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## Working Capital Management And Corporate Performance. Special Reference To Manufacturing Firms On Nairobi Securities Exchange

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### **Abstract:**

*This paper captures aspects regarding relationships between Working Capital Management and Corporate Performance of manufacturing firms listed on the Nairobi securities exchange. A sample of 20 companies whose data for 5 years from 2007-2011 was selected. For analysis Principal components analysis (PCA) is used due to its simplicity and its capacity of extracting relevant information from confusing data sets. Regression of the principal component show that that working capital proxies CCC, ACP and control variables CLTA, NSCA & FATA are significant at 95% confidence (p values are < .05) To performance.*

### **1.Introduction**

Working capital management WCM is one of the important issues in financial management and decision making. WCM could be permanent or temporary. Permanent working capital is the amount of current assets that a firm possess for a longer period of time to offset the liabilities while temporary is the excess of the current assets to meet seasonal current liabilities. ( Van horn 2005)

Working capital can also be classified as aggressive policy, moderate policy or conservative policy. In aggressive policy all non-current assets are financed by long term sources of funds and current assets are financed by short term sources of funds. It is where a firm has fewer assets in proportion of total assets or when a firm has a high proportion of liabilities which may lead to a firm having low liquidity or high profitability. For conservative policy all non-current and temporary assets are financed by long term sources of finance. Short term sources to be used only in times of emergencies (Irfan 2011). Conservative approach may lead to high liquidity and less risk of stock out but more interest is given to the seasonal requirement for the whole period. For moderate policy all non-current assets are financed by long term sources of finance while temporary and fluctuating assets are financed by short term sources of finance.

The main objective of working capital management is to ensure that a firm is able to meet its current and future obligation as when they are due. It aims at maintaining the optimum balance between each component of working capital, accounts receivables, accounts payable, and levels of inventory. ( Zahra &Azam 2012). Excessive levels of current assets may negatively affect the firm's performance. It's difficult to trying to achieve and optimum working capital for a firm. If a firm has a large stock of inventory it means it will never experience stock out thus customers will always get the goods when due and on the other hand there will be an additional cost of holding stock in the form of warehouse space, insurance and also inventories are non-earning asset. In order to improve the effectiveness of working capital it is important to shorten the working capital cycle. The cycle measures the time from paying for the goods supplied by creditors to receiving cash from debtors after sale

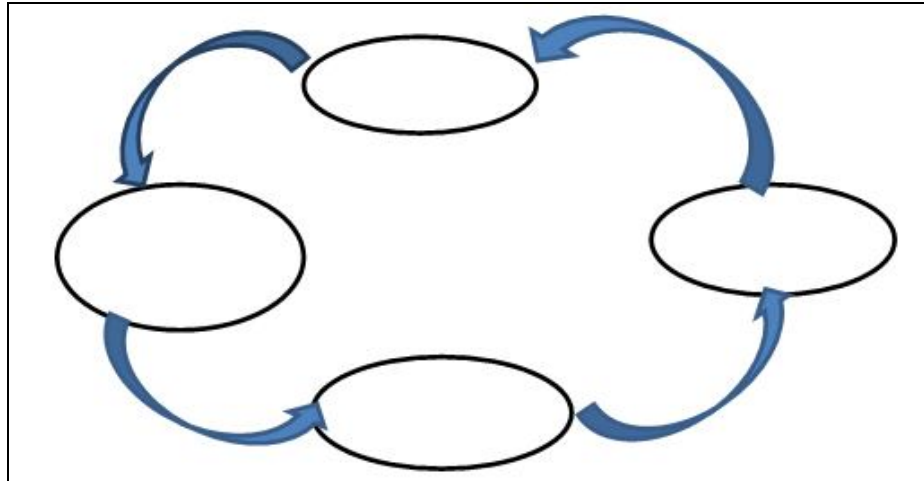


Figure 1: Working Capital Cycle

Therefore this paper focuses on evaluating the impact of working capital management on a firm's performance in terms of return on equity of manufacturing firms listed on Nairobi Securities Exchange NSE and to identify principle variables that influence working capital management efficiency.

## 2.Literature Review

Ebrahim L. Zahra M. &Azam J. (2012) in their research paper on the Relationship between working capital management and firm characteristics for firms listed on Tehran stock exchange using Stepwise Regression analysis found a significant positive relationship between working capital management and firm size ( $\text{sig} = .000$ ). The results also showed a negative and significant relationship between working capital management and leverage ( $\text{sig} = .002$ ).

Adeel M, Muhammad R, Muhammad R, Farhan M, &Atif J (2012) found that NDR (no. of day's receivables) has an inverse relationship with ROA (-0.0693), if NDR increased, the ROA decreased and if NDR decreased, the ROA is respectively increased. There is a positive relationship between ROA and NDI (number of day's inventories) 0.0145 if inventories increase then ROA increased and if NDI decreased then ROA is decreased. There is a positive relationship between the size of the firm with ROA (6.7187). If the short term assets or long term assets decreased firm size is also decreased. Leverage showed a negative relationship -0.0013 to profitability for Chemical sector listed firms on Karachi stock exchange.

Abdul R. Talat A. Abdul Q. & Mahmood A. (2010) researched on Working Capital Management and Corporate Performance of Manufacturing Sector in Pakistan. The results showed that Inventory Turnover in Days (ITID) has a significant negative impact on Net Operating Profitability (P-value = 0.0000). This implies that profitability can be improved by reducing the Inventory Turnover in Days or by keeping inventory for a lesser time can improve profitability.

Cash Conversion Cycle had a negative relationship between Cash Conversion Cycle (a comprehensive measure of working capital management) and corporate profitability where the coefficient is negative and highly significant. It is consistent with the view that decreasing the Cash Conversion Cycle will generate more profits for the company. It also implies that firms can create value for their shareholders by keeping the Cash Conversion Cycle to a minimum. Kesseven P. (2006) found a highly significant relationship is found between ROTA and number of days accounts receivable (p-value = 0.032), which implies that an increase in the number of days accounts receivable by 1 day is associated with a decrease in profitability by 0.04%. The coefficient for accounts payable days was negative and confirms the negative correlation between profitability and the number of days accounts payable. The coefficients of the other variables included in the model were significant, except for financial debt and working capital financing. The firm's profitability as measured by ROTA increases with firm's size, gross working capital efficiency, and with a lesser aggressiveness of asset management for Mauritian Small Manufacturing Firms.

Mian S. & Talat A. (2009) in their paper found a positive coefficient 0.158 of total current liability to total asset TCA/TA which indicated a negative relationship between the degree of aggressiveness of investment policy and return on assets for Karachi Stock Exchange (KSE) firms. As the TCA/TA increases, the degree of aggressiveness decreases, and return on assets increases. Therefore, there is a negative relationship between the relative degree of aggressiveness of working capital investment policies of firms and both performance measures, i.e., ROA and Tobin's q. This similarity in market and accounting returns confirms the notion that investors do not believe in the adoption of an aggressive approach in the working capital management, hence, they do not give any additional weight to the firms on KSE also the negative value of beta coefficient -0.171 for TCL/TA also points out the negative relationship between the aggressiveness of working capital financing policy and return on assets. The higher the TCL/TA ratio, the more aggressive the

financing policy, that yields negative return on assets. However, surprisingly, the relationship between Tobin's q and working capital financing policy has been established as positive and statistically significant. Investors were found giving more weight to the firms which are adopting an aggressive approach towards working capital financing policy and having higher levels of short-term and spontaneous financing on their balance sheets.

Muhammad U. (2012) research on food sector of (KSE) Karachi Stock Exchange the finding reveals that ratio of financial asset to total asset is positively correlated and accurately significant which means that as the ratio of financial asset to total asset increased firm's profitability will raise. Firm size was also accurately significant and positively affecting firm's profit which means that firm with greater sales volume are more profitable in this sector. Whereas average collection period is also significant but negatively correlated which means that as the firm's collection period increase firm will bear loss so firms in this sector should try to reduce their collection period.

Singh D.(2011) analyzed working capital management efficiency of the firms from cement industry in India. Coefficient for inventory turnover in days is 0.203, and the p-value is 0.019 which is significant at 5% level. That means there is a positive relationship between inventory turnover and return on capital employed. The findings showed negative correlation coefficient 0.257 for days' inventory outstanding at 1% significance level with  $p=0.003$ . Therefore there exists a negative relationship between days' inventory outstanding and profitability of the firm. The table shows a negative correlation coefficient -0.177 and the p-value is 0.043 which is significant at 5% level. This implied that day's payable outstanding is negatively related to profitability. Correlation coefficient for sales to total asset ratio is 0.427 and the p-value is 0.000 which means that sales to total asset ratio is positively related to profitability at 1% significant level.

For Turkey firms the regressions result between independent and control variables with dependent variable, profitability indicate that the coefficient of accounts receivable was negative. This means increase or decrease in average collection period significantly affect the firm profitability. total liabilities / total assets ratio used as a proxy of leverage showed negative relationship with the dependent variable, which means that, when leverage of the firm decreases, it will positively affect its profitability. Cash conversion cycle (CCC) as a proxy of working capital management had a negative and significant coefficient. Thus, the lower the cash conversions cycle the higher the profitability of the firm.(Gamze V,Ahmet G, &Emin H. 2012)

Ebrahim M. &Datin J.(2012). The results of showed a highly negative relationship between cash conversion cycle and return on assets in both pooled OLS (P-value- 0.0001 ) and fixed effect estimation (P-value 0.0000). and a negative and highly significant relationship (P-value 0.000) between receivable collection period and return on assets. The results also found a strong negative relationship between inventory conversion period and firm's profitability (P-value 0.0043 & 0.0006) and point out that increasing the length of inventory turnover by one day is accompanied with the decreasing in return on assets by 0.01 % according to OLS and 0.02 % according to fixed effect estimation. Moreover, the coefficient of the payable deferral period was negative and significant in both regression modes. The results of all regression models in both pooled OLS and fixed effect estimation suggested that managers can increase firm profitability by decreasing the length of receivables collection period and inventory conversion period. The OLS regression estimation in all models point out a strong evidence of a negative relationship between working capital management and return on assets. The regression coefficients of control variables in all models are highly significant. Return on assets increases with size of the firms as measured by natural logarithm of assets in both OLS and fixed effect estimation. In addition, return on assets increases with GDP rate and firm's growth. However, a negative and highly significant relationship between debt ratio and firms profitability was found.

IlutaA. & Svetlana I.(2013) found that for Latvian manufacturing enterprises. the strongest correlation was observed between GOP and ACP ( $r=0,456$ ). The direct significant correlations between ROA and size ( $r=0,277$ ), ROA and DR ( $r=0,527$ ) were observed as well. Between ROA and ACP ( $r=-0,298$ ), ROA and CR ( $r=-0,339$ ), significant correlations were reversed. Analysis also shows a positive relationship between Log of Sales, used to measure the size of a company, and the GOP and ROA. Its correlation coefficient accordingly is 0,283 and 0.277. It is highly significant at  $\alpha = 1\%$ . The CR, in the analysis, has a significant negative relationship with ROA. The coefficient is -0,339 (significant at  $\alpha = 1\%$ ). It reveals the need for balance between CR and profitability because these two objectives have an inverse relationship. Based on the research data it can be concluded that companies have to deal with problems of management of receivables and inventory seriously because they have an essential impact upon profit indicators.

For firms listed in the Cyprus Stock Exchange the results show that days in inventory (STOCK) is inversely related to profitability. The sales growth had a positive coefficient with the ROA, meaning that growth leads to increase in profitability. Also, as expected, high leveraged firms (DEBT) are less profitable due to the fact that these firms have higher default risk. The ACP variable is negatively related to profitability. The results also show that ROA days payable (CREDITOR) is inversely related to profitability, meaning that less profitable firms take longer to repay their obligations, the cash conversion cycle is inversely related to profitability(Melita S.2010)

### 3.Methodology

This chapter explains the methodology used for analysing impact of working capital management on a firm's performance during the period 2007 to 2011. Working capital variables

Include average payment period APP that measures the length of time to pay suppliers. If too high there is a risk of the supplier not extending credit or may indicate insolvency problems.

Average collection period ACP measures the time taken for customers to pay, normal credit period is 30 days changes may be due to improving or worsening credit control. Inventory turnover ITO shows how quickly the inventory is sold, the higher the ratio the quicker the inventory is sold. Cash conversion cycle CCC shows the time lag between expenditure for purchases of raw material and collection of cash from sales. Other variables that have been included which may influence the performance of a firm natural log of sales NLS that measure firms size, the financial debt ratio FDR, Current liability to total asset ratio CLTA, to measure the degree of aggressive financial policy. Fixed financial ratio FATA, Sales growth SG, Current ratio CR, Current assets to total assets ratio CATA, Gross working capital turnover ratio NSCA.

### 3.1. Variables

<b>Independent variables</b>		<b>Symbol</b>
Average collection period	Debtors x 365 days Sales	ACP
Average payment period	Creditors x 365 days Purchases	APP
Inventory turnover	Inventory x 365 days cost of sales	ITO
Cash conversion cycle	(ACP + ITO) - APP	CCC
<b>Control variables</b>		
Financial debt ratio	Total debts Total assets	FDR
Fixed financial ratio	Fixed assets Total assets	FATA
Sales growth	Current yr sales- last yr sales Last yr sales	SG
Firms size	Natural logarithm of sales	NLS
Current ratio	Current assets Current liability	CR
Current assets to total assets ratio	Current assets Total assets	CATA
Current liability to total asset ratio	Current liability Total assets	CLTA
Gross working capital turnover ratio	Net sales Current assets	NSCA
<b>Dependent variable</b>		
Return on equity	Net income (profit after tax) Equity	ROE

Table 1

### 3.2. Data And Sample Selection

In this study, the researchers used manufacturing companies listed on the Nairobi Securities Exchange (NSE) for the period from 2007 to 2011. This sample includes manufacturing firms whose corporate financial reports during the period 2007-2011 were present and also performed operations during this time period. All the 20 manufacturing firms whose financial statements for the period 2007- 2011 were used in this study. The data of 20 selected firms was extracted from their annual reports which were obtained from Nairobi Securities Exchange NSE website and others were collected from the websites of the firms.

### 3.3. Methods Of Data Analysis

In order to obtain the research results that are reliable two methods were used this include main component analysis and multiple regression analysis. The basic principle of main component analysis consists in reducing the number of variables analysed, by replacing them with two or three latent variables, eliminating Co linearity and also facilitating the analysis. Thus, starting from a variety of baseline variables,  $X_i$  ( $i = 1 \dots n$ ), new variables are determined, named factors or components of the form  $C_j$  ( $j = 1 \dots m$ ), where  $C_j = b_{j1}X_1 + b_{j2}X_2 + \dots + b_{jn}X_n$  and  $m \leq n$ , the main components determined by linear combination of the original variables that are independent of each other. (Tanasă F. Horomnea E. & Ungureanu S. 2012)

#### 4. Analysis

##### 4.1. Principal Components Analysis (PCA)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.520
Bartlett's Test of Sphericity	Approx. Chi-Square	207.922
	Df	78
	Sig	.000

Table 2

Table 2 presents the results of a Kaiser-Meyer-Olkin (KMO), Bartlett's test of sphericity. Kaiser-Meyer-Olkin (KMO) is a measure of sampling adequacy used to examine the appropriateness of the use of factor analysis (Hair et al. 2006). Specific to this method of analysis is the assumption of independence of the main components that can be validated by several tests, including:  $\chi^2$  test statistic (for testing a connection between variables) and the KMO statistic (Kaiser-Meyer-Olkin, to determine the intensity of this link) (Tanasă F. Horomnea E. & Ungureanu S. 2012). A range of 0.5 – 1.0 in KMO indicates the use of factor analysis is appropriate. The KMO value of 0.520 signified that factor analysis was appropriate to be used in this analysis. Considering Bartlett's test of sphericity the chi-square value is 207.922 with a p value of .000 which is significant at 99% confidence this shows that all items on each scale were correlated. Bartlett's test of sphericity assumes that all values are uncorrelated.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.980	30.617	30.617	3.980	30.617	30.617
2	3.411	26.240	56.857	3.411	26.240	56.857
3	1.818	13.982	70.838	1.818	13.982	70.838
4	1.361	10.466	81.304	1.361	10.466	81.304

Table 3: Total Variance Explained

The principal components analysis performed extracted four factors having eigenvalues greater than 1.0. These factors (1 to 4), represented 13 of the items and accounted for 81.304 % of the total variance. It is common to consider a solution that accounts for about 60%. (Hair et al. 2006). The factor loadings of the extracted sums of square loadings have values greater than 0.5 while all others have values less than 0.5.

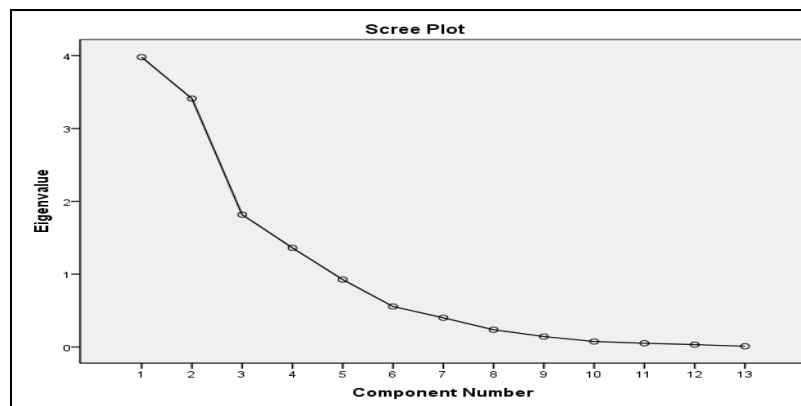


Figure 2

The scree plot Figure 2 shows the eigenvalue associated with each component. Eigenvalue represents the variance explained by each component. The scree also confirms that there are 4 principal factors that this analysis has extracted for this research

Rotated Component Matrix <sup>a</sup>				
	Component			
	1	2	3	4
ACP	.121	.900	-.230	-.253
APP	-.092	.142	.031	.933
CATA	.936	-.127	-.044	-.218
CCC	-.155	.867	.025	.354
CLTA	-.885	-.201	-.016	-.136
CR	-.422	-.443	-.223	-.224
FATA	.925	-.144	-.074	-.185
FDR	.858	.123	-.257	.042
ITO	-.383	.649	.256	-.040
NLS	.218	.783	-.009	.302
NSCA	.177	.575	.475	-.447
SG	-.317	-.136	.772	-.340
ROE	-.028	.106	.863	.266
Extraction Method: Principal Component Analysis.				
Rotation Method: Varimax with Kaiser Normalization.				
a. Rotation converged in 5 iterations.				

Table 4: Rotated Component Matrix

Factor 1 comprised of three items ( CATA,FATA, & FDR) as principal extracted components explaining 30.617% of the total variance. Factor 2 has four items ( ACP,CCC,ITO, NLS, &NSCA)explaining 26,24 % of the total variance factor 3 has ( SG & ROE)explaining 13.982% of the total variance and factor 4 has APP explaining 10.466% of the total variance. we should take knowledge of the fact that only eigenvalues greater than one are of interest because only the principal components with higher variance than the standardized original variables should be evidenced hence we proceed to undertake regression analysis of the principle components.

#### 4.2. Multiple Regression

The second tool to analyze the data above is to use multiple linear regression based on data extracted from financial statements for 2007-2011 the model has the following form:

$$Y = \alpha + \beta_1 ACP + \beta_2 APP + \beta_3 ITO + \beta_4 CCC + \beta_5 FATA + \beta_6 CR + \beta_7 NSCA + \beta_8 SG + \beta_9 CLTA + \varepsilon$$

Where Y is the performance proxy return on equity ROE as dependent variable and  $\beta_1 \beta_2 \beta_3 \beta_4 \beta_5 \beta_6 \beta_7 \beta_8 \beta_9$  are regression co-efficient  $\varepsilon$  is the error term.

Coefficients <sup>a</sup>							
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Constant)	-17.717	13.787		-1.285	.228		
ACP	-1.011	.349	-.967	-2.896	.016	.173	5.797
APP	.247	.366	.178	.675	.515	.276	3.623
ITO	-.287	.401	-.204	-.717	.490	.238	4.198
CCC	1.068	.454	.964	2.354	.040	.115	8.704
FATA	.612	.227	.768	2.690	.023	.236	4.231
CR	-.529	.248	-.464	-2.134	.059	.408	2.454
NSCA	.636	.233	.641	2.733	.021	.350	2.860
SG	.371	.331	.287	1.122	.288	.294	3.403
CLTA	.940	.353	.847	2.663	.024	.190	5.253

Table 5: Regression Coefficients

Based on the data in Table no 5 (Coefficients), we can obtain the estimated equation of the linear Multiple regression model for ROE as  $Y = -17.717 - 1.011ACP + .247APP - .287 ITO + 1.068CCC + .612FATA - .529CR + .636NSCA + .371SG + .940 CLTA$

When Durbin-Watson factors are between (1) and (3) there is no autocorrelation problem (Alsaeed, 2005) from Table 6 the Durbin Watson value is 1.627 hence there is no autocorrelation problem on the regression model. Also there is no multicollinearity problems as the VIF values are < 10. According to Besley 1980 as sighted in (jingyu li 2003) researchers have used VIF= 10 as critical value rule

of thumb to determine whether too much correlation, this can be also seen as the tolerance values are  $< 1$ . The t values from the table show that working capital proxies CCC has a positive value this is inconsistent to (Abdul et al 2010, Ebrahim and Dating 2012) who found it to negatively correlated for Tehran and Pakistan firms respectively. ACP was negatively correlated to performance this is consistent to (Melita 2010, Iluta and Svetlana 2013) control variables CLTA was positive this is inconsistent with (Mian & Talat 2009) who found it to be negative to performance for Karachi firms. & FATA was found to be positive, this was consistent with (Mian & Talat . 2009). All the above factors are significant at 95% confidence ( $p < .05$ ) to performance as measured by ROE.

Model	R	R Square	Std. Error of the Estimate	Change Statistics					Durbin Watson
				RSquare Change	F Change	df1	df2	Sig. F Change	
1	.899	.808	3.50149	.808	4.661	9	10	.012	1.808

Table 6: Model Summary

a. Predictors: (Constant), FATA, ACP, APP, CR, ITO, NSCA, SG, CLTA, CCC  
b. Dependent Variable: ROE

The Anova table shows that the regression model can be used to explain the impact of working capital on performance as F value is 4.223 and the p value  $< .05$  indicating that its significant at 95% confidence level. The value of R square is .824 this indicate that the independent variables can explain 82.3 % of variance in the dependent variable

## 5. Conclusion

From the results using PAC and multiple regression the t values from the table show that the working capital proxies CCC, ACP and control variables CLTA, NSCA & FATA are significant at 95% confidence ( $p$  values are  $< .05$ ) To performance as measured by ROE. This indicates that CCC and ACP are the main determinants proxies of working capital that determine the performance of manufacturing firms on NSE. The control variables CLTA, NSCA & FATA also affect the performance of firms hence the above factors are vital for managers and investors as consideration for performance of firms.

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