AN ANALYSIS OF WORKING CAPITAL MANAGEMENT EFFICIENCY IN THE SUGAR INDUSTRY: A CASE OF MUMIAS SUGAR

Kung'a Andrew Onyango*

Abstract

Analysis of working capital management efficiency was done on Mumias Sugar Company limited. Panel regression analysis was employed for period covering 2006 to 2011 to find the relationship between working capital management efficiency and profitability and liquidity in the sugar industry. The analysis was done to find statistical evidence to support or reject the two hypotheses. Result for panel regression indicated that profitability is negative but statistically insignificant. Liquidity is negative and statistically significant. This indicates that there is significant impact of Liquidity on working capital management efficiency. Beta coefficients associated with all the variables are statistically significant at 5% level. These variables explain around 84.6 % of variation in working capital management efficiency. The remaining variables incorporated in the model explain only 15.4 % of the variation. These facts conclude that Liquidity play a major role in on working capital management efficiency of the sugar- producing firms, while profitability do a dismal role.

Keywords- ANOVA, correlation, regression, working capital.

* School of Business and Economics, Maseno University, , Maseno, Kenya

1.1 Introduction

Meaning

Working capital management is an act of planning, organizing and controlling the components of working capital like cash, bank balance inventory, receivables, payables, overdraft and short-term loans.

According to **Smith K.V,** "Working capital management is concerned with the problems that arise in attempting to manage the current asset, current liabilities and the interrelationship that exist between them".

According to **Weston and Brigham,** "Working capital generally stands for excess of current assets over current liabilities. Working capital management therefore refers to all aspects of the administration of both current assets and current liabilities".

Working capital management is also one of the important parts of the financial management. It is concerned with short-term finance of the business concern which is a closely related trade between profitability and liquidity. Efficient working capital management leads to improve the operating performance of the business concern and it helps to meet the short term liquidity. Hence, study of working capital management is not only an important part of financial management but also is overall management of the business concern.

Working capital is described as the capital which is not fixed but the more common uses of the working capital is to consider it as the difference between the book value of current assets and current liabilities. It includes maintaining optimum balance of working capital components – receivables, inventory and payables – and using the cash efficiently for day-to-day operations. Optimization of working capital balance means minimizing the working capital requirements and realizing maximum possible revenues. Efficient working capital management increases firms' free cash flow, which in turn increases the firms' growth opportunities and return to shareholders. Even though firms traditionally are focused on long term capital budgeting and capital structure, the recent trend is that many companies across different industries focus on working capital management efficiency.

1.2 Literature review

There is much evidence in the financial literature that present the importance of working capital management efficiency.

Shin, H. H. and Soenen, L. (1998), found that there is statistical evidence for a strong relationship between the firm's profitability and its working capital management efficiency.

Filbeck, G., Krueger, T. M. and Preece, D. (2007), revealed that the measures of working capital management efficiency vary across different industries. The study also gave significant evidence that issues of working capital management are different for different industries and firms from different industry sectors adopt different approaches to working capital management. Firms follow an appropriate working capital management approach that is favorable to their industry. Firms in an industry that has less competition would focus on minimizing the receivable to increase the cash flow. For firms in industry where there are large numbers of suppliers of materials, the focus would be on maximizing the payable.

Myers, R. (2007), found statistical evidence that telecommunication industry showed a wide variation in the working capital management efficiency and there is consistency in the approach of the working capital management within any given industry over a period of time.

The subject of this analysis is about this variation in working capital management efficiency measures and how a working capital management component impacts working capital management efficiency in the telecommunication industry. The analysis is done to get insight into working capital management efficiency in sugar industry and to find the approaches used by the sugar firms to improve on the working capital management efficiency.

1.3 Objectives of the study

The general objective of study is to analyze the working capital management efficiency in the sugar industry

The specific objectives of the study were;

1. To determine the relationship between working capital management efficiency and profitability in the sugar industry.
2. To determine the relationship between working capital management efficiency and liquidity in the sugar industry.

1.4 Research Hypotheses

The study tested the following hypotheses on relation between working capital management efficiency and profitability and liquidity in the sugar industry.

H_{O1}: There is no significant impact of working capital management efficiency on profitability of sugar industry.

H_{O2}: There is no significant impact of working capital management efficiency on liquidity of the sugar industry.

1.5 Measures of Working Capital Management Efficiency

The working capital management efficiency is measured in terms of the "days of working capital" (DWC). DWC value is based on the dollar amount in each of equally weighted receivable, inventory and payable accounts. The DWC represents the time period between purchases of materials on account from suppliers until the sale of finished product to the customer, the collection of the receivables, and payment receipts. Thus it reflects the company's ability to finance its core operations with vendor credit.

Days Working Capital (DWC) = DSO + DIO – DPO

Where,

- Days Sales Outstanding (DSO) = Receivables / (Sales/365)
- Days Inventory Outstanding (DIO) = Inventories / (Sales/365)
- Days Payable Outstanding (DPO) = Payables / (Sales/365)

The firm's profitability is measured using the operating income plus depreciation related to the sales (IS). This indicates the profit margin on sales.

Income to Sales (IS) = (Operating Income + Depreciation)/Sales

To measure the liquidity of the firm the cash conversion efficiency (CCE) is used. The CCE is the cash flow generated from operating activities related to the sales.

Cash Conversion Efficiency (CCE) = (Cash flow from operations)/Sales

2.0 Materials and methods

The study was based on Secondary data sourced from annual reports and accounts of Mumias sugar the period 2006–2011, The Kenya sugar board investment guides and Kenya Sugar Industry Strategic Plan 2010-2014. Two different analytical techniques were employed in the study for the period 2003 to 2010; they included the descriptive statistics and inferential statistics (panel data econometric techniques. Descriptive statistics such as; Mean was used to evaluate some selected variables. Range and Standard deviation were used to determine the degree of variability of the estimates. The study used panel regression model of panel data analysis to

measure the determinants of capital structure of the firms in the sugar industry. The Pearson's correlations were used to establish the degree of relationship between the independent and dependent variables.

2.1 Specification of the Model

The study used the panel regression analysis to measure the relationship between working capital management efficiency and profitability and liquidity in the sugar industry.

A general panel data regression is written as;

$$Y_{it} = \alpha + \beta X_{it} + e_{it} \quad \ldots\ldots (1)$$

With the subscript *i* denoting the cross-sectional dimension and *t* representing the time-series dimension. Y_{it}, represents the dependent variable in the model, which is the firm's debt ratios. X_{it} contains the set of explanatory variables in the estimation model, α is the constant, β represents the coefficients and e_{it} represent Error term.

The study used pooled regression type of panel data analysis. Therefore the equation for the model will be:

$$WCME = \beta_0 + \beta_1 (PROF) + \beta_2 (LIQ) + \varepsilon \quad \ldots\ldots (2)$$

Where,

WCME = working capital management efficiency

PROF = Profitability

LIQ = Liquidity

ε = stochastic/error term

4.0 Results and Discussion

4.1 Descriptive statistics of the determinants and leverage

The following table below present some of the descriptive statistics of the working capital management efficiency and the explanatory variables of sugar firms in western Kenya from 2006-2011.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
WCME	6	40.09	70.03	52.6667	11.24404
PROF	6	1.03	1.06	1.0450	0.01049
LIQ	6	0.15	0.18	0.1727	0.01178
Valid N (listwise)	6				

Source: Survey data (2013)

A critical examination of descriptive statistics for dependent and independent variables reveals the following observations. The measure of working capital management efficiency reported mean of 52.6667. The minimum and maximum values of the working capital management efficiency were 40.09 and 70.03 respectively and Standard Deviation was 11.24404.

4.2 Correlations results

The results of the Pearson's correlation of the models are shown in table 2 below; it is observed that the correlation between working capital management efficiency positively correlated with Profitability whose degree of association is 0.157. However it is negatively correlated with Liquidity whose degree of association is -0.820. From the above analysis, it can be deduced that the degree of association is weak for Profitability and very strong for Liquidity.

Table 2: Correlations

		WCME	PROF	LIQ
WCME	Pearson Correlation	1	0.157	-0.820(*)
	Sig. (2-tailed)	.	0.766	0.046
	N	6	6	6
PROF	Pearson Correlation	0.157	1	-0.599
	Sig. (2-tailed)	0.766	.	0.209
	N	6	6	6
LIQ	Pearson Correlation	-0.820(*)	-0.599	1
	Sig. (2-tailed)	0.046	0.209	.
	N	6	6	6

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

Source: Survey data (2013)

4.3 Regression Analysis

The results of regression of the model are shown in the following table. R Square value of 0.846, which is in the model, denotes that 84.6 % of observed variability in working capital management efficiency can be explained or predicted by Profitability and Liquidity. Remaining 15.4 % variance in the working capital management efficiency is attributed to other variables. See table 3 below. The F value is 8.240, that is significant at 0.05% (p = 0.000), which suggests that the indicators (independent variable) have significantly explained 84.6 % of the variation in the working capital management efficiency and also indicates the model is a good fit for the data .See table 4 below

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.920(a)	0.846	0.743	5.69647

a) Predictors: (Constant), L, PROF

Table 4: ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	534.793	2	267.396	8.240	0.060(a)
	Residual	97.349	3	32.450		
	Total	632.142	5			

a) Predictors: (Constant), L, PROF

b) Dependent Variable: WCME

Table 5: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	822.979	347.019		2.372	0.098
	PROF	-558.555	303.387	-0.521	-1.841	0.163
	LIQ	-1080.825	270.214	-1.132	-4.000	0.028

a) Dependent Variable: WCME

Source: Survey data (2013)

4.2 Discussion of research findings

This study examined the relationship between working capital management efficiency and profitability and liquidity in the sugar industry.

The first objective of the study was to determine the impact of working capital management efficiency on profitability of sugar industry. The relationship between the working capital management efficiency and profitability is negative and insignificant. This finding accepts the null hypothesis which states that there is no significant impact of working capital management efficiency on profitability of sugar industry. This result is consistent with the correlation analysis. The result confirms earlier work of Vedavinayagam Ganesan (2007).

The second objective the study was to determine the impact of working capital management efficiency on liquidity of the sugar industry. The relationship between the working capital management efficiency and liquidity is negative and significant. This finding rejects the null hypothesis which states that there is no significant impact of working capital management efficiency on liquidity of the sugar industry. This result is consistent with the correlation analysis. The result confirms earlier work of Vedavinayagam Ganesan (2007).

5.1 Conclusions

Analysis of working capital management efficiency was done on Mumias sugar. The analysis was done to find statistical evidence to support or reject the two hypotheses. Result for panel regression indicated that profitability is negative but statistically insignificant. Liquidity is negative and statistically significant. This indicates that there is significant impact of Liquidity on working capital management efficiency. Beta coefficients associated with all the variables are

statistically significant at 5% level. These variables explain around 84.6 % of variation in working capital management efficiency. The remaining variables incorporated in the model explain only 15.4 % of the variation. These facts conclude that Liquidity play a major role in on working capital management efficiency of the sugar- producing firms, while profitability do a dismal role.

REFERENCE.

[1] Chiou, J. R., Cheng, L. and Wu, H.W. (2006). "The determinants of working capital management", *The Journal of American Academy of Business*, Vol. 10, No. 1, pp. 149-155.

[2] Deloof, M. (2003). "Does working capital management affect profitability of Belgian firms?" *Journal of Business Finance and Accounting*, 30(3) & (4), pp. 573-587.

[3] Devore, Jay L. (1995). *Probability and Statistics for Engineering and the Sciences*, 4th Edition, Duxbury Press.

[4] Filbeck, G. and Krueger, T. M. (2005). "An analysis of working capital management results across industries", *American Journal of Business*, Vol. 20, Issue 2, pp. 11-18.

[5] Filbeck, G., Krueger, T. M. and Preece, D. (2007). "CFO Magazine' Working Capital Survey: Do Selected Firms Work for Shareholders?" *Quarterly Journal of Business & Economics*, Vol. 46, No 2, pp. 5-22.

[6] Myers, R. (2007). "Growing problems: The 2007 Working capital survey", CFO Magazine.

[7] Shin, H. H. and Soenen, L. (1998). "Efficiency of working capital management and corporate profitability", *Financial Practice and Education*, Vol. 8, No. 2, pp. 37-45.

[8] Vedavinayagam Ganesan (2007).An analysis of working capital management efficiency in telecommunication equipment industry, **R***ivier academic journal*, Vol.3, No. 2,