were used to control for any presence of autocorrelation between the independent variables. In this study, I found that net operating profit has a positive and significant relationship with the inventory conversion period. Net operating profit also has a positive relationship with the inventory conversion period. The results suggest that maintaining high level of stocks reduces the risk of product shortage, and protects the firm from disruption of the production process. There is a positive and significant relationship between net operating profit and net trade cycle. This means net operating profit increases with the increase in overall number of days taken by the firm from the purchasing of stock to the collection of cash from the sales of finished goods. This finding is consistent with previous work that suggests that the cash conversion cycle and the net trade cycle have a positive relationship with firm profitability. In general, the findings suggest that managers can increase the value of equity holders by increasing the time lag between the acquisition of material/stock and the actual receipt of cash from sales of finished goods, and, that managers should increase the number of days taken to sell off stock. Managers also need to maintain a low level of financial leverage to increase profitability. The negative relationship between profitability and financial leverage may be caused by slow generation of profit in early years where assets were bought using borrowed money that entailed high interest costs. Other variables, such as size of firm, age of firm, sales growth rate, GDP, and asset tangibility (ratio of fixed assets to total assets), also have significant impacts on the overall profitability of a firm.

Abbreviations used in the text

KEY WORDS	ABBREVIATION
Working Capital Management	WCM /WC
Cash Conversion Cycle	CCC
Net Trade Cycle	NTC
Average Collection Period	ACP
Inventory Conversion Period	ICP
Average Payment Period	APP
Net Operating Profit	NOP
Return on Asset	ROA
Return on Equity	ROE
Average Collection Period	ACP
Inventory Conversion Period	ICP
Average Payment Period	APP
Financial Leverage	FinLev
Asset Tangibility Ratio	AT
Company Size	CS
Gross Domestic Growth Rate	GDPgrow
Sales Growth Rate	SalesGrow
Prefix For ACP, ICP and APP in The Model	DOX
Age of A Firm	AGE
Industry Characteristics	Ind

1. Introduction

In recent years, companies and financial experts have recognized the significant impact of working capital management on the liquidity and profitability of the firm. Working capital management has developed to become a sensitive part of the healthy operation of the firm, because the profitability of the firm, in most cases, does not necessarily reflect its liquidity, and vice versa. According to a global survey on working capital management by Price Waterhouse Coopers in 2010, it is apparent that, after years of poor management of working capital, firms now realize the importance of managing their current capital, and understand the impact of working capital on day to day operations. Failure to manage working capital seriously impacts the ability of the firm to fund its daily operations, leading to over reliance on debt financing and poor returns on the funds invested by shareholders.

This report also found that the size and industrial classification of the firm affects the size of working capital managed by the firm. PwC (2010) also suggested that small enterprises have significantly higher net working capital (NWC) compared to large enterprises, and that consequently the size of the firm is vital when assessing the relationship between working capital and the profitability of the firm. In this study, financial leverage and size of the firm have been included as control variables in the regression model. Thus, industry sector and the view point of management on the importance of creating free cash flows rather than turning to creditors, affect the size of working capital and the direct effect of this factor on the profitability of the company.

Firms may choose to rent or lease fixed assets but cannot escape investment in current assets. A firm can also thrive without making profits but cannot operate without having working capital. Working capital is the funds available for the day to day operation of a business. Working capital (WC) is calculated as current assets minus current liabilities. The management of WC impacts the value, liquidity and the profitability of the firm (Smith 1980, 549-562). In this regard, the existence of

the company depends on how well it manages its working capital. Management of working capital refers to planning and controlling the level or threshold of current assets and current liabilities to avoid the risk of failure to cover short term obligations, and at the same time to avoid locking up cash in assets (Eljelly 2004,48-54). To achieve efficient management of working capital, managers need speed up collections from sales and delay settlement of credit purchases (Nobanee and AlHajjar 2009, 488-495). In general, the management of working capital involves monitoring of the Cash Conversion Cycle and the Net Trade Cycle of the firm.

Management of working capital ensures that a company achieves the desired level of current assets and current liabilities to minimize risk and maximize profitability (Ricci and Vito, 2006,69-80). Working capital management is a vital function in the overall corporate efforts to increase shareholder value (Shin and Soenen 1998, 38-42). In this study profitability is referred to as the net operating profit margin, the return on assets, and the return on equity. Consistent with (Deloof 2003, 573-587), net operating profit margin is measured as sales-cash cost of sales (cash operating expenses). Non-cash items that do not involve cash flows, such as depreciation and amortization, are ignored in these computations (Mathuva 2010, 3-10; Arshad and Gondal, 2013, 384-389).

In this paper, working capital management efficiency is measured by the cash conversion cycle and the net trade cycle. The Cash Conversion Cycle (CCC) is the number of days from when the payment for purchased stock is made to the time the cash is collected from sales (Besley and Brigham, 2005). The cash conversion cycle is computed by summing up account receivable period and inventory conversion period entries and then deducting the average payment period. In this study the impact of the three components of CCC (ACP, ICP, and APP) on profitability was also analyzed. The average collection period (ACP) is the time before credit sales are due. The average collection period represents the companies' collection policy. The inventory conversion period is the time that lapses before selling off the inventory.

Average payment period is the time taken by the firm from receipt of supplies or goods or materials to pay credit suppliers. ACP, ICP and APP were used as independent variables consistent with other studies (Deloof 2003, 573-587; Lazaridis and Tryfonidis 2006, 26-35), and (Garcia, Teruel and Martinze- Solano 2007, 164-177).

.The relationship among the components of working capital is depicted in Figure 1.

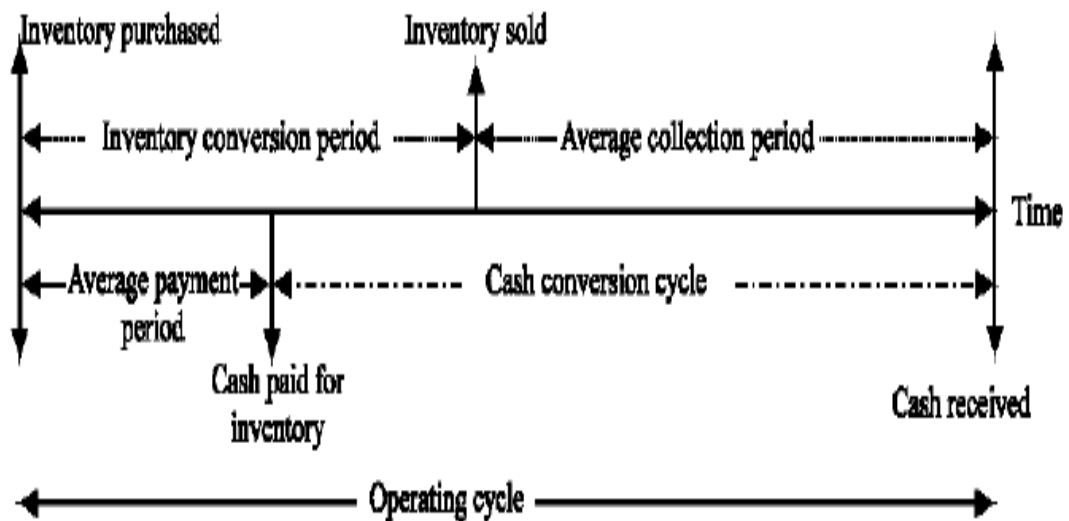


Figure 1: Operating and Cash Conversion Cycles

Source: Ross et al (2003).

The Net trade cycle (NTC) uses the same components as the cash conversion cycle (CCC), the only difference is that NTC express all components in terms of sales.

2. Literature review

Different researchers have explored the relationship between the management of working capital and the components of the firm's financial performance and operational efficiency. The study by Banos-Caballeros, Garcia-Teruel and Martinez-Solano in Spain found that management of working capital indeed affects the profitability of firms in Spain. The findings suggest managers can increase the value of the firm by reducing the level of inventories and the time account receivables outstanding. Moreover, cash conversion cycle has a negative relationship with the firm's profitability (Banos-Caballeros, Garcia-Teruel and Martinez-Solano 2007, 164-170). Other researchers also present interesting findings.

In a study done on listed firms in Spain, Deloof found that net gross profit has a negative relationship with the average collection period, inventory conversion cycle, average payment period, and the cash conversion cycle (Deloof, 2003,580-585). A study done by Mathuva on the firms listed on the Kenya Stock exchange found a negative relationship between NOP and average collection period. Mathuva also found that net operating profit has positive relationship with inventory conversion period and average payment period (Mathuva, 2010, 1-11). Managers can enhance a firm's profitability by minimizing the average collection period (Deloof 2003, 585; Mathuva 2010, 1-11). (Falope and Ajilore 2009, 73-84) found that the average payment period (APP) has a negative relationship with profitability. Nobanee and AlHajjar suggest that minimizing day accounts receivable outstanding (average collection period) may reduce the profitability of the firm by chasing away good credit customers. On the other hand, delaying payment to creditors enables the firm to have more cash that can be invested in revenue generating activities. However, too much delay may damage a firm's creditworthiness, and creditors may hesitate to transact with the company. This situation could be detrimental to firm operations and consequently reduce profitability (Nobanee and AlHajjar 2009, 488-495). Smith

also believed that decisions which maximize profitability do not necessarily maximize liquidity (Smith 1980,549-562). A shorter CCC ought to improve profitability and vice versa (Deloof 2003, 573-587; Nobanee and AlHajjar 2009, 488-495; Mathuva 2010, 1-11).

The research done by Jayarathne on 20 firms listed on the Colombo stock exchange revealed that return on assets has a negative relationship with the average collection period, and the inventory conversion period. However, return on assets has a positive relationship with accounts payable (Jayarathne 2014, 269–274). In turn, trade credits give an incentive to customers to buy goods when there is low demand and therefore increase sales (Emery1987, 271-83). Thus, a relaxed credit policy will help customers to evaluate the quality of or use of the product before payment (Long 1993,117-125). This may motivate customers to buy and hence increase sales.

Relaxed trade credit policy can be used to attract new customers as suggested by (Petersen and Rajan 1997, 661-691). Keeping a high level of stock may also protect the firm from bull effects and shortage of products.(Mathuva 2010,1-11) on the other hand, argues that high investment in inventories ties up funds that could be used in other activities that generate revenue such as interest-bearing deposits. NTC is strongly and negatively related to ROA (Shin and Soenen, 1998,37-45). Another study by (Oz and Gungor 2007,47-54) on the impact of WCM as measured by the impact of NTC and other components of working capital on the gross profits of 68 manufacturing firms listed on the Irish Stock Exchange (ISE) from 1992 to 2005, found profitability is negatively related to NTC, the average collection period, the inventory conversion period, and the average payment period. (Karadagali 2012,36-44) investigated a sample of Turkish listed companies from 2002 to 2010, and the findings suggest that the cash conversion cycle and the net trade cycle have a positive relationship with operating income and return on stock for Small and Medium Enterprises (SMEs), but for bigger companies, the cash conversion cycle

and the net trade cycle are negatively related to profitability.(Wang 2002,159-179) studied Japanese and Taiwanese companies, finding that CCC is negatively related to Return on Assets and Return on Equity. Wang believes that strong liquidity management will increase profitability and the value of the company. However, (Uyar 2009, 186-193) found a negative relationship between CCC and return on assets, and no relationship between CCC and Return on Equity, suggesting that shorter CCC times increase profitability while longer CCC times decrease profitability.

3. Statement of the Research Problem

The relationship between working capital and its components with the profitability of a company is still a grey area for research. (Shin and Soenen 1998, 37-45) and (Deloof 2003, 573-587) suggest a negative relationship between CCC, ACP, ICP, APP, and firm profitability. However, there is still a contradiction as to the findings on the individual components of CCC. Banos-Caballeros, Garcia-Teruel and Martinez-Solano suggest that there is no relationship between average payment period and profitability (Banos-Caballeros, Garcia-Teruel and Martinez-Solano 2007, 164-170). For NTC, the empirical evidence is relatively much more limited. However, the findings of (Shin and Soenen 1998, 38-42) suggest that NTC is strongly and negatively related to return on assets. (Oz and Gungor 2007, 47-54) suggests profitability is negatively related to all components of working capital management. Similarly, the study done by (Karadagil 2012, 36-44) investigated a sample of Turkish listed companies from 2002 to 2010, and found that the cash conversion cycle and the net trade cycle have positive relationships with operating income and the stock market return for SMEs, however, for large firms, CCC and NTC negatively relate with profitability. This unclear relationship between working capital and profitability makes this topic interesting (Nazir and Afza 2007,11-21). The PWC global working capital survey 2015 explained that this unclear relationship is because of, among other factors, country differences, industry differences, industry seasonality, production life cycle, credit policy, competition level in the market and the timing of research all play a part in its construction.

In this regard, this paper sought to study whether there is any relationship whatsoever between working capital and profitability for the companies listed on the Dar es Salaam stock exchange (DSE). The aims of the study are as follows:

1. To establish the relationships between the average collection period (ACP) and firm profitability;

2. To assess whether there is a significant relationship between the average payment period and firm profitability;
3. To determine whether any significant relationship exists between the inventory conversation period and firm profitability;
4. To determine if there is a significant relationship between the Cash Conversion Cycle (CCC) and firm profitability; and
5. Determine if the net trade cycle (NTC) can be a substitute for the CCC.

4. The Significance of the Study

The importance of this study is found in the need to assess the relationship of CCC and its components with the profitability of firms listed on the Dar es Salaam Stock Exchange (DSE). Satisfactory completion of the study will enable the researcher to suggest which components firms must pay more attention to in relation to increasing their profitability.

5. Conceptual Framework and Research Hypotheses

5.1 Conceptual Framework for the Study

Figure 2 depicts the conceptual relationship between working capital management and firm profitability.

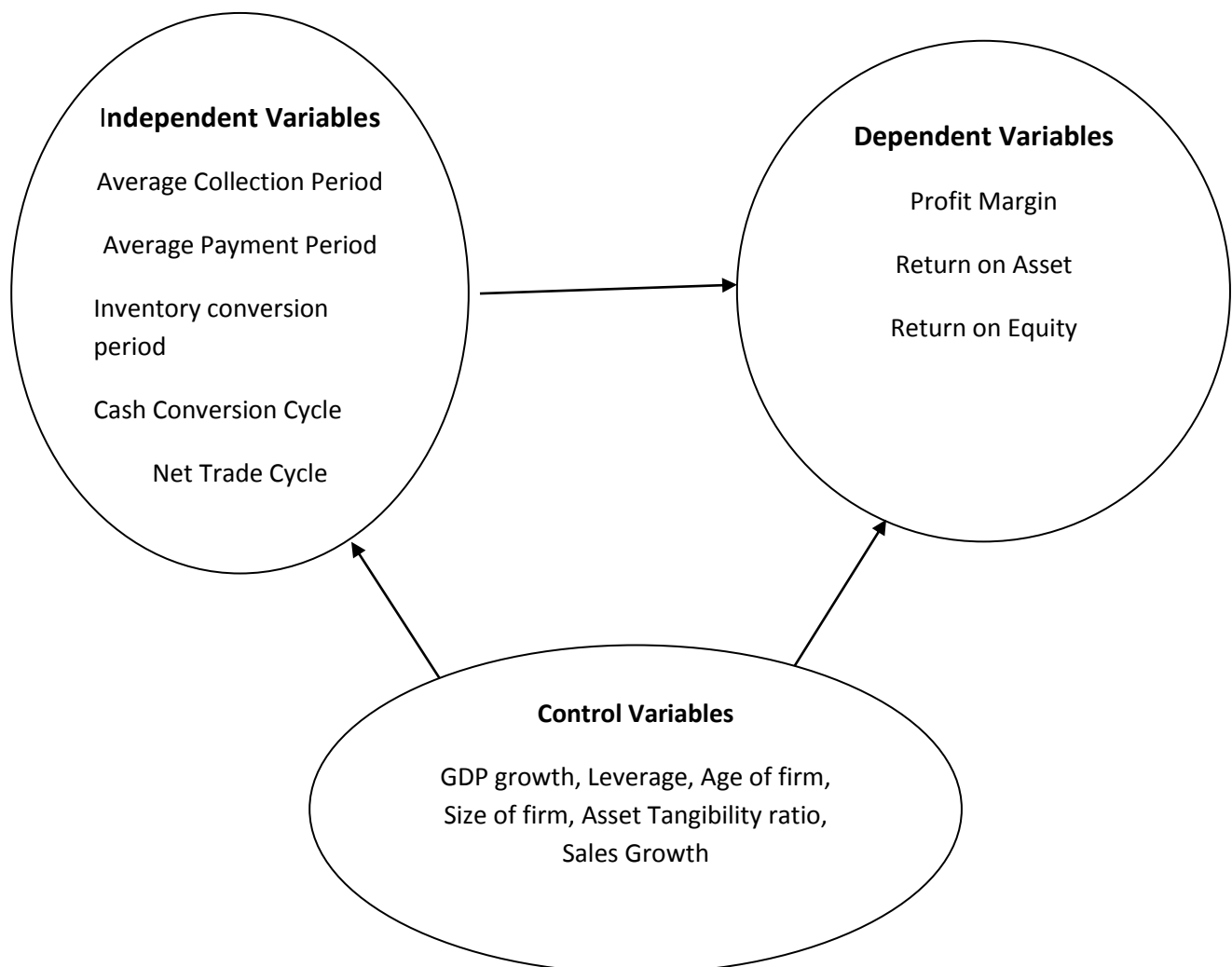


Figure 2: Components of the Conceptual Framework for this Study

5.2 Reasons for selecting Control Variables in the framework

The control variables were chosen because of the effects (Noise-effects) they exert on profitability, and hence may distort the relationship that exists between working capital management and the profitability of the firm. The impact of leverage, GDP growth rate, age of firm, size of firm, fixed assets, and sales growth have been extensively studied by other researchers (Mathuva 2010,1-11; Deloof 2003,573-587).

5.3 Research Hypotheses

Hypothesis, developed from the specific research objectives, are as follows.

1. Hypothesis 1: There is no significant relationship between the average collection period (ACP) and NOP, ROA, or ROE;
2. Hypothesis 2: There is no significant relationship between the average payment period and NOP, ROA, or ROE;
3. Hypothesis 3: There is no significant relationship between the inventory collection period and NOP, ROA, or ROE;
4. Hypothesis 4: There is no significant relationship between the cash conversion cycle and NOP, ROA, or ROE; and
5. Hypothesis 5: The NTC can act as a substitute for the CCC.

6. Data and Methodology

The aim of this research was to contribute toward the understanding of the position of working capital management in corporate finance. This section discusses the empirical analysis and statistical techniques used to assess the relationship between working capital and profitability.

6.1 Dataset

The panel data were obtained from the Dar es Salaam stock exchange (DSE), and covered the period from 2005 to 2015. The data was collected from this market because it is a reliable source: the reports submitted by firms to the DSE are subject to independent audit by international audit firms (Ernst Young, KPMG, PwC and Deloitte). Tanzania's gross domestic product growth rate was obtained from the world development indicator website. Consistent with (Deloof 2003,573-587), the firms in banking, insurance and service industries were omitted as they do not maintain inventory, and this violates the framework of the CCC, and the definition of working capital used in these omitted industries is different from the one under investigation in this study (Lazaridis and Tryfonindis, 2006,26-35).

18 firms are listed in the DSE, but only 8 met the definition of working capital under this study. Among eight (8) possible firms, one firm (Acacia) was omitted because the company was not listed on the DSE before 2010, and thus reliable data could not be found for the years before 2010; the scope of this study is from 2005 to 2015. Consequently, 7 firms out of the possible 8 were studied: the companies selected and analyzed include Tanga Cement, Tanzania Cigarette Company, Twiga Cement, Tanzania Packers Ltd, Tanzania Breweries Ltd, East African Breweries Ltd, Acacia Mining, and Tanzania Oryx Gas. The companies were selected from different industries: the Cement production Industry, the Cigarette industry, the Tea Making Industry, the Mining Industry, and the Natural Gas exploration industry. In accordance with previous studies (Deoof, 2003,573-587; Banos-Ceballos, Garcia- Teruel and Martinze- Solano 2007, 164-177; Shin and Soenen 1998, 38-42),

any possible anomalies with respect to negative values in total assets, current assets, fixed asset, equity, depreciation or interest paid that could affect the accuracy of findings were considered, but none were found.

The variables

The profitability measure numerator is operating profit. This is defined by sales minus the cash cost of goods sold and the cash operating expenses, which is consistent with (Deloof 2003,573-587). Depreciation, amortization and any other values that do not entail cash outflows/inflows were excluded from the computation. Consequently, in this study, profit measures include the net operating profit margin (NOP) that is measured by net operating profit/sales, the return on assets (ROA) is measured by net operating profit/total assets, and the return on equity (ROE) is measured by net operating profit/total equity. The profitability measures selected have been extensively studied by (Bonas et al., 2014, 332-338) and (Mathuva 2010,1-11). The cash conversion cycle and the net trade cycle were used as the main working capital measures for inclusion in the models. The cash conversion cycle is computed by adding the average collection period to inventory turnover in days, and then subtracting the average payment period. The average collection period, inventory conversion period, and the average payment period computation follows that of the Hackett Group working capital survey in the USA (2016). The average collection period (ACP) is computed as year-end trade receivable/one-day average revenue; the inventory conversion period (ICP) is computed as year-end inventory balance/ average day cost of goods sold, and the average payment period (APP) is computed as year-end accounts payable/average day cost of goods sold. Thus, the cash conversion cycle is computed as:

$$CCC = AR * 365 / \text{Sales} + \text{Inventory} * 365 / \text{COGS} - AP * 365 / \text{COGS}$$

Where: AR refers to the Year-end Accounts Receivable balance; AP year end refers to Account Payable balances; COGS refers to the Cost of Goods sold or the Year-end inventory balance.

The Cash Conversion Cycle formula combines the major components of a firm's liquidity and operating efficiency, hence CCC can be regarded as the best measure of working capital management efficiency. The Net Trade Cycle is also used with CCC (Shin and Soenen 1998, 38-42), and is as follows:

$$\text{Net Trade Cycle} = \text{AR} * 365 / \text{Sales} + \text{Inventory} * 365 / \text{Sales} - \text{AP} * 365 / \text{Sales}$$

NTC can be used as a function of projected sales growth to determine the additional working capital needed (Gill and Neil 2010,1-9). In this study both measures, CCC and NTC, are tested to determine if NTC can be a good substitute for CCC. The difference between NTC and CCC is that NTC measures all components of CCC as a percentage of sales.

The control variables used are financial leverage, size of firm, age of firm, GDP growth rate, asset tangibility ratio, sales growth rate (Mathuva 2010,1-11; Deloof 2003,573-587). The leverage ratio (financial debt ratio) denoted by FinLev is computed as total liabilities (current liabilities + long term liabilities)/total assets. The asset tangibility ratio denoted by AT is computed as fixed asset/total assets (Deloof 2003, 573-587). Consistent with (Deloof 2003, 573-587) sales growth rate as denoted by SalesGrow, is computed as (this year's sales - previous year's sales / previous year's sales). The effect of GDP growth rate is denoted by GDPGrow and was also taken into consideration as control variable. The GDPGrow data were obtained from World Development Indicators (WDI). The age of the firm denoted by AGE was obtained by taking a natural logarithm of the number of years the firm has existed since it started operations. Industry characteristics are denoted by Ind. The firm size denoted by CS is a natural logarithm of total turnover (sales), and is incorporated into the model as a control variable.

Candidate Companies:

Data from 7 out of the 8 possible candidate companies were collected and analyzed. Companies from services, banking and financial industries were excluded because the nature of their activities violates the definition of cash conversion cycle (CCC) in this study (Deloof 2003,573-587).

Data Analysis and Model specification

In each model, one profitability measure is regressed against one determinant variable (CCC, NTC, ACP, ICP, and APP), plus control variables (FinLev, Age, CS, SalesGrow, Ind, GDPGrow, and AT). This meant 15 regression models in total. Ordinary Least Square (OLS) regression was used to determine the effects of working capital on profitability. Tests using correlation, descriptive statistics, and multiple regressions were carried out. Variance Inflation Factor and Durbin-Watson tests were used to identify any presence of autocorrelation between the independent variables. The panel of data was analyzed using STATA statistical software. The impact of working capital on the profitability of firms was modeled in accordance with previous studies (Deloof 2003, 573-587; Mathuva 2010, 1-11). The regression model is represented in the following section.

6.3.1 Models

Model 1

$$\text{NOP} = \beta_0 + \beta_1 \text{CCCit} + \beta_2 \text{Lev} + \beta_3 \text{AT} + \beta_4 \text{CS} + \beta_5 \text{GDPgrow} + \beta_6 \text{AGE} + \beta_7 \text{SalesGrow} + \beta_8 \text{Ind} + \varepsilon_{it}$$

Model 2

$$\text{ROA} = \beta_0 + \beta_1 \text{CCCit} + \beta_2 \text{Lev} + \beta_3 \text{AT} + \beta_4 \text{CS} + \beta_5 \text{GDPgrow} + \beta_6 \text{AGE} + \beta_7 \text{SalesGrow} + \beta_8 \text{Ind} + \varepsilon_{it}$$

Model 3

$$\text{ROE} = \beta_0 + \beta_1 \text{CCCit} + \beta_2 \text{Lev} + \beta_3 \text{AT} + \beta_4 \text{CS} + \beta_5 \text{GDPgrow} + \beta_6 \text{AGE} + \beta_7 \text{SalesGrow} + \beta_8 \text{Ind} + \epsilon_{it}$$

Model 4

$$\text{NOP} = \beta_0 + \beta_1 \text{NTCit} + \beta_2 \text{Lev} + \beta_3 \text{AT} + \beta_4 \text{CS} + \beta_5 \text{GDPgrow} + \beta_6 \text{AGE} + \beta_7 \text{SalesGrow} + \beta_8 \text{Ind} + \epsilon_{it}$$

Model 5:

$$\text{ROA} = \beta_0 + \beta_1 \text{NTCit} + \beta_2 \text{Lev} + \beta_3 \text{AT} + \beta_4 \text{CS} + \beta_5 \text{GDPgrow} + \beta_6 \text{AGE} + \beta_7 \text{SalesGrow} + \beta_8 \text{Ind} + \epsilon_{it}$$

Model 6:

$$\text{ROE} = \beta_0 + \beta_1 \text{NTCit} + \beta_2 \text{Lev} + \beta_3 \text{AT} + \beta_4 \text{CS} + \beta_5 \text{GDPgrow} + \beta_6 \text{AGE} + \beta_7 \text{SalesGrow} + \beta_8 \text{Ind} + \epsilon_{it}$$

Testing of NTC and CCC may not be enough because they are the overall KPIs of all components such as the Average Collection Period (ACP), Days to sell inventory (ICP), and day accounts payable outstanding or paid (APP). Each of these components affects profitability differently, hence regression between individual components and profitability was carried out as a precautionary measure to determine their impact.

$$\text{NOP} = \beta_0 + \beta_1 \text{DOXit} + \beta_2 \text{Lev} + \beta_3 \text{AT} + \beta_4 \text{CS} + \beta_5 \text{GDPgrow} + \beta_6 \text{AGE} + \beta_7 \text{SalesGrow} + \beta_8 \text{Ind} + \epsilon_{it}$$

$$\text{ROA} = \beta_0 + \beta_1 \text{DOXit} + \beta_2 \text{Lev} + \beta_3 \text{AT} + \beta_4 \text{CS} + \beta_5 \text{GDPgrow} + \beta_6 \text{AGE} + \beta_7 \text{SalesGrow} + \beta_8 \text{Ind} + \epsilon_{it}$$

$$\text{ROE} = \beta_0 + \beta_1 \text{DOXit} + \beta_2 \text{Lev} + \beta_3 \text{AT} + \beta_4 \text{CS} + \beta_5 \text{GDPgrow} + \beta_6 \text{AGE} + \beta_7 \text{SalesGrow} + \beta_8 \text{Ind} + \varepsilon_{it}$$

7. Findings and Discussion

7.1 Descriptive statistics

Table 1 summarizes the statistics relating to the variables included in the regression models. Overall, the average (mean) net operating profit margin is 21.47%, while -7.98% and 40.21% are the minimum losses and maximum profits recorded by the firms respectively. The overall mean return on equity is 44.15% while the minimum and maximum ROE is -29.29% (loss) and 128.34% (profit) respectively. The minimum and the maximum average ROA are -6.58% and 56.95% respectively. Overall, the firms take 36.27 days to collect receivables. The quickest account receivable collection is 5 days while the maximum delay to collect receivables is 118.34 days (approximately 4 months). The fast and slow inventory conversion period is 22 days and 472 days (more than a year) respectively.

Overall, an average firm listed on the DSE takes 121 days (approximately 4 months) to pay its creditors. The quickest and slowest repayment of creditors is 42 days and 315 days respectively. Overall, the average cash conversion cycle of sampled firms is 41 days (more than one month). The overall average net trade cycle is 21 days while the minimum and maximum cash conversion cycle is -132 day and 198 days respectively. The table also shows that average firm size as measured by natural logarithm of total sales is 16 employees (all industries), 19 (cement), 16 (natural gas), 14 (Tea) and 12.3 (Brewing). On average, the firms in DSE have a financial leverage index (financed by loan) of 44.6, The typical firm has a average asset tangibility ratio of 64.7.

The mean gross domestic product growth rate of Tanzania from 2005 to 2015 was 6.7%. On average, the sales of all the sampled firms from DSE grew at the rate of 13.5%. The average age of the firms (as measured by the natural logarithm of years since inception) for all sampled firm is 3.5 years, while for individual industries natural gas firms are younger with average age of 2 years. In the other industries, the average age is 4 years (Cement), and 4.2 years (Brewing).

Table 1. Descriptive Statistics

Measure	N	Minimum	Maximum	Mean	Std. Deviation
NOP	77	-7.9827	40.2139	21.478580	12.3579351
ROE	77	-29.2996	128.3418	44.151980	29.0600181
ROA	77	-6.5830	56.9510	25.438559	16.1185978
ACP	77	5.1641	118.3433	36.274674	27.3624451
ICP	77	22.4847	472.2947	126.347056	78.4004251
APP	77	42.3109	315.0120	121.784596	56.9336987
CCC	77	-132.2686	197.7841	40.837134	64.5461396
NTC	77	-108.6484	119.7636	21.145686	27.6431945
FinLev	77	.1889	1.2421	.446025	.2143140
AT	77	.3314	1.5569	.646862	.1798706
GDPGrow	77	4.7000	8.5000	6.645455	1.2508466
CS	77	11.8200	19.4800	16.177403	2.4163856
Age	77	1.8000	4.5300	3.590519	.7597522
SalesGrow	77	-.5365	.6633	.135157	.1570354

Table 2: Pearson Correlation Analysis

	NOP	RROE	ROA	ACP	ICP	APP	CCC	NTC	FinLev	AT	GDPGrow	CS	AGE	SalesGrow
NOP	1	.685**	.834**	-.419**	.057	-.081	-.037	.203	-.567**	.057	-.115	.077	.600**	.291*
ROE	.685**	1	.745**	-.299**	.105	.116	-.101	.192	-.166	.144	-.119	-.224	.599**	.324**
ROA	.834**	.745**	1	-.607**	.236*	-.092	.111	.234*	-.635**	-.065	-.062	-.272*	.600**	.302**
ACP	-.419**	-.299**	-.607**	1	-.373**	.249*	-.249*	.044	.482**	.137	.069	.012	-.532**	-.035
ICP	.057	.105	.236*	-.373**	1	.403**	.702**	.462**	-.229*	-.535**	-.057	-.429**	.276*	-.034
APP	-.081	.116	-.092	.249*	.403**	1	-.287*	-.155	.142	-.137	-.079	-.347**	.180	-.025
CCC	-.037	-.101	.111	-.249*	.702**	-.287*	1	.716**	-.200	-.471**	.030	-.211	-.049	-.034
NTC	.203	.192	.234*	.044	.462**	-.155	.716**	1	-.173	-.256*	.117	-.202	.125	.146
FinLev	-.567**	-.166	-.635**	.482**	-.229*	.142	-.200	-.173	1	.252*	.012	.034	-.250*	-.077
AT	.057	.144	-.065	.137	-.535**	-.137	-.471**	-.256*	.252*	1	-.175	.025	-.046	.066
GDPGrow	-.115	-.119	-.062	.069	-.057	-.079	.030	.117	.012	-.175	1	.004	.000	.037
CS	.077	-.224	-.272*	.012	-.429**	-.347**	-.211	-.202	.034	.025	.004	1	-.105	-.004
AGE	.600**	.599**	.600**	-.532**	.276*	.180	-.049	.125	-.250*	-.046	.000	-.105	1	.060
SalesGrow	.291*	.324**	.302**	-.035	-.034	-.025	-.034	.146	-.077	.066	.037	-.004	.060	1

** . Correlation is significant at the 0.01 level (2-tailed). * . Correlation is significant at the 0.05 level (2-tailed).

7.2 Correlation Analysis

Variance inflation factors (VIF) and Durbin Watson tests were used to assess for multicollinearity problems. All the VIF coefficients were less than 2, thus it can be concluded that all the independent variables are free from serious problems of multicollinearity in the regression analysis. Using Pearson correlation analysis, the Net Operating Profit (NOP) measure showed a weak negative and not significant relationship with average payment period and the cash conversion cycle. NOP has a negative and significant relationship with average collection period; recording $R=0.419$, and a P-value $0.000 < 0.01$ significance level. However, NOP has no relationship with inventory conversion period, and this result is consistent with that of (Banos-Caballero, Garcia- Teruel and Martinze- Solano 2007, 164-177). These results suggest that to increase the profitability of a firm, managers must collect credit sales quickly; pay creditors in due time, and reduce the time lag between purchases of material and collection by sales of the finished goods.

The reason for the negative relationships between average collection period, cash conversion cycle and average payment period with profitability supports the view that the faster we sell inventory due to eased credit policy, the more the operating profit. Quick payment of suppliers ensures the firm its creditworthiness, means supplies are on time, and the possibility of cash discounts is supported by eased supplier credit policy, thus the firm's profitability is improved. This is consistent with the findings of (Deloof 2003, 573-587). The correlation of age of firm ($R=0.6$, P-value $0.000 < 0.01$ significance level), and sales growth rate ($R=0.291$, P-value $0.01 < 0.05$ significance level) with average collection period also significantly influences the net operating profit of the firms.

Table 2 shows that return on equity has a negative and significant relationship with average collection period ($R=0.299$, P-value $0.008 < 0.01$ significance level), and a negative relationship with cash conversion cycle. This implies that, managers should shorten the credit period and the time lag between purchases of raw

material and the collection of sales of finished goods, to increase returns on equity. However, the cash conversion cycle has little impact on return on equity. This result is in line with the research of many other scholars (Deloof 2003, 573-587; Mathuva 2010,1-11). The present study's results show that ROE has a weak positive but not-significant relationship with inventory conversion period, average payment period and net trade cycle. The result is consistent with (Mathuva 2010,1-11), and supports the notion that delays in paying creditors will enable the firm to have more cash that could be channeled into other activities (Nobanee and AlHajjar 2009, 488-495).

However, this notion is contrary to the finding of (Deloof 2003,573-587) that delays in paying creditors affects firm creditworthiness, and may alienate suppliers, distorting the firm's operations, and consequently affecting its profitability. Age of firm ($R=0.599$, $P\text{-value } 0.000 < 0.01$) is also shown in this study to have significant impact on the profitability of a firm (ROE). This may be because age relates to experience in building business networks and reliable suppliers and customers.

The correlation results also show that return on assets has a negative but significant relationship with average collection period ($R=0.607$, $P\text{-value } 0.000 < 0.1$ significance level). This has the same implication as to that of return on equity - managers have to shorten credit periods to increase return on equity. ROA has positive and significant relationship with inventory conversion period ($R=0.236$, $P\text{-value } 0.039 < 0.05$ significance level). This means that keeping a high level of inventory ensures smooth production processes, and avoids failure to meet customer demand (Blinder and Maccin 1991,73-96). The average payment period has a weak negative and non-significant relationship with ROA, and the cash conversion cycle has a non-significant positive relationship with ROA. The other variables which include financial leverage ($R=0.635$, $P\text{-value } 0.000 < 0.01$ significance level), size ($R=0.272$, $P\text{-value } 0.017 < 0.05$ significance level), age of firm ($R=0.600$, $P\text{-value } 0.000 < 0.01$ significance level), and sales growth rate ($R=0.324$, $P\text{-value } 0.004 < 0.01$ significance level).

significance level), have both positive and significant impacts on the return on assets of the firms. The positive relationship with financial leverage, size of firm, age of firm and sales growth rate means, the more the company employ debts financing, the more profitable (ROA) it becomes. R OA also increases as the firm expands in size, exist longer in the market and increase its sales.

7.3 The Regression Analyses

Pearson correlation explains inverse relationship between profitability (NOP, ROE, ROA) and the independent variables, but does not explain this cause and effect relationship. It is difficult to conclude whether a sole increase or decrease in average collection period, inventory conversion cycle, average payment period, conversion cycle, or net trade cycle leads to lower or higher net operating profits, returns on equity, or returns on assets. Careful analysis of the result is therefore required because Pearson and Spearman correlation between dependent variables and the independent variable is susceptible to auto correlation (Shin and Soenen 1998, 38-42). The conventional bivariate correlation does not take into account the correlation between each variable and all other predictor variables (Padachi 2006, 45-58).

In this regard, the multivariate least square regression models developed in this study were analyzed to estimate the coefficient of predictors. As for (DeLoof 2003,573-587), the predictors of firms' profitability (net operating profit, return on asset, and return on equity) were estimated by using the fixed effects models and pooled regression models presented in Tables 3 to 8. The fixed effect model explains the variation in profitability within firms, whereas the Pooled Ordinary Least Square model explains the variation in profitability between firms (Mathuva 2010,1-19). This study used the Fixed Effect Model instead of the Random Effect

Model, because the former ignores all the variables that do not vary with time (time invariant variables), and controls for unobservable heterogeneity, whereas the later includes time invariant variables (Deloof 2003,573-587). The comparison between the POLS and fixed effect models is important because the panel data analysis assumes individuals or variables are heterogeneous. We did not use the Random Effects Model time series and cross-sectional analysis, because they do not include heterogeneity and thus run the risk of delivering biased results.

Macroeconomic factors such as Gross domestic product (GDP) have been included in all models because they affect working capital management policies and practices in respect of inflation level and economic cycle (Banos-Caballero, Garcia- Teruel and Martinez- Solano 2007, 164-177). Asset tangibility ratio, sales growth rate, size of firm, and age of firm (natural logarithm of years since inception), have been included to control for firm characteristics. According to (Deloof 2003, 573-587) developing countries have less developed capital markets and are prone to information asymmetry and agency problems. Because developing countries have less developed capital markets though, trade credit and banking financing are more attractive to their firms (La Porta et al.,1997,1131-1150). For this reason, financial leverage (FinLev) has also been included in this study. Finally, the controls for industry, and firm characteristics such as management risk taking behavior (not reported), have been included in the regression models.

Consistent with (Deloof 2003,573-587), and according to the rule of Durbin Watson, the pooled regression models in NOP and ROA are potentially susceptible to autocorrelation between variables, thus the level of significance may be misleading. In this regard, determinants of a firm's net operating profit and return on assets are estimated by a fixed effect model. Consistent with (Mathuva 2010, 1-11), the determinants of ROE were estimated using a Pooled Regression Model. The other reason for using pooled OLS regression instead of Fixed effect estimators is because

under returns on equity, fixed-effect models (1, 2, and 3) are generally not significant, recording F-values of 1.73, 1.71 and 1.71 respectively. Both Pooled OLS and fixed effect models are presented here for comparison purpose.

Table 3: The Relationship between WCM and NOP using the Fixed Effect Model

Variable	Model 7	Model 10	Model 13	Model 1	Model 4
Const	0.65(0.984)	0.70(0.981)	-5.09(0.869)	4.99(0.873)	17.08(0.581)
ACP	0.03(0.624)				
ICP		0.05(0.033)**			
APP			0.03(0.317)		
CCC				0.03(0.181)	
NTC					0.08(0.020)**
FinLev	-31.04(0.000)***	-30.88(0.000)***	-32.42(0.000)***	-29.58(0.000)***	-28.21(0.000)***
AT	-2.38(0.708)	-1.09(0.859)	-2.981(0.636)	-1.16(0.855)	-1.41(0.817)
GDPGrow	-1.23(0.061)	-0.98(0.121)	-1.11(0.088)	-1.19(0.064)	-1.34(0.033)**
CS	-3.28(0.170)	-3.06(0.170)	-2.83(0.218)	-3.45(0.135)	-3.82(0.09)**
Age	26.18(0.001)***	23.18(0.002)	25.25(0.001)***	25.31(0.001)	23.71(0.002)***
SaleGrow	16.83(0.002)***	16.11(0.002)	17.37(0.001)***	15.81(0.003)	14.08(0.007)***
F-value	5.82***	6.89***	6.01***	6.2***	7.1***
Adj R Sq	52.93%	52.54%	56.82%	55.84%	60.32%
D-watson	1.92	1.802	1.636	1.533	1.418

Notes: The table shows that the leverage effect is negative against net operating profit and against age of firm and sales growth effect is positive. On the other hand, ICP and NTC are the only factor that effect net operating profit. The numbers in parenthesis are p-values.

Table 4: NOP regressed against WC using Pooled Regression Analysis

Variable	Model 7	Model 10	Model 13	Model 1	Model 4
Const	-13.794(0.182)	-4.994(0.691)	-8.517(0.431)	-11.422(0.304)	-14.069(0.161)
ACP	0.466(0.265)				
ICP		0.012(0.463)			
APP			-0.008(0.613)		
CCC				0.002(0.870)	
NTC					0.057(0.090)*
FinLev	-29.426(0.000)***	-27.395(0.000)***	-26.667(0.000)***	-27.18(0.000)***	-26.647(0.000)***
AT	11.050(0.03)**	8.559(0.180)	10.751(0.044)**	11.746(0.044)**	-13.303(0.012)***
GDPGrow	-0.948(0.184)	-0.986(0.177)	-0.9222(0.201)	-0.869(0.225)	-0.097(0.168)
CS	0.751(0.041)**	0.575(0.171)	0.658(0.093)*	0.74(0.051)**	0.848(0.02)**
AGE	8.741(0.000)***	8.242(0.000)***	8.124(0.000)***	8.018(0.000)***	7.855(0.000)***
SaleGrow	17.093(0.003)***	17.152(0.003)***	17.204(0.003)***	17.212(0.003)**	15.725(0.006)***
F-value	19.42***	19.12***	19***	18.91	20.13
Adj R Sq	62.92%	62.54%	62.38%	62.25%	63.79%
D-watson	0.92	0.902	0.936	0.933	1.018

Notes: Table 4 shows that the leverage effect is negative against net operating profit, but asset tangibility ratio, size, age of firms and sales growth effect are mostly positive. On the other hand, only NTC has any effect on net operating profit. The numbers in the parenthesis are p-values.

The relationship between Accounts Collection Period (ACP) and NOP

In Model 7, there is a positive but insignificant relationship between average collection period and net operating profit. The positive relationship between ACP and net operating profit is consistent with the findings of (Nobanee and AlHajjar 2009, 488-495). The findings imply that, to increase profitability of the company, managers should increase the time taken by customer to pay their dues (credit period). The coefficients of financial leverage, size of firm, asset tangibility ratio, age of firm and sales growth are significant, but that of gross domestic product is not. Net operating profit is negatively related to financial leverage ($P < 0.01$). This means that net operating profit decreases as a firm employs more debts, and this may be

due to an overwhelming fixed interest obligation in an unstable or low performing business environment. These findings are consistent with those of (Mathuva 2010,1-11) and (Deloof 2003,573-587).

Net operating profit increases with the increase with size of firm ($P < 0.05$), asset tangibility ratio ($P < 0.05$), and age of firm which is significant at the 1% level. Net operating profit also increases as the sales growth rate increases (significant at the 1% level. The model F-value (measures the significance of the model in predicting the dependent variable) was 5.82.42, at 1%. The model adjusted R^2 value was 52.93, which measures goodness of fit/usefulness of variables in the model. All variance inflation factors were less than 2, and the Durbin Watson statistic was 1.92.

The findings of this model suggest average collection period is not an important factor in determining corporate net operating profit. Instead, managers need to pay more attention to managing financial leverage, sales growth rates, total sales/sale volumes, and the employment of fixed assets.

The relationships between the Inventory Conversion Period (ICP) and NOP

In Model 10, Net operating profit (NOP) has a positive significant relationship with inventory conversion period. The results suggest that keeping a high level of inventory reduces the cost of failure to meet customer orders (loss of business due to scarcity), eases the shortage of seasonal product whose supply fluctuates over time (Blinder and Maccin 1991, 73-96), and protects the firm from the disruption of its production process. (Lazaridis and Tryfonidis 2006, 26-35) pointed out that most studies on WCM and profitability have not reported significant negative relationships between inventory conversion period and net operating profit. NOP has though a negative and significant relationship with financial leverage ($P < 0.01$). This means that the more debts the firm employs, the less NOP it achieves. NOP is

also positively and significantly related to age of firm with P-value<0.01 and a sales growth rate with p-value<0.01. The F-value was 6.89, significant at the 1%, level, and the adjusted R squared was 52.54. All variance inflation factors were less than 2, and Durbin Watson was 1.802.

The findings of this model suggest that the inventory conversion period is not an important factor in determining corporate net operating profit. Instead, managers should pay more attention to managing financial leverage, sales growth rate, total sales/sale volume, and employment of fixed assets.

The relationships between the Average Payment Period (APP) and NOP

In Model 13, NOP has a positive but insignificant relationship with average payment period. The findings imply that managers can withhold payments to suppliers to use the cash available to meet day to day operating expenses. Financial leverage has a negative and significant relationship with NOP (P<1%). NOP has a positive and significant relationship with age of firm (P<1%). Sales growth rate has a positive and significant relationship with Net operating profit (P<0.01), which means as sales increase net operating profit increases too. Net operating profit was negatively and significantly related to Gross Domestic product (P<0.01). The F-Value of the model was 6.01 and significant, while the adjusted R squared value was 56.82. and the DW test value 1.636. All variance inflation factors were less than 2.

The findings from this model suggest that the average payment period (APP) is not an important factor in determining corporate net operating profit. Instead, managers should pay more attention to managing financial leverage, sales growth rates, and total sales (sale volume).

The relationships between the Cash Conversion Cycle (CCC) and the NOP

In Model 1 there is positive relationship between net operating profit and the cash conversion cycle. This means net operating profit increases with the increase in overall number of days taken by the firm to move from purchasing of stock to collection of credit sales. However, the cash conversion cycle has no significant relationship with net operating profit, which means that while managers may consider managing CCC, they should not expect a significant impact on net operating profit. Financial leverage, asset tangibility ratio, size of firm, age of firm, and sales growth rate were statistically significant in this context. Financial leverage was negatively related to net operating profit, and this is significant at 1%. The asset tangibility ratio was positively related to net operating profit ($P < 0.05$). Size of firm is positively related to NOP, and this was significant at 1%. Sales growth rate was also positively related to net operating profit ($P < 0.01$). All variance inflation factors were less than 2. The model adjusted R squared value was 55.84, and the Durbin Watson test value 1.533.

The relationships between the Net Trade Cycle (NTC) and NOP

In Model 4, there are positive and significant relationships between net operating profit and the net trade cycle ($P < 0.05$). This means net operating profit increases with the increase in overall number of days taken by the firm from the purchasing of stock to the collection of credit sales. Other variables such as financial leverage, gross domestic product, size of firm, age of firm, and sales growth rate were also statistically significant. Financial leverage was negatively related to net operating profit, and this was significant at 1%. Gross domestic product is negatively related to NOP and is significant at 5%. The Size of firm was negatively related to NOP, and this was significant at 1%. Sales growth rate was positively and significantly related to net operating profit ($P < 0.01$). Finally, the model adjusted R squared value

was 60.32, and the Durbin Watson test value 1.418. All variance inflation factors were less than 2.

Table 5: The relationship between WCM and ROE using Fixed Effect Model

Variable	Model 9	Model 12	Model 15	Model 3	Model 6
Const	101.931 (0.313)	93.853 (0.342)	94.302 (0.341)	109.68 (0.272)	140.172 (0.163)
ACP	0.1067 (0.205)				
ICP		0.039 (0.570)			
APP			26.672 (0.200)		
CCC				0.068(0.299)	
NTC					0.187(0.070)*
FinLev	26.011(0.205)	25.553 (0.000)***	-4.597(0.819)	29.385(0.157)	32.888(0.109)***
AT	-3.834(0.849)	0.592(0.212)	-3.254(0.116)	-1.117(0.956)	-1.685(0.932)
GDPGrow	-3.275(0.113)	-2.968(0.152)	-9.74(0.226)	-3.145(0.123)	-3.521(0.081)*
CS	-2.001(0.79)	-1.043(0.886)	-1.154(0.874)	-2.143(0.769)	-3.087(0.668)
AGE	-6.278(0.790)	-9.205(0.701)	-5.750(0.808)	-8.554(0.716)	-12.591(0.588)
SalesGrow	43.785(0.009)	43.188(0.010)***	43.11(0.010)**	41.275(0.014)**	36.923(0.026)**
F-value	1.73	1.71	1.71	1.86*	2.26**
Adj R Sq	41.42	39.24	38.61	49.45	50.31
D-watson	1.261	1.812	1.836	1.931	1.468

Notes: Table 5 shows that leverage effect is negative against net operating profit and asset tangibility ratio, size, age of firms and sales growth effect are mostly positive. On the other hand, only NTC is had any effect to the net operating profit. The numbers in the parenthesis are p-values.

Table 6: The relationship between WCM and ROE using a Pooled OLS Model

Variable	Model 9	Model 12	Model 15	Model 3	Model 6
Const	-7.136 (0.808)	12.48 (0.725)	-2.131 (0.944)	1.293 (0.967)	-11.857 (0.678)
ACP	.029 (0.807)				
ICP		-0.037 (0.417)			
APP			-.012 (0.798)		
CCC				-.0213 (0.637)	
NTC					0.111 (0.246)
FinLev	-5.893 (0.664)	-4.948 (0.000)***	-3.686 (0.774)	-5.241 (0.674)	-3.340 (0.786)
AT	23.345 (0.112)	14.864 (0.409)	22.697 (0.130)	20.053 (0.220)	27.37 (0.067)*
GDPGrow	-2.442 (0.230)	-2.742 (0.184)	-2.464 (0.228)	-2.449 (0.227)	-2.581 (0.200)
CS	-1.975(0.059)*	-2.465 (0.040)**	-2.088 (0.060)***	-2.109 (0.049)	-1.752 (0.095)*
AGE	21.982(0.000)***	22.296 (0.000)***	21.704 (0.000)***	21.301(0.000)***	21.25(0.000)***
SaleGrow	51.894(0.002)***	51.791 (0.002)***	51.960 (0.002)***	51.93(0.002)***	49.08(0.003)***
F-value	10.01***	10.19***	10.02***	10.06**	10.39***
Adj R Sq	45.36	45.84	45.37%	45.49%	46.38%
D-watson	1.135	1.125	1.140	1.124	1.171

Notes: The size of firm has positive effect on ROE and age of firm and sales growth has positive effect on ROE. On the other hand, ACP, ICP APP, and NTC have no effect on ROE. The numbers in the parenthesis are p-values.

The relationship between the Accounts Collection Period (ACP) and ROE

In Regression Model 9 there is a positive but insignificant relationship between average collection period and return on equity. This positive relationship implies that, to obtain returns on equity of the company, managers should increase the time between the purchase of raw material and the collection of sales of goods sold. Managers should also offer more credit time to customers and delay to pay their creditors. Age of firm, size of firm, and sales growth are significantly related in this model. Return on equity increases with the age of firm .This implies firm returns to shareholders depends on the number of years in the market, which may be associated with experience, learning curves, customers' trust in the company's product, and any established reliable supply relationship. This is consistent with (Mathuva 2010,1-11) and (Deloof 2003,573-587). Return on equity also has a

positive and significant relationship with sales growth rate ($P < 0.01$). However, return on equity is negatively and significantly related to size of firm ($P < 0.01$). The Model's F-value was 10.39, and this was significant at the 0.01 significance level. The model adjusted R squared was 46.38%. The Durbin Watson statistic and variance inflation factor, which was less than 2, showed that there was no autocorrelation among independent variables.

The findings from this model suggest that the average collection period is not an important factor in determining corporate net operating profit. Managers should therefore pay more attention to the management of the employment of fixed assets, size of firm, total sales and sales growth rate.

The relationships between Inventory Conversion Period (ICP) and ROE

In Model 12, return on equity has a negative and insignificant relationship with inventory conversion period. This implies that assets purchased using debt financing do not earn more than the cost of the debt, or in other words, the tax shield advantage provided by financial leverage does not save equity. This finding is consistent with (Famil and Akgun 2016, 1-14). Return on equity is also negatively and significantly related to size of firm with a P-value less than 0.05 significance level. ROE has a positive and significant relationship with age of firm and sales growth rate, with P-values less than 0.01 across the board. The F-value was 10.19 and significant at 1%, the adjusted R squared was 45.54, and all variance inflation factors were less than 2. The Durbin- Watson test result was 1.125.

The relationship between the Average Payment Period (APP) and ROE

In Model 15, ROE has a negative but insignificant relationship with the average payment period. This supports the notion that more profitable firms take a shorter time to pay their bills. The other variables in the model were significant: return on

equity had a negative and significant relationship with size of firm as measured by the natural logarithm of total sales ($P < 10\%$ significance level); ROE had a positive and significant relationship with age of firm ($P < 1\%$); and the sales growth rate had a positive and significant relationship with the return on equity ($P < 0.01$). The F-Value of this model was 10.02 and significant. The adjusted R squared was 45.37, and the DW test result was 1.140. All variance inflation factors were less than 2.

The findings of this model suggest the average payment period (APP) is not an important factor in determining corporate net operating profit. Instead, managers should pay more attention to managing sales growth rates, and total sales (sale volume).

The Relationship between the Cash Conversion Cycle (CCC) and ROE

In Model 3, ROE has a negative relationship with the cash conversion cycle. This means returns on equity increase with the decrease in the overall number of days taken by the firm from purchasing of stock to collection of credit sales. The cash conversion cycle, however, has no significant relationship with return on equity. This means that managers may consider managing CCC, but should not expect significant impact on their net operating profit. The other variables: size of firm as measured by natural logarithm of sales, age of firm, and sales growth rate were statistically significant. Size of firm and age of firm were negatively related to return on equity, and this was significant at 5%. Sales growth rate was also positively and significantly related to return on equity ($P < 0.01$). The model's F-value was 10.06 and significant. The model adjusted R squared was 45.49%, and the Durbin Watson test value was 1.124. All variance inflation factors were less than 2.

The relationships between the Net Trade Cycle (NTC) and ROE

In Model 4, there was a weak positive and insignificant relationship between return on equity and the net trade cycle. The other variables: size of firm, age of firm, and sales growth rate were statistically significant. Size of firm is negatively and significant related to return on equity ($P < 0.01$). Age of firm was positively related to return on equity, and significant at the 1% level. The model F-value was 10.39 and significant at the 1% level. Model adjusted R squared is 46.38 and Durbin Watson is 1.171. All variance inflation factors were less than 2.

The findings in this model suggest that the net trade cycle is not an important factor in determining a firm's return on equity. Instead managers should employ more fixed assets to increase production capacity, which will in turn increase sales and eventually return on equity.

The relationship between average collection period (ACP) and ROA

In Model 8, there is a weak negative and insignificant relationship between average collection period and return on assets (Table 7). This implies that, to increase return on assets, managers should decrease the time taken by debtors to pay their bills. Other independent variables: financial leverage, size of firm, age of firm, and sales growth rate were significant. Financial leverage was negatively related to return on asset and significant at 1%. This means that the return on assets decreases as a firm employs more borrowings and vice versa. This outcome is consistent with other studies such as (Deloof 2003, 573-587); (Mathuva 2010,1-11), and (Famil and Akgun 2016, 1-14). Size of firm also found to be negatively related to return on assets ($P < 0.01$). The negative relation between ROA and size of firm implies that the return on assets decreases as a firm expands, which may be because of different factors such as reductions in price, or slow increases on sales relative to the cost of fixed assets employed. Age of firm was positively related to

return on assets and significant at 5%. The positive relationship between age of firm and ROA makes sense with respect to learning curve theory, which suggests experience increases efficiency and effectiveness. Sales growth rate was also positively related with return on assets in this model. The model F-value was 6.44, and was significant at 1%. The adjusted R² was 56.98%, DW was 1.621, and all variance inflation factors were less than 2.

Table 7 shows that leverage and size of firm have a negative effect on ROA, with some exceptions. Age of firm and sales growth had a positive effect on ROA. On the other hand, only the NTC had a negative effect on ROA. The numbers in the parenthesis are p-values. Table 8, on the other hand, shows that leverage and size of firm have negative effects on ROA.

Table 7. The relationship between WCM and ROA using a Fixed Effect Model

Variables	Model 8	Model 11	Model 14	Model 2	Model 5
Const	117.639 (0.002)***	115.92 (0.001)***	-116.63 (0.001)***	116.4 (0.002)***	0.038(0.295)
ACP	.014 (0.847)				
ICP		-.004 (0.871)			
APP			-.004(0.883)		
CCC				0.0007 (0.976)	
NTC					-23.54(0.002)***
FinLev	-25.00 (0.001)***	-25.147 (0.001)***	-24.922 (0.001)***	-25.068(0.001)***	-9.40(0.188)
AT	-9.93(0.169)	-10.214(0.158)	-10.028 (0.636)	- 10.033 (0.170)	-1.1213 (0.123)
GDPGrowth	-1.06 (0.148)	-1.062(0.150)	-1.106(0.163)	-1.044 (0.152)	-8.38(0.002)***
CS	-8.080 (0.004)	-7.938 (0.003)***	- 1.058 (0.150)	-7.957 (0.003)***	15.321(0.071)*
AGE	16.590 (0.051)**	16.776 (0.052)	-7.97 (0.003)***	16.509 (0.053)**	21.34(0.001)***
SalesGrowth	22.76(0.000)***	22.82(0.000)***	16.66(0.052)**	22.73(0.000)***	23.22(0.001)***
F-value	6.44***	6.44***	6.44***	6.43***	6.70***
Adj R Sq	56.98%	58.42%	61.21%	54.86%	61.24%
D-watson	1.621	1.642	1.626	1.688	1.688

Note: Table 7 shows that leverage and size of firm have negative effect on ROA with some exceptions. Age of firm and sales growth have positive effect on ROA. On the other hand, only the NTC have a negative effect on ROA. The numbers in the parenthesis are p-values.

Table 8. The relationship between WCM and ROA using Pooled OLS Model

Variable	Model 8	Model 11	Model 14	Model 2	Model 5
Const	37.487 (0.002)***	40.11935(0.008)***	43.158(0.001)	26.57(0.046)	27.729(0.024)
ACP	-0.12(0.013)***				
ICP		-.0228(0.231)			
APP			-.0578(0.004)***		
CCC				0.008(0.640)	
NTC					0.025(0.529)
FinLev	-33.22 (0.000)***	-39.09(0.000)***	-34.903(0.000)***	-38.55(0.000)	-38.57(0.000)***
AT	6.622(0.257)	0.592(0.937)	-2.167 (0.712)	7.354(0.282)	6.796(0.277)
GDPGrow	-.4786 (0.555)	-.879 (0.305)	-.974 (0.226)	-.645 (0.445)	-0.708(0.402)
CS	-1.458 (0.001)	-1.683(0.001)***	-1.840 (0.000)***	-1.342 (0.003)	-1.34(0.003)***
AGE	7.35(0.000)***	9.78(0.000)***	10.17(0.000)***	9.39(0.000)***	9.24(0.000)***
SaleGrow	24.170(0.000)***	23.766(0.001)***	23.851 (0.000)***	23.889 (0.001)***	23.22(0.001)***
F-value	28.28***	25.71***	29.48***	25.09**	25.18***
Adj R Sq	71.53%	72.29%	72.4%	68.93%	69.01
D-watson	0.969	0.749	0.973	0.826	0.818

Note: Table 8 shows that leverage and size of firm have negative effect on ROA. Age of firm and sales growth have positive effect on ROA. On the other hand, only the NTC have a negative effect on ROA. The numbers in the parenthesis are p-values

The relationship between the Inventory Conversion Period (ICP) and Return on Assets

In Model 11, return on assets has a negative and insignificant relationship with inventory conversion period. These results suggest that maintaining high levels of stock reduces the cost of failure to meet customer orders (Blinder and Maccin 1991, 73-96), and also ensures a smooth production process.

However, ROE increases with the decrease of financial leverage ($P < 0.01$). This implies that assets purchased using debt financing do not earn more than the cost of debt, or the tax shield advantage provided by financial leverage does not save equity. This finding is consistent with (Famil and Akgun 2016,1-14). Return on equity is also negatively and significantly related to size of firm with a P-value less than 0.05 significance level. However, ROE also has positive and significant

relationships with age of firm and sales growth rate, with P-values less than 0.01 across the board. The F-value was 10.19 and significant at 1%, the adjusted R squared was 45.54. All variance inflation factor were less than 2, and Durbin Watson test result was 1.125.

The relationship between Average Payment Period (APP) and Return on Assets

In Model 14, return on assets has a weak negative and insignificant relationship with average payment period. This means that more profitable firms take shorter time to pay their bills. The other variables in the model are significant. Return on equity has negative and significant relationship with age of firm and financial leverage (P<1% significance level). ROE has a positive and significant relationship with sales growth rate (P<5%). The F-Value of the model was 6.44, and was significant (P<0.01). The adjusted R² value was 61.2%, and the DW 1.626. All variance inflation factors were less than 2. The findings of this model suggest that the average payment period (APP) has a negative relationship with return on assets, but that it is not an important factor in determining corporate net operating profit. Instead, managers should pay more attention in managing, sales growth rate, financial leverage and total sales (sale volume).

The relationship between the Cash Conversion Cycle (CCC) and Return on Assets

In Model 2, return on assets has a weak positive and insignificant relationship with the cash conversion cycle, which means CCC is not an important factor in determining the level of return on assets. The other variables: financial leverage, size of firm, age of firm, and sales growth are also significantly related to return on assets. Financial leverage and size of firm are negatively and significantly related to return on assets, with a P-value less than 1% significance level. Age of firm is positively and significantly related to return on assets (P<0.05), as is sales growth

rate, with a P-value less than then 1% significance level. The F-value was 6.43, and was significant at the 1% level. The model adjusted R squared was 54.86%, and the Durbin Watson test value was 1.688. All variance inflation factors were less than 2.

The relationship between Net trade Cycle (NTC) and Return on Assets

In Model 5, return on assets has a negative and significant relationship with net trade cycle. This means managers should reduce the time lag between purchases of products/material to actual collection of cash from sales of finished goods. Other variables: financial leverage, gross domestic product, size of firm as measured by natural logarithm of total sales, age of firm a, and sales growth rate, had a significant relationship with return on assets.

For example, financial leverage has a negative and significant relationship with return on assets ($P < 0.01$). This is consistent with (Deloof 2003, 573-587) and (Mathuva 2010,1-11), who studied the relationship between WCM and firm profitability. The results suggest the return on assets decreases with the increase in the employment of borrowed funds. This may be caused by the slow generation of profit in the early years of assets that were bought using borrowed money at high interest rates. Gross domestic product growth rate in normal terms is also negatively related to return on assets at the 1% significance level. The negative relationship between corporate firm process and gross domestic product is very interesting. This is because generally, high economic growth as measured by GDP accounts for a high level of consumption and investment in the country, which essentially, should trigger corporate profits.

Thus, social, political, and economic pressures should eventually cause the growth in corporate profits and the returns in the broader economy to realign (Khan Suresh and Ethan, 2015). However, this is not the case in Tanzania, with respect to the

firms listed in DSE. This situation may be caused by government fiscal taxes such as relatively higher corporate income tax rates, and the accounting treatment of firms. Both size of firm and age of firm have a positive and significant relationship with return on assets ($P < 0.01$). Sales growth rate also has a positive and significant relationship with return on assets. The F-value of this model was 6.7; significant at the 1% level. The adjusted R^2 value was 61.24%, and the Durbin Watson test value was 1.688. All variance inflation factors were less than 2.

8. Conclusions

Based on the major findings from this study, management can increase the net operating profit of a company by increasing inventory conversion periods and the length of the net trade cycle. On the other hand, to improve returns on assets, management should decrease the length of the Net Trade Cycle. This dilemma calls for management to choose which profitability measure they are interested in based on internal or external financial objectives.

Managers can also increase the value of equity holders by increasing the time lag between purchases of material and actual collection of cash from sales of finished goods (measured by the net trade cycle,) and by increasing the number of days taken to sell off inventory. The net trade cycle cannot be a substitute for the cash conversion cycle however, as they have different relationships and level of significance with measures of profitability. Managers should also maintain a low level of financial leverage to increase profitability.

Based on these findings, the management of CCC, ACP, ICP, APP and NTC will have little or no effect on the return on equity. Control of the average collection period, inventory conversion period, average payment period and cash conversion cycle have no influence on the return on assets. Other variables such as financial leverage, size of firm, age of firm, sales growth rate, GDP, and asset tangibility (ratio of fixed asset to total assets) have a significant impact on the overall profitability of firms. Financial leverage is negative and significant across all measures of profitability. This may be caused by the slow generation of profit in early years of assets that were bought using borrowed money that entailed high interest costs. The GDP growth rate in normal times is negatively related to the return on assets at the 1% significance level.

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