Effects of Working Capital Management Practices on Profitability of Construction Firms Listed in Nairobi Securities Exchange, Kenya

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Abstract

The construction industry in Kenya is a major Gross Domestic Product contributor as well as a key pillar in the creation of employment. Due to increased demand for improved road networks, dams, civil infrastructure, residential and commercial establishments, the industry has experienced exponential growth over the last few years. The Kenyan government had registered and licensed at least 300 construction firms by the end of 2014(Kenya National Bureau of Statistics 2014). With subsequent growing competition among the firms, it is important for the companies to ensure financial gains. The purpose of this study was to determine the effects of working capital management on the profitability of the construction firms. It was be guided by the following objectives: to assess the degree to which cash management practices influence profitability of construction companies at Nairobi Securities Exchange, to analyze the degree to which accounts payable practices influence profitability of construction firms at Nairobi Securities Exchange, to measure the degree to which accounts receivable practices impact the profitability of construction companies listed on Nairobi Securities Exchange, and to determine the degree to which Inventory management influence profitability of construction companies listed on Nairobi Securities Exchange .Descriptive and correlational research designs were used in the research process. Since only five firms comprised the population, census sampling technique was used that involved all the population in the research study. The research tools were record survey sheet and questionnaire. Data obtained was analyzed using trend analysis charts, cross sectional data analysis techniques and regression analysis. The results obtained indicated that only the cash management practices had a significant effect on profitability while the accounts payable, accounts receivable, and inventory did not have a significant impact based on regression analysis conducted. However, this study was not able to exhaust all working capital management components that have effects on profitability in construction firms. Therefore, effects of prepayments, accrued expenses, government regulations and policy, economic environment and culture on the profitability of construction firms need be established in future studies.
Keywords: Construction Industry in Kenya, Effects of Working Capital Management Practices

I. INTRODUCTION

A. Background Information

The construction industry is one of the most complex and multipurpose economic sectors. Its value added chain encompasses activities which include the production of raw materials and processed goods (ranging from simple sand extraction, wood processing and woodworking, to the manufacture of cement and steel, to metal products, such as fixtures), civil and heavy construction works, as well as project engineering, development and management (Bakar,2009).

The construction industry holds great potential for broad-based growth, employment generation, capital formation and technological development. Through its strong dependence on backward and forward linkages, it stands as a foundation for stimulating structural changes and sustaining the development of other sectors, including agriculture and forestry, among others (Ofori, 2007). According to the World Bank's 1984 report entitled "The Construction Industry: Issues and Strategy in Developing Countries", the industry is also crucial for aggregate savings as a result of its contribution to the building of the physical stock of capital. The construction industry may be considered under the global, regional and local perspectives.

B. Specific Objectives of the Study

− To assess the degree to which cash management practices affect the profitability of construction companies listed on NSE.
− To analyze the degree to which accounts payable practices affect the profitability of construction companies listed on NSE.
− To measure the degree to which accounts receivable practices impact the profitability of construction companies listed on NSE.
− To determine the degree to which Inventory management practices affect the profitability of construction companies listed on NSE.

II. LITERATURE REVIEW

A. *Theoretical Literature: Theories of Financial Management*

In working capital management practices, there are three main approaches used to choose the mix of long and short term funds for financing the working capital of the firm. They include; Conservative, Aggressive and Hedging (Maturity Matching) Approach.

1) *Hedging (Maturity Matching) Theory*

This is a meticulous strategy of financing the working capital with moderate risk and profitability. In this strategy, each of the assets would be financed by a debt instrument of almost the same maturity. It means if the asset is maturing after 30 days, the payment of the debt which has financed it will also have its due date of payment after almost 30 days. Hedging strategy works on the cardinal principle of financing i.e. utilizing long-term sources for financing long-term assets i.e. fixed assets and a part of permanent working capital and temporary working capital is financed by short-term sources of finance.

Thus;

Long Term Funds will Finance= FA +PWC
Short Term Funds will Finance = TWC

2) *Conservative Theory*

As the name suggests, it is a conservative strategy of financing the working capital with low risk and low profitability. In this strategy, apart from the fixed assets and permanent current assets, a part of temporary working capital is also financed by long-term financing sources. It has the lowest liquidity risk at the cost of higher interest outlay.

Long Term Funds will Finance = FA + PWC + Part of TWC
Short Term Funds will Finance = Remaining Part of TWC

3) *Aggressive Theory*

This strategy is the most aggressive strategy out of all the three. The complete focus of the strategy is in profitability. It is a high-risk high profitability strategy. In this strategy, the dearer funds i.e. long term funds are utilized only to finance fixed assets and a part of the permanent working capital. Complete temporary working capital and a part of permanent working capital also are financed by the short-term funds. It saves the interest cost at the cost of high risk.

Long Term Funds will Finance = FA+Part of PWC
Short Term Funds will Finance = Remaining Part of PWC + TWC

However, the main difference between these approaches is the trade-off between the risk and profitability. Furthermore, the other remarkable difference is the proportion of application of long and short term fund to finance the working capital. Thus, since the working capital directly influences the liquidity of the company, it is prudent for the construction company to devise the best approach to funding the working capital.

B. *Conceptual Framework*

With regard to the existing and new knowledge, the aforementioned theories provide a conceptual framework, so that knowledge can be interpreted for empirical application in a comprehensive manner. In this study, the conceptual framework comprises of four independent.
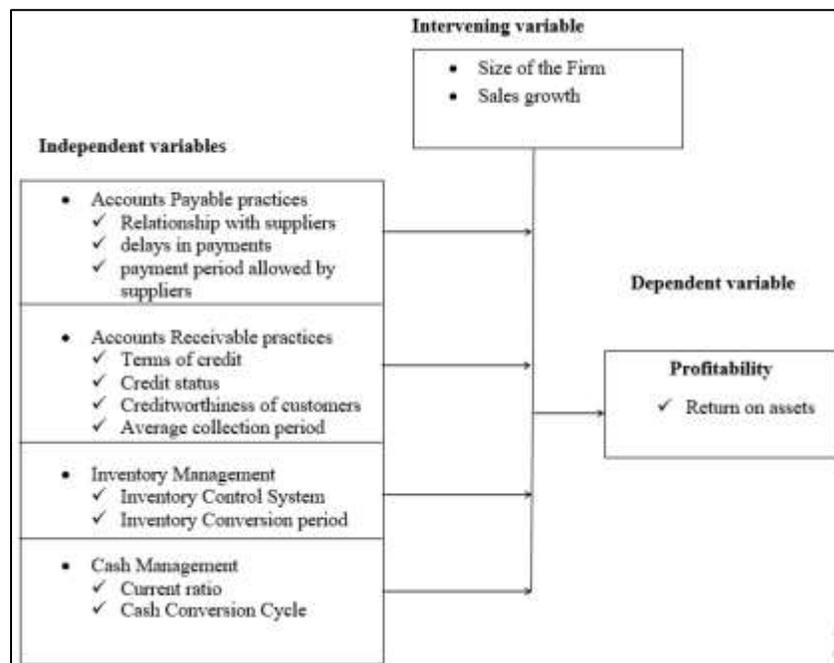

Fig. 1: Conceptual Framework (Source: Author (2017))

C. Company Background Information

Table - 1
Firms' Background Information

	AthiRiver Mining	Bamburi Cement	E. A. Cables	E.A.P.C.C	Crown Paints
Commence operations	41-50 years	More than 50 years	41-50 years	More than 50 years	More than 50 years
Time listed on NSE	16 – 20 years	More than 15 years	More than 15 years	More than 15 years	More than 10 years
Number of workers	More than 500	More than 500	More than 500	More than 500	More than 500
Products	Raw Materials	Raw Materials	Finished Goods	Raw Materials	Finished Goods
Organizational Structure	Matrix	Divisional	Matrix	Functional	Divisional

This data was mainly qualitative and collected using the questionnaire. Based on the background information provided by the five firms, Athi River Mining Limited and East African Cables have been in operation for between 41 and 50 years having being incorporated in 1974 and 1967 respectively. The other firms including Bamburi Cement, East African Portland Cement Company, and Crown Paints Limited had been in operation for over 50 years.

D. Accounts Payable Practices

Table - 1
Accounts Payable Policies

	Statement	Response				
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	The firm receives credit facilities from its suppliers	5	0	0	0	0
2	The firm receives cash discounts from its suppliers upon payment within a stipulated period of time	0	0	1	2	2
3	The firm is sometimes charged an interest by its suppliers for late payment	0	1	3	1	0
4	The firm's past debts have ever been waived by its suppliers	4	1	0	0	0
5	The firm is sometimes unable to pay its suppliers on time	0	2	3	0	0
6	The payment period allowed by your suppliers to your firm is reasonable	4	1	0	0	0

There was general agreement among the five (5) respondents that the companies received credit facilities from suppliers, the payment period offered by the suppliers was reasonable and that the companies received cash discounts from the suppliers. On the other hand, one (1) respondent remained neutral on whether the company was unable to pay supplier dues on time, two (2) of them disagreed with the statement, while the other two (2) strongly disagreed that their companies were unable to pay suppliers on time.

E. Inventory Control Practices

Table - 2
Inventory Control Policies

	Statement	Responses				
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	The firm has a defined level of inventories for raw materials	5	0	0	0	0
2	The firm has determined optimal batch sizes	5	0	0	0	0
3	The firm reviews inventory levels periodically	5	0	0	0	0
4	The firm keeps accurate inventory records	5	0	0	0	0
5	The firm has installed an inventory control system	5	0	0	0	0

Owing to the fact the five construction firms listed on the Nairobi Securities Exchange deal with the delivery of raw materials and finished goods, inventory management is at the core of operations. As such, it emerged that all the 5 respondents from the respective companies strongly agreed with the statements included in the segment. The interpretation of the above was that inventory was taken seriously by the construction firms listed in NSE. Hence through regression analysis to determine the effects of Inventory management practices of ROA.

F. Liquidity Management Practices

Table - 3
Liquidity Management Practices

	Statement	Responses				
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Current assets are maintained at a higher level than the current liabilities	4	0	0	1	0
2	Inventories constitute a large position of the total current assets	4	1	0	0	0
3	Cash and marketable securities are maintained at a higher level than the current liabilities	0	0	1	2	2
4	Liquidity ratios are maintained at optimal level	0	1	4	0	0
5	The firm always prepares a cash budget	4	1	0	0	0

6	*The firm has an optimum cash balance policy*	4	1	0	0	0

Six items were considered under liquidity management practices. There was agreement by the five respondents with the statement that their respective companies maintained an optimum cash balance policy and that the companies prepared cash budgets. There was also a similar outcome since 4 of the respondents strongly agreed that their companies' inventory formed a large proportion of the total assets of the company while only 1 registered agreed status.

G. *Quantitative Analysis*

This section looks at the descriptive and inferential statistics of the variables of interest that include return on assets, the cash at bank and at hand, accounts receivable, accounts payable, and inventory. The descriptive statistics will include mean, standard deviation, and skewness. The inferential statistics will comprise of the correlation and regression analysis.

H. *Descriptive Statistics*

First, the descriptive statistics of the independent variables were obtained and are represented in the table below.

Table - 4
Descriptive Statistics for Independent Variables

	Min	*Max*	*Mean*	*Std. Dev*	*Skewness*
Accounts Receivable	.53	3.75	1.5661	.83927	.865
Inventory	.66	5.61	2.1493	1.66605	1.064
Cash at Bank and Hand	.02	8.88	1.7246	3.22339	1.632
Accounts Payable	.49	6.41	2.2582	1.82220	1.221

Accounts receivable across the five firms had a mean of 1.57 billion with a standard deviation 0.84 billion (M = 1.57, SD = 0.84). This means that some of the companies had very large accounts receivable while others had very little with the largest having accounts receivable worth 3.75 billion and the smallest having accounts receivable of 0.53 billion. The skewness of the accounts receivable was 0.87, indicating that the distribution can be considered to be relatively symmetrical and hence normally distributed. According to Kothari (2004), skewness that ranges from -1 to +1 is considered to be relatively normal. With regard to the inventory, the companies had an average of inventory worth 2.15 billion with a standard deviation of 1.67 billion over the period between 2010 and 2014 (M = 2.15, SD = 1.67). The minimum inventory was 0.66 billion while the maximum inventory was 5.61 billion. The skewness for inventory was close to 1 since it was 1.1 (1 d.p), therefore, the distribution of the variable can be considered to be slightly skewed to the right. Concerning the cash at bank and at hand, the greatest standard deviation was registered as well as the skewness (M = 1.72, SD = 3.22). The mean value was about 1.72 billion

Table - 5
Descriptive Statistics for Dependent Variable

	Min	*Max*	*Mean*	*Std. Dev*	*Skewness*
Return on Assets	-6.96	24.89	7.5777	7.16578	.366

The minimum return on assets was -6.96 percent with the maximum being 24.89 percent. The mean value was 7.58 percent with a standard deviation of 7.17 percent (M = 7.58, SD = 7.17). The skewness of the distribution is relatively symmetrical since the magnitude is between -1 and +1 (Kothari, 2004).The mean being close to the standard deviation, mean of 7.58

Table - 6
Summary model for relationship between cash and ROA

R	*R Square*	*Adjusted R Square*	*Std. Err*
.486	.236	.203	6.39862

First, the correlation coefficient between cash and return on assets was found to be significant (r = 0.49, p < 0.05). This implies that there is a positive and significant linear relationship between the two variables. Additionally, the coefficient of determination (r-sq. = 0.24) implies that cash at bank and in hand explains about 24 percent of the variability observed in return in assets.

Table - 7
ANOVA table for relationship between cash and ROA

Model	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Regression	290.689	1	290.689	7.100	.014
Residual	941.672	23	40.942		
Total	1232.361	24			

The model that is developed as the fit for the relationship is adequate (F = 7.10, p < 0.05). Therefore, there is sufficient evidence to reject the null hypothesis and conclude that cash at hand and bank has a significant effect on return on assets for construction companies listed on the NSE at 5 percent level of significance.

The table below is the regression coefficients table.

Table - 8
Regression Coefficients Table

Model	*Coefficients*		*t*	*Sig.*
	B	*Std. Error*		
(Constant)	5.716	1.458	3.920	.001
Cash at Bank and Hand	1.080	.405	2.665	.014

Based on the information contained therein, it is clear that the coefficient of cash at bank and at hand is distinguishable from zero and therefore a significant predictor ($\beta = 1.08$, $t = 2.67$, $p < 0.05$) as indicated by Kazmier (2005). Therefore, it is plausible to conclude that increasing the cash at hand and at the bank by 1 billion, the return on assets would increase by 1.08 percent. The regression equation is therefore:

$$ROA = 5.716 + 1.080 \; cash$$

I. Hypothesis Two

− H_{02}: Accounts Payable practices have no significant effect on the profitability of construction companies listed on NSE
The following results were obtained. First, the correlation coefficient between accounts payable and return on assets was found to be insignificant ($r = 0.34$, $p > 0.05$). This implies that there is a positive but insignificant linear relationship between the two variables. Additionally, the coefficient of determination (r-sq. = 0.118) implies that accounts payable explain about 11.8 percent of the variability observed in return in assets.

Table - 9
Summary model for relationship between Accounts Payable and ROA

R	R Square	Adjusted R Square	Std. Err
.343	.118	.079	6.87615

First, the correlation coefficient between accounts payable and return on assets was found to be insignificant ($r = 0.34$, $p > 0.05$). This implies that there is a positive but insignificant linear relationship between the two variables. Additionally, the coefficient of determination (r-sq. = 0.118) implies that accounts payable explain about 11.8 percent of the variability observed in return in assets.

Table - 10
ANOVA table for relationship between Accounts Payable and ROA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	144.888	1	144.888	3.064	.093
Residual	1087.473	23	47.281		
Total	1232.361	24			

The model that is developed as the fit for the relationship is inadequate ($F = 3.06$, $p > 0.05$). Therefore, there is insufficient evidence to reject the null hypothesis and hence conclude that accounts payable do not have a significant effect on return on assets in construction firms listed on the NSE at 5 percent level of significance.

Table - 11
Regression Coefficients Table

Model	Coefficients		t	Sig.
	B	Std. Error		
(Constant)	4.533	2.217	2.044	.053
Accounts Payable	1.348	.770	1.751	.093

The table above is the regression coefficients table. Based on the information contained therein, it is clear that the coefficient of accounts payable is not statistically distinguishable from zero and therefore not a significant predictor ($\beta = 1.35$, $t = 1.75$, $p > 0.05$).

So accounts payable for the listed construction firms have no effects on the profitability of the firms' .Hence the firms can use other policy measures to improve on profitability other than the accounts payable.

Table - 12
Summary model for the relationship between accounts receivable and ROA

R	R Square	Adjusted R Square	Std. Err
.092	.009	-.035	7.28867

The correlation coefficient between accounts receivable and return on assets was found to be insignificant ($r = 0.09$, $p > 0.05$). This implies that there is a positive but insignificant linear relationship between the two variables. Additionally, the coefficient of determination (r-sq. = 0.009) implies that accounts receivable explain about 0.9 percent of the variability observed in return in assets.

Table - 13
ANOVA Table for the relationship between Accounts receivable and ROA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	10.492	1	10.492	.198	.661
Residual	1221.869	23	53.125		
Total	1232.361	24			

The model that is developed as the fit for the relationship is inadequate ($F = 0.198$, $p > 0.05$). Therefore, there is insufficient evidence to reject the null hypothesis and hence conclude that accounts receivable do not have a significant effect on return on assets in construction firms listed on the NSE at 5 percent level of significance.

The table below is the regression coefficients table.

Table - 14
Regression Coefficients Table

Model	Coefficients		t	Sig.
	B	Std. Error		
(Constant)	6.344	3.136	2.023	.055
Accounts Receivable	.788	1.773	.444	.661

Based on the information contained therein, it is clear that the coefficient of accounts receivable is not statistically distinguishable from zero and therefore not a significant predictor ($\beta = 0.79$, t

J. Hypothesis Four

− H_{04}: Inventory management practices have no significant effect on the profitability of construction companies listed on NSE
The following results were obtained.

Table 15: Summary model for the relationship between inventory and ROA

R	R Square	Adjusted R Square	Std. Err
.295	.087	.048	6.99322

The correlation coefficient between inventory and return on assets was found to be insignificant ($r = 0.30$, $p > 0.05$). This implies that there is a positive but insignificant linear relationship between the two variables. Additionally, the coefficient of determination (r-sq. $= 0.09$) implies that inventory explains about 9 percent of the variability observed in return in assets.

Table - 16
ANOVA table for the relationship between inventory and ROA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	107.542	1	107.542	2.199	.152
Residual	1124.819	23	48.905		
Total	1232.361	24			

The model that is developed as the fit for the relationship is inadequate ($F = 2.20$, $p > 0.05$). Therefore, there is insufficient evidence to reject the null hypothesis and hence conclude that inventory does not have a significant effect on return on assets in construction firms listed on the NSE at 5 percent level of significance. The table below is the regression coefficients table.

Table - 17
Regression Coefficients Table

Model	Coefficients		t	Sig.
	B	Std. Error		
(Constant)	4.847	2.312	2.096	.047
Inventory	1.271	.857	1.483	.152

Based on the information contained therein, it is clear that the coefficient of inventory is not statistically distinguishable from zero and therefore not a significant predictor ($\beta = 1.27$, $t = 1.48$, $p > 0.05$). However, the intercept was significant ($\beta = 4.85$, $t = 2.10$, $p < 0.05$), implying that even without inventory, the return on assets can still increase by about 4.85 percent. Therefore, the equation associated with the model is:

$$ROA = 4.847 + 1.271 \text{ inventory}$$

Us components of working capital have on the profitability of the business especially with regard to returning on asset.

variable	R-Sq	F	Reg. Coef
Cash	0.236	7.100*	1.080*
Accounts Payable	0.118	3.064	1.348
Accounts Receivable	0.009	0.198	0.788
Inventory	0.087	2.199	1.271

* Significant at 0.05 level of significance
The table above shows the main research findings on the components of working capital.

K. Discussion of Findings

Based on the results in it is evident that the four independent variables; inventory, account receivable, account payable and cash, have a positive relationship with return on assets. However, only the relationship between the return on asset and cash had a significant relationship. The other three independent variables had a positive relationship with ROA though their relationship was not significant. In general, the results implied that effective working capital management practices have a significant impact on the profitability of the construction companies. This section focuses on the findings in formulates conclusions of the study based on the objectives. The data collected from NSE was structured to achieve the objectives under the study.

L. Conclusion

The study examined the relationship between working capital and profitability of construction firms in period 2010-2014.The main aim being to provide empirical insights on the working behavior of listed construction firms in Nairobi Stock Exchange. Most of the Kenyan construction firms have large amounts of cash invested in working capital. It can therefore be expected that the way in which working capital is managed will have a significant impact on profitability of those firms. The study established that there is a positive correlation between Return on Inventory, Accounts Payment Period, Accounts Receivable, and cash. There is clearly an enormous scope for more research that can inform how working capital is structured and how it related to profitability.

M. Recommendation

Based on the results obtained, the following recommendations were made;

First, finance managers of construction firms should regularly review their credit policies to ensure that they are ideal. Ideal credit policies ensure that both sales and profit increase and at the same time minimize the risk of bad debts. They should design credit policies that are capable of helping their firms collect proceeds from debtors as good working capital management urges for quick cash collection from credit sales for quick reinvestment in the short term securities in order to boost profitability.

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