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# Working Capital Management and Performance of Commercial and Services Firms Listed at the Nairobi Securities Exchange

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***Abstract***

*The effect of working capital management on the financial performance of commercial and services firms listed at the Nairobi Stock Exchange over the period 2012 to 2017 is examined in this study. The return on assets (ROA) across three working capital groups is compared. The measure of working capital is a cash conversion cycle (CCC). The worst performing firms tend to have low CCC days whereas the highest performing firms tend to have moderate CCC days, and their degrees of variability are more stable. The cash conversion cycle is related to the financial performance of commercial and services firms listed at the Nairobi Securities Exchange. The firms with negative or too short CCC days performed poorly and were mainly firms that sell their goods and services on cash terms, namely supermarkets and hotels. Commercial firms listed at NSE should adopt a moderate cash conversion cycle, with an average of 75 days and is the average CCC period.*

***Keywords:*** *Working Capital, Performance, Return on Assets (ROA), Cash Conversion Cycle (CCC), ANOVA*

## Introduction

Management of working capital is a major finance function in commercial firms. Working capital management is about maintaining firm liquidity, which is, being able to meet cash obligations as they become due. In the words of Moyer, McGuigan and Rao (2018) working capital management involve a number of day to day operations and decisions that define the firms level of current assets; the proportions of short-term and long term debt the firm will use to finance its assets; the level of investment of each type of current assets; and the specific source and mix of short term credit (current liabilities) the firm should employ. Therefore, one would expect some relationship between management of working capital and firm performance (Deloof, 2003). The assumption is that choosing a working capital management policy is a tradeoff between return and risk because increased profitability is accompanied by increased risk. This study is about the impact of working capital on profitability. Finance theory tells us that excessive working capital levels can result in a substandard return on assets (ROA). Equally too low level of working capital

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lower profitability due to stock-outs, few credits, and lost sales. This requires identification of the optimal amount to invest in working capital; and this explains why firms adopt different working capital management policies. This study identified optimum cash conversion cycle days, similar studies relied on regression analysis but fail in identifying optimum days.

The above-average performance of the business is a fundamental indicator of its ability to earn good returns to the owners and its survival. A performing business retains shareholders and also attracts new capital required for growth. Profitable and financially sound firms can pay dividends, pay their creditors, and create new growth opportunities. Sharma and Kumar (2011) used four performance indicators, namely: profitability, liquidity, managerial efficiency analysis, and leverage in the period between 2001 and 2011. Return on assets (ROA) is considered appropriate measure of performance because it compares a firm's earnings to amount invested. Posting good financial performance requires generating higher sales, profits, and effective cost management (Peterson & Rajan, 1994).

Firms that do not have sound working management strategies experience reduced profitability and even financial distress thus risk going out of business (Brigham & Houston, 2008). Management of working capital is vital in boosting the wellness of firms of various sizes financially (Padachi, 2006). This is because investments in working capital involve substantial amounts of money that must be properly managed (Smith, 1980).

Commercial and services firms listed at NSE have had various operational challenges (www.nse.co.ke). Their challenges are linked to stiff competitions, high operation costs, poor management, and many more. These challenges have even led to closures of some of their functions for instance a tire manufacturing firm closed down its factory citing high reorganization expenses (Business Daily).

**Research Problem**

Effective working capital management improves profitability thereby creating wealth to shareholders (Penman, 2013). Firms that do not manage their working capital well are exposed to costs associated with a worsening credit rating, a potential fire sales of assets and possible bankruptcy. Furthermore, a firms working capital positions affect its ability to raise debt in capital markets. Jose, Lancaster and Stevens (1996) traced better performance to working capital management practices. Shin &Soenen, (1998) and

Deloof, (2003) observed that effective management of working capital improves performance. Ofwa et al (2015) found out that levels of accounts receivable and inventory explain the level of firm performance. On the other hand, Mathuva (2010) concluded that working capital management does not affect firm performance. Gakure, et al. (2012), Afza & Nazir, (2007), and Falopeet et al, (2009) found no relationship between working capital management and firm performance. Blomdahl, and Andersson (2017) concluded that the impact of the cumulative cash conversion cycle on market value nor profitability is insignificant.

Ogundipe, et al. (2012) found a negative relationship between cash conversion cycle (CCC) and firm performance. Samiloglu and Demirgunes (2008) and Ayiro (2012) reported a negative relationship between working capital and profitability. Therefore, the effect of working capital management on firm performance is an unresolved issue. Furthermore none of the previous studies made attempt to establish the optimum cash conversion cycle days that maximize return on assets. The research question is: How does working capital management affect the financial performance of commercial and services firms listed at the Nairobi Securities Exchange?

**Literature Review**

The core purpose of all firms is to be profitable, be financially sound while attaining acceptable growth in order to maximize shareholder's wealth (Brealey, Myers & Allen, 2014). Transaction cost economics theory by Ronald Coase (1937), refined by Oliver E. Williamson (1981) suggest that firms minimize their internal transaction costs to improve their profitability. For example, this theory explains why the required level of stock in goods is determined by comparing the cost of keeping stock to the benefits of keeping stock. These cost relates to ordering carrying costs and stocks out costs. Carrying cost is costs of acquiring inventory, staff employed to facilitate ordering of goods, expenses incurred for the transportation of goods, cost of stationery, postage and telephone charges, interest paid on the amount used to acquire inventory. The other costs relate to the cost storage, cost of insurance, cost of destruction of materials while handling them, cost of deterioration of materials and many more (Pandey, 2010). The preceding costs interface with the three source of transaction costs namely: environmental uncertainty and bounded uncertainty, opportunism and small numbers and risk and specific assets because firms negotiate with customers, suppliers and employees.

Working capital management is about the control and planning of both temporary assets and liabilities to enable a business to meet its legal commercial duties and to eliminate uncertainties, while earning acceptable return to shareholders (Eljelly, 2004). Management of working capital ensures enough cash flows to cater for its daily expenses and to meet its other immediate financial obligations (Brigham & Houston, 2008).

Firms that badly manage working capital are exposed to liquidity risk and face bankruptcy (Kargar & Bluementhal, 1994). The levels of components of working capital management have a huge impact on firm liquidity and returns (Maness, 1994). A too liquid firm may not earn the required returns on its assets (Gitman, 1997). Eljelly (2014) opines that working capital management is among the most important areas to be considered when planning profits and liquidity levels within a firm. Ogundipe, Idowu, and Ogundipe (2012) emphasized that when account's receivables, inventories, and accounts for payables are not managed properly, it will result in difficulties in a firm's daily operations and will also affect the market values of shares of such firms. The drivers of current assets and current liabilities that affect firm performance are the costs of maintaining account's receivables, inventory, and accounts payable.

Firms invest in account's receivables as a way of improving theirs sales and profitability (Moyer, McGuigan and Rao, 2018). Accounts receivable management focuses on the firms overall credit and collection policies and credit rating of customers. The focus is on credit standards, credit terms and collection effort (Moyer, McGuigian and Rao, 2018). The credit policy and period shape the level and quality of the account's receivables (Robichek, Teichroew, and Jones, 1965). The trade credit policy has effect sales level, sales growth, profitability, liquidity and capital structure (Bierman, Chopra and Thomas, 1975). In managing accounts receivable, the most feared risk is default risk because it exposes firms to losses. The collection period shapes the amounts of uncollectable and subsequent profitability and value of firms (Brealey, Myers & Allen, 2014).

The drivers of the amount invested in accounts receivables are credit period)\, the period the buyer has to get cash discount, and the rate of cash discount. Credit terms are normally classified into credit period and credit discount (Pinches, 1992). Factoring of account's receivables can be employed to minimize loss from customer's default and to enhance firm liquidity.

Ikechukwu and Nwakaego (2013) report a positive relationship between effective management of account's receivables and business performance in Nigerian manufacturing firms; and trace the relationship to credit policies of the sampled firms. A liberal trade credit policy can send a firm into a financial crisis (Niskanen & Niskanen, 2000). This explains why firms must ensure that credit sales be supported by prompt payment through extending credit to credit worthy customers (Al-Mwala, 2012).

The inventory-related costs are ordering costs, carrying costs and stock out costs. Managing inventories involve balancing the costs of ordering inventories and the benefits of holding to avoid stock out. The inventory conversion period (ICP) is used to monitor how effective management is controlling inventories this to make sure goods are available to customers on demand (Chambers & Lacey, 2011). When inventories are efficiently managed, the liquidity of such business is stabilized and this, in turn, ensures that its legal commercial obligations are settled. A business that fails in managing inventory will lose customers and end up with dead stock (Pandey, 2010; Atrill, 2006). When inventories are at their optimal points, the cost associated with that product not being available is minimized, the price level is maintained (Nyabwanga et al, 2012). Efficient inventory management is the core of the sustainability and profitability of firms (Eya, 2016; Ghosh and Maji. 2004; Koumanakos, 2008). The proposition is that when the level of inventories stored by a firm is not optimal then the rate of return of that firm will be lower.

Firms invest in account's receivables as a way of improving theirs sales and profitability. Account's payables form a major part of unsecured short term financing for firms (Gitman, 1997). The market determines an acceptable accounts payable period (APP). Suppliers and even potential customers may lose confidence in a business that does not settle its financial obligations in time. Firms should, therefore, employ sound management of this short term liability (Ayiro, 2012). On the other hand, when payment of creditors is delayed, businesses can capitalize on this as a cheaper source of the fund except in cases where the supplier allows discounts (Raheman & Nasr, 2007). This period should be at optimum and measured by the computation of the APP.

Working capital management target drivers of the amount invested in current assets and level of current liabilities. The drivers are average collection period (ACP), inventory conversion period (ICP) average payable period (APP), which evaluates the period in days a business takes to pay its creditors (Pandey,

2010). The cash conversion cycle comprises of time taken to sell inventory and collect credit from customers less time taken to pay a business' suppliers.

Cash conversion cycle (CCC) is important because it is a component of operating cycle, and captures the period it takes to recover investment in working capital (Moyer, McGuigan and Rao, 2018). Cash conversion cycle (CCC) is the period a business takes to process its inventories purchased into receipts from its customers (Richards and Laughlin, 1980); it captures the amount invested in current assets (Gitman (1997). According to Richards and Laughlin, (1980) the cycle should be a tool to assess the management of liquidity and performance of businesses (Richards and Laughlin, 1980). When this cycle increases, liquidity will be at lower levels in businesses and the firm face liquidity risk (Schilling, 1996). When an optimum CCC is maintained liquidity and profitability will improve (Shin and Soenen, 1998; Lyroudi and Lazaridis, 2000; Raheman& Nasr, 2007). Deloof (2003) stresses that to ensure To reduce CCC and improve on both liquidity and performance, the periods for collecting monies from those who owe businesses should be minimized (Deloof, 2003).Some firms improve this cycle by delaying in payments to creditors. Lezaridis and Tryfonidis, 2006) assert that sound management of working capital require an optimal cash conversion cycle (CCC). The lower the CCC period the better, as this enables a business to boost its purchases and settle its temporary debts in real-time. This cycle is shortened if customers are encouraged to pay in time while payments to suppliers are made longer (Gitman, 1974).

**Data, Methods and Model**

The population was all commercial and service firms listed at NSE over the period 2012 to 2017. This an appropriate population because large listed firms are expected to have a formal working capital policy. The result was sixty-seven data points, and each data point is treated as an observation. The audited financial stamens were the major source of information. The information obtained related to income after tax, annual sales, purchases, total assets, cost of sales, accounts for receivables, inventories, and accounts for payables, which ensured the computations of ACP, ICP, APP, and indicator of performance (ROA). The relationship was modeled as follows:

$ROA = \alpha + \beta (CCC) + \varepsilon$

CCC=Cash conversion period; and $\varepsilon$ = Error

$\beta$ = rate of change in ROA given a change in CCC

The cash conversion period (CCC) is an index that makes it possible to compare performance against working capital across firms (Freeman and Soete, 2007). According to Freudenberg, 2003, composite indexes can be used to capture several identified phenomena into a single indicator.

## Data Analysis and Results

### Descriptive Statistics

Descriptive statistics summarize the minimum and maximum values, the mean, standard deviation and the variance of the data on the average credit period (ACP), inventory conversion period (ICP), average payable period (APP) are components of working capital and return on assets (ROA) as a measure of performance are in Table 1. The cash conversion cycle (CCC) is a composite index capturing working capital variables namely, average collection period (ACP); inventory conversion period (ICP); average payable period (APP).

**Table 1: Descriptive Statistics: ROA, CCC, ACP, ICP, APP**

| Variable | N | Mean | StDev | Minimum | Maximum |
|---|---|---|---|---|---|
| ROA | 67 | -0.22 | 18.38 | -71.97 | 47.73 |
| CCC | 67 | 113.5 | 240.6 | -758 | 915 |
| ACP | 67 | 94.4 | 125.1 | 8 | 604 |
| ICP | 67 | 149.7 | 168 | 0 | 946 |
| APP | 65 | 133.6 | 159.5 | 14 | 1083 |

The cash conversion cycle (CCC) captures the time (measured in days) it takes for a company to convert the amount invested in inventory and other resources into cash flows. The CCC = ICP+ACP-APP. It is a quantitative measure used to evaluate the efficiency of a firm's operations and management. The average return on assets (ROA) is the negative twenty-two percent, but there is the highest ROA of about forty-eight percent (47.73) and exhibits variability (18.38) worth explaining. The average CCC is one hundred and fourteen days with a standard deviation of 240.6 days.

**Table 2: Correlation: ROA, CCC, ACP, ICP, APP**

| | ROA | CCC | ACP | ICP |
|---|---|---|---|---|
| CCC | 0.250 | | | |
| | 0.041 | | | |
| ACP | 0.152 | 0.409 | | |
| | 0.220 | 0.001 | | |
| ICP | 0.063 | 0.572 | -0.141 | |
| | 0.613 | 0.000 | 0.255 | |
| APP | -0.192 | -0.584 | 0.009 | 0.109 |
| | 0.025 | 0.000 | 0.942 | 0.386 |

Cell Contents: Pearson correlation
P-Value

The correlation between ROA and CCC is 0.25 and statistically significant; ROA and ACP are 0.152 and i s not statistically significant; ROA and ICP are 0.063 and statistically insignificant. ROA is negatively cor related to the APP (-0.19). Between the independent variables, CCC and ACP are correlated (0.409); CCC and ICP are positively correlated (0.572); CCC and APP are negatively correlated (-0.584); ACP and ICP , ACP and APP are not correlated. There is no correlation between ACP and APP is almost zero (0.009). T herefore, these variables tell different stories. When the cash conversion cycle is increasing, the inventory conversion period increases but the accounts payable period decreases. The average payable period appear s to be reducing profitability.

**Comparisons of mean ROA among the CCC Groups**

The observations were ranked using CCC from the highest to the lowest and then divided into three groups, and the summary presented in Table 3. Group one(1) (low) are lowest CCC days, ranging from -758 days to eleven days; Group two(2) (moderate) is the average CCC days ranging from 11 days to 166 days, and the third group (3) (high) had the highest CCC days ranging from 167 days to 915 days. The ROA of these groups is compared using ANOVA to determine the effect of CCC on firm performance and the result presented in Table 4, Graph 1, and Table 6.

**Table 3: Descriptive Statistics – Cash Conversion Cycle**

| Class | N | Mean | StDev | Minimum | Maximum |
|---|---|---|---|---|---|
| Group1 | 22 | -87.4 | 173.3 | -758 | 11 |
| Group2 | 23 | 75 | 48.6 | 11 | 166 |
| Group3 | 22 | 354.6 | 211 | 167 | 915 |

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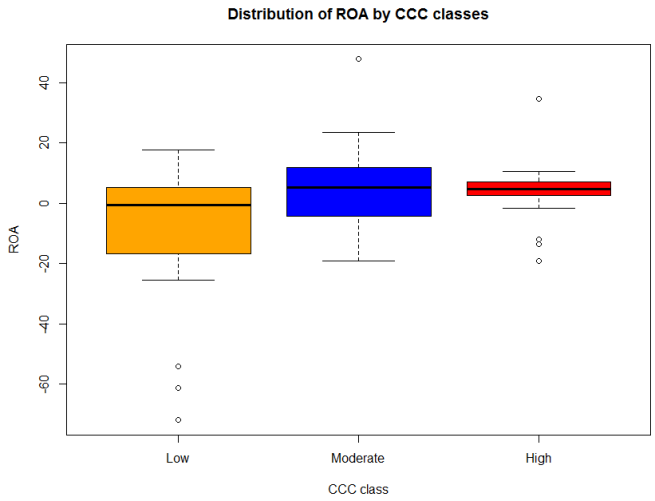
The mean CCC days for group one (1) are -87.4 days, group two (2) mean is 75 days cycle and group three (3) average is 354.6, which is over one year cycle. The data in table 4 show us that the group with lowest CCC posted the worst ROA, a loss of about ten percent (-10.15%), the group with average CCC posted the best ROA of about six percent (5.79%) and the group with the highest CCC posted a return of three percent (3.43%). It appears that CCC matter as the firms falling within the average CCC post the highest ROA. Graph 1 confirms the preceding observation.

**Table 4 Return on Assets across CCC Groups**

| Groups | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Min. | Max. |
|---|---|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound | | |
| 1 | 22 | -10.15 | 24.05 | 5.13 | -20.81 | 0.51 | -72 | 17.5 |
| 2 | 23 | 5.79 | 14.54 | 3.03 | -0.49 | 12.08 | -19.1 | 47.7 |
| 3 | 22 | 3.43 | 10.26 | 2.19 | -1.12 | 7.98 | -19.1 | 34.6 |
| Total | 67 | -0.22 | 18.38 | 2.25 | -4.70 | 4.27 | -72 | 47.7 |

The box float graph shows the distribution of mean standard deviation and the quartiles of the return on assets against the three classes of the cash conversion cycle. It shows that the ROA of group1, a group with the lowest CCC is different from the other two groups. Graph 1 Distribution of Return on Assets by cash conversion cycle classes.



Group one which represents low CCC is negatively skewed to a larger extent, group two, which represents moderate CCC is slightly skewed to the left, and group three which represents high CCC is symmetrical. The moderate CCC appears to be appropriate.

**Analysis Of Variance (ANOVA)**

The next step was to use a one-way analysis of variance (ANOVA) to compare the return on assets for the three groups. The question was: Is there a difference in performance (ROA) based cash conversion cycle (CCC)? ANOVA is used when the dependent variable is continuous, but the independent variable is categorical. The independent variable is CCC, and the dependent variable is ROA. In the ANOVA table 5, the p-value of 0.006) indicates that there is sufficient evidence that not all the means are equal when alpha is set at 0.05. The average predicted $R^2$ (14.48%) suggests that the model will moderately predict new observations nearly as well as it fits the data.

**Table 5. ANOVA CCC v ROA**

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 3293.42 | 2 | 1646.711 | 5.545 | .006 |
| Within Groups | 19007.78 | 64 | 296.997 | | |
| Total | 22301.20 | 66 | | | |

**Table 6: Model summary**

| Model | R | R squared | Adjusted R square | The standard error of estimate | F statistics | P-value |
|---|---|---|---|---|---|---|
| 1 | 0.384 | 0.1448 | 0.121 | 17.23 | 5.545 | 0.006016 |

The mean differences in table 7 show that group one has -15.94 mean difference with group two and -13.58 mean difference with group three. Group two has a 2.365 mean difference with group three.

**Table 6: Comparison of mean among classes of the cash conversion cycle**

| Cash Conversion Cycle | | | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Tukey HSD | 1.00 | 2.00 | -15.94* | 5.13933 | .008 | -28.2739 | -3.6111 |
| | | 3.00 | -13.58* | 5.19612 | .030 | -26.0450 | -1.1096 |
| | 2.00 | 1.00 | 15.94* | 5.13933 | .008 | 3.6111 | 28.2739 |
| | | 3.00 | 2.36 | 5.13933 | .890 | -9.9662 | 14.6967 |
| | 3.00 | 1.00 | 13.58* | 5.19612 | .030 | 1.1096 | 26.0450 |
| | | 2.00 | -2.37 | 5.13933 | .890 | -14.6967 | 9.9662 |
| LSD | 1.00 | 2.00 | -15.94* | 5.13933 | .003 | -26.2095 | -5.6755 |
| | | 3.00 | -13.58* | 5.19612 | .011 | -23.9577 | -3.1968 |
| | 2.00 | 1.00 | 15.94* | 5.13933 | .003 | 5.6755 | 26.2095 |
| | | 3.00 | 2.37 | 5.13933 | .647 | -7.9018 | 12.6322 |
| | 3.00 | 1.00 | 13.58* | 5.19612 | .011 | 3.1968 | 23.9577 |
| | | 2.00 | -2.37 | 5.13933 | .647 | -12.6322 | 7.9018 |

*. The mean difference is significant at the 0.05 level.

The result shows Tukey's HSD simultaneous 95% Confidence Interval (CI) tests for differences. The Tukey's comparisons tell us that if the interval does not contain zero, then the corresponding means (ROA) are significantly different. In table 6 looking at CIs, the difference in ROA between group one and group two does not contain zero and is, therefore, significantly different; the difference in ROA between group one and group three does not contain zero and is, therefore, significantly different. However, the interval between groups two and three do not contain zero. Therefore, there is no difference in their ROA.

**Findings and Discussions**

This research sought to determine the effect of working capital management on financial performance by relating the cash conversion cycle to return on assets. The companies with negative working capital sell on cash but delay payments to suppliers but this impact adversely on their performance. The data show that variations in return on assets vary across the different cash conversion cycle. The ROA in firms with negative CCC (group one with average CCC of -87.4 days) is below those with positive CCC (group two and three). Firms with moderate CCC policy, which is an average of 75 days cash flow conversion cycle outperformed other groups, though there is not much difference in ROA between groups two and three.

The variable's average credit period, inventory conversion period, and cash conversion cycle all have positive connections to return on assets though the relationship is weaker. For instance, as CCC increases,

ROA tends to increase but at a weak rate. This means that a longer CCC leads to a slight increase in ROA may be because of the motivation customers get when they pay later than expected. They are not offered incentives such as discounts. This is consistent with findings by Niskanen & Niskanen, (2000) who concluded that firms with higher growth rates reflected on increased sales offer fewer credit periods. This is also consistent with Al-Mwala, (2012). Efficient management of inventory is part and parcel of sound working capital management, therefore a moderate day's sales are outstanding leads to better financial management, a fact supported by Ghosh and Kumar, (2007) and Mbula, Memba and Njeru, (2016).

The CCC is driven by ACP, ICP, and APP, and these must be managed to target the required CCC. In the literature as ACP increases, ROA also increases. This means that as day's sales are outstanding increased, customers are motivated to pay due to lack of stringent credit policy, and finally, when day's inventory outstanding is increased, ROA increases very slightly perhaps because of reduced ordering costs. APP, on the other hand, has an inverse relation to ROA. This means that when APP increases, ROA tends to decrease. An increase in days, suppliers are paid leads to a decrease in ROA. Duru, Ekwe and Okpe, 2014) noted a strong negative relation of the debt ratio with sales growth. Makori and Jagongo, (2013) and Eljelly, (2004) found a negative relationship between the two independent variables on the profitability of firms.

**Conclusions and Recommendations**

The worst performing firms tend to have low CCC whereas the highest performing firms tend to have moderate CCC, and their degrees of variability are more stable. The firm with the best performance has ROA of the cash conversion cycle is related to the financial performance of commercial and services firms listed at Nairobi Securities Exchange. The firms with negative or too short CCC performed poorly and were large firms that sell their goods and services on cash terms such as supermarkets and hotels. The findings suggest that commercial firms listed at NSE follow to adopt a moderate cash conversion cycle. The target CCC for commercial firms should average 75 days. A similar study should be conducted on small and medium enterprises using composite indexes. There is a need to establish the individual optimum levels of the components of CCC.

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