

EFFECTS OF INVENTORY CONVERSION PERIOD ON PROFITABILITY OF TEA FACTORIES IN MERU COUNTY, KENYA

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Abstract

This study was undertaken to investigate the effect of inventory conversion period on profitability of tea companies in Meru County. Several literatures relevant to this study were reviewed with a view of isolating research gaps. The study used descriptive research design as this is an effective tool for application of cause- effect statistical methods such as regression analysis. In particular, simple linear regression analysis was used to describe the effect of the inventory conversion period on profitability of tea factories. This regression analysis was based on a five year period between 2009 and 2013. The Census method was used to study the respondents as the population was infinite. The study used questionnaires to collect primary data from the population. These data were analyzed and tested by use of pearson's correlation coefficient and ANOVA to confirm or reject the hypothesis. The research found out that the inventory conversion period statistically negatively affected the profitability.

Keywords: Inventory conversion period, profitability, return on assets, working capital management, liquidity

INTRODUCTION

For a manufacturing firm, inventory which includes raw materials, work in progress and finished goods represents a very significant component of current assets. As such, efficient management of inventory is of great importance to a manufacturing firm. In addition, inventory is working capital component together cash, receivables and account payables. Effective management of each of the components of working capital is crucial as it can increase the value of a firm. Eric Rehn (2012).

Working capital is best defined as the net working capital which is given by the total current assets minus total current liabilities. It represents funds needed by a firm to meet its day to day business operational needs. According to Ani, Wilson, Ifeoma, Ugwunta and Okelue (2013), for a manufacturing firm, investment in working capital accounts for the largest cost of the firm. About 30% to 40% of a manufacturing firm's total investment is in working capital. Therefore, working capital management is of paramount importance to the firm's management. Usually though not always, profit maximizing firms endeavor to strike a balance between current assets and current liabilities. However, there is always a probability of disequilibrium between these two sets of working capital components. When this happens, both the liquidity and profitability may be affected. This is so because when a firm raises profit at the cost of liquidity, it may not be able to settle short term financial obligations as and when they fall due. Similarly, increasing liquidity at the cost of profitability will cause a decline in profitability. This will lower the shareholders value. There must therefore be efficient management of a firm's liquidity-profitability trade –off.

Ebenezer and Asiedu (2011) elucidates that efficient management of working capital which involves planning and controlling of current assets and current liabilities is crucial for manufacturing firms because it directly affects the liquidity and profitability. Both excessive and inadequate levels of working capital are harmful to the firm. While the former lowers the profitability, the later causes shortages and difficulties in conducting the day to day business operations of the firm. This is supported by Hina and Mphil (2014) who found that there is a strong linear relationship between profitability and working capital. The inventory conversion period is one of the metrics of working capital management. This study investigated the effects of inventory conversion period on profitability of the tea factories in Meru County in Kenya.

Research Objective

To determine the effect of inventories conversion period on the profitability of tea factories.

Study Hypothesis

Ho: There is no significant effect of the inventories conversion period on the tea factory's profitability.

Scope of the Study

This study focused only on all the seven tea processing companies located in Meru County. The study was limited to unlisted tea factories. The farming, rental, mining, fishing, insurance and banking were excluded from this research because of their operational differences. The study was based on the companies' financial data for the five years between 2009 and 2013.

REVIEW OF RELATED LITERATURE

The number of days inventory or inventory holding period is the time lag between purchasing materials, manufacturing and selling the finished goods (Hillier, D, Rose, Westerfield, R., Jaffe, J. and Jordan, B., 2010). The inventory holding period is given by raw material conversion period plus work-in-progress conversion period plus finished goods conversion period. Therefore, the inventory conversion period is greatly influenced by the efficiency and effectiveness of the manufacturing process and the selling process. The time taken to produce a given quantity of goods depends on the nature of the product and the type of technology used in the production process. The activity of making a sale depends on the completeness and readiness of the product to satisfy customers' needs and wants. A firm may minimize costs associated with holding large amounts of inventory by adopting efficient stock control systems such as Just-Time System. Reducing inventory to just the optimal level reduces the cost of obsolescence, opportunity cost of excess working capital tied up on excess inventory and stock holding cost. On the other hand, excessive inventory may reduce stock-out cost and lost goodwill of the firm. The number of days inventory or inventory conversion period is calculated by dividing average inventories by the cost of goods sold per day (Huynh, 2011).

Gamze, Ahmet and Emin (2012) conducted a study on the effect of working capital on firm's performance. The study was based on a sample of 75 manufacturing firms listed on Istanbul Stock Exchange Market for the period 2002-2009 with the aim of investigating the relationship between working capital management components and Istanbul firm's performance by using dynamic panel data analysis. The study did not find any relationship between the number of days inventory and the profitability. However in a similar research conducted in Cyprus for the period between 1998 and 2007, the number of days inventory was found to be negatively related to profitability. This is in conformity with the findings obtained by Raheman

and Nasr (2007), Lazaridis and Tryfonidis (2006), Amarjit, Biger and Neill (2010), and Jayarathne (2014).

Makori and Jagongo (2013) obtained conflicting results in a similar research on Kenyan manufacturing and construction firms. They used regression analysis in their investigation of the relationship between working capital and the profitability of manufacturing and construction companies listed on the Nairobi Securities Exchange. By use of a sample of 10 firms, they found a negative relationship between inventory turnover in days and the company's profitability.

In his dissertation, Thuvarakan (2013) concluded that there is no significant relationship between the working capital components including inventory conversion period, receivables period, number of days payables, cash conversion cycle and profitability. In his research on impact of working capital management on profitability of manufacturing firms of United Kingdom, he suggested that the managers should focus on the core business objective to maximize the shareholders wealth by for instance innovating the business processes and the product. These findings were supported by Rehn (2012) who observed that the inventory conversion period does not have significant relationship with the profitability. The reason of these findings could be due to the fact that the researchers had investigated firms from different industries. A further study need to be done on a separate industry to prove or disapprove these findings. Research on this area should be industry specific because there are some industries such as service industries which do not hold inventories.

Raheman and Nasr (2007) investigated the effects of working capital management on profitability of Pakistan firms. The study was based on 94 Pakistan firms listed on Karachi Stock Exchange for a period of six years from 1999-2004. Contrary to Rehn (2012) and Thuvaraka (2013), the study found a significantly negative relationship between the inventory conversion period and the company's profitability. Again these researchers had studied firms in different sectors in the economy. The results of such studies may be compromised by some factors inherent to specific industries which might affect the components of the working capital in unknown ways. For example, it not statistically viable to roll manufacturing firms with banks and insurance companies in to one sample and proceed to treat each member thereof equally. The members differ in terms of stock volume and levels of receivables. In addition, the studies still give conflicting results as regards the relationship between the working capital management and profitability of companies. This study aimed at investigating the effect of the inventory conversion period on profitability of tea factories Meru County in Kenya. Although many studies have been done on the relationship between working capital parameters and profitability, none has been conducted on unlisted tea factories in Kenya by relying on primary data.

Profitability

This is the dependent variable in this research. Profit is not the same thing as profitability. While profit is the excess of revenue over revenue expenditure in a given trading period, say in calendar year, profitability means the measure of the ability of the firm to earn profit (Huynh, 2011). According to Bodie, Kane and Marcus (2004), there are 5 measures of profit the use of which depends on the purpose for which such measure is computed viz. gross profit, operating profit, profit before interest and tax (PBIT), profit before tax (PBT) and profit after tax (PAT).

According to Idiko and Tamas (2009), profitability is expressed as a ratio measuring the rate of some profit which is benchmarked against some base measurement or variable of reference such as total assets, equity, non-financial assets, gross profit, investment, net capital employed and other appropriate variables. Therefore Profitability is given as (profit/Base measurement) 100%. This research used profitability as the dependent variable. Contrary to other researchers such as Huynh (2011), Filipa and Garcia (2011), Melita and Elfani (2010), and many others, profitability was measured as (PBIT/TOTAL ASSETS)100%.Huynh (2011), used operating profit as the numerator in calculation of return on non-financial assets. Senthilman (2011) used gross operating profit margin to measure profitability. Other researchers such as Huynh (2010), Biger et al (2010) and Lazaridis (2006) used gross profit as numerator in calculation of return on assets thus failing to deduct operating expenses from gross profit. The researcher decided to use net profit or PBIT because the main purpose is to measure the effect of WCM on the company's profitability but not operating profit only.

It is clear from the above paragraphs that the researchers have greatly disagreed on the direction of the relation between inventory conversion period and the profitability. They have found conflicting results in the study of the effects of inventory conversion period on company's profitability. In addition, there is ambiguity as regards the proxies of the working capital variables which act as the independent variables. Further, although many researchers have used return on assets (ROA) as the proxy for the dependent variable, they have disagreed on how to measure it and is therefore necessary for the researcher to extend these studies by use of appropriate and single measure of working capital management to investigate the effects of inventory conversion period on the profitability of tea factories.

RESEARCH METHODOLOGY

Research design

This study is ex- post facto in nature since it sought to investigate the effects of the independent variable on the dependent variable after occurrence. The study used descriptive research design and applied quantitative analysis to describe the effects of inventory conversion period

on the profitability. This research design was chosen because according to Huynh (2011), the design is applied in studies containing large amount of qualitative and quantitative data. In addition, the descriptive design is an effective tool for application of cause-effect statistical methods such as regression and correlation analysis. According to Thuvarakan (2012), the use of descriptive analysis helps the researcher avoid the difficulties of getting clear understanding about the data collected and it's pattern over the years. To effectively apply the descriptive analysis, the SPSS software was used to analyze the data for the variables.

Empirical model

Simple linear regression model was used to study the effects of the independent variable on the dependent variable by computing the coefficients of linear function. The following is the formula for the simple linear regression model.

$$Y = \alpha + \beta x + e$$

Where: Y= dependent variable

α = the Y intercept

β = slope coefficient for independent variable x

e= error term

Hence, the model for the research is as follows

$$ROA = \alpha + \beta (\text{ICP}) + e$$

Where:

ICP= inventory conversion period

ROA= return on assets

e= error term

Simple linear regression was used because it is a good tool for describing the relationship between the dependent and independent variable. Further, the relationship between inventory conversion period and profitability could be reasonably assumed to be linear. The method was also used by other researchers including Nasr and Raheman (2007), Mogaka and Jagongo (2013), Hina, Mba and Mphil (2014) and Jayarathne (2014).

Target population

The study targeted the accountants, store keepers, and credit officers of the seven incorporated tea factories in Meru County. This sector was selected because it has been largely ignored by researchers in spite of its enormous contribution to Kenyan economy as a top foreign currency earner. The County has seven tea factories and since this is a small number, the researcher conducted a census.

Table 1: Target population

Category	Population
Factory accountants	7
Credit officers	7
Store keepers	7
Total	21

Data Collection Instrument

The study relied on primary data collected from the entire population. The data needed was quantitative in nature. A questionnaire was used to collect primary data. These questionnaires required data inform of ranges or scale for example the range between minimum and maximum profit in a given year. These questionnaires carried both closed and open ended questions. The questionnaire was administered by the researcher personally.

Pilot testing

Prior to administering the questionnaire to collect the data from the field, the researcher conducted a pilot study in Gatundu North, a Sub County in Kiambu County which is outside the targeted population to test the validity of the instruments. This was necessary in order to verify whether the questionnaire was clear to the respondent, establish whether the questionnaire effectively addressed the data needed for this study, assess and identify any problems the respondents may encounter in completing the questionnaire that may not have been foreseen when constructing the questionnaire.

Reliability

According to Mugenda (2003), a reliability coefficient of 0.8 or more indicates high reliability of the data. The researcher applied the internal consistency method to gauge the reliability in data. According to this approach, scores obtained from different items in the questionnaire were correlated and then Cronbach's Coefficient Alpha was calculated to determine correlation between items by use of the formula given as $\text{Alpha} = \frac{N}{1+r(N-1)}$, where r is the mean inter-item correlation and N is the number of items in the scale. This technique, which required application of the Kuder-Richardson (K- R) 20 formula produced a reliability coefficient of 0.807 which indicates that the items in the questionnaire were highly correlated. This implies that there is a high degree of consistency between the items.

Validity

Validity is the extent to which results obtained from the analysis of the data accurately represent the phenomenon under investigation (Mugenda M 2003). To achieve content-validity of data, the researcher included all the company officials in the finance department who included the factory accountants, store keepers and the credit managers. This ensured that the whole domain of relevant content was specified on the onset of the study to ensure comprehensive data collection process. In addition, all the information necessary in computation of all the independent and dependent variables were included. The questionnaires were also evaluated for content validity by a professional before administration.

Data Analysis Procedures

Once the questionnaires were collected, they were scrutinized to ensure they were duly completed and were consistent and there after they were numbered. A check to ensure that all questions were answered according to the instructions was also conducted. This was intended to reduce errors and enhance the data validity. The quantitative data was then analyzed by tallying responses of closed ended questions. The data was then coded and entered into the computer for analysis by use of SPSS. The data was presented in form of tables and figures. The study used simple linear regression model to analyze the data. The standard normal distribution test at 5% level of significance was conducted on the random variable of the regression equation to test the hypothesis that it did not affect the company's profitability.

RESULTS AND DISCUSSION

Descriptive Statistics

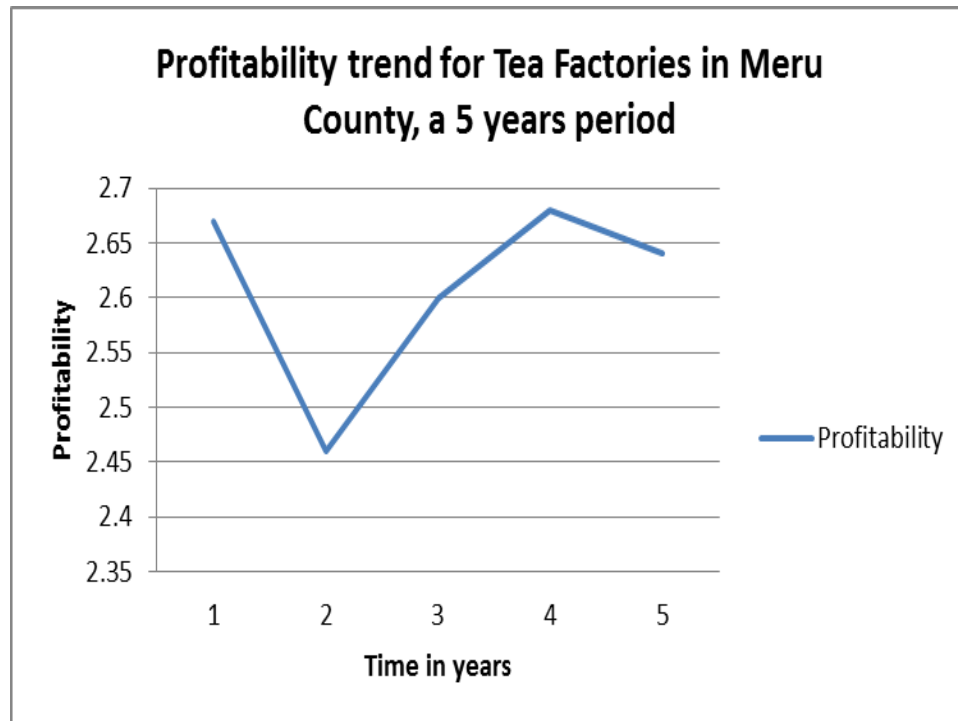
Table 2 below shows the results of descriptive statistics performed on the two variables used in this study. The five-year average of the tea factories' profitability in Meru County is 2.6093% with a standard deviation of 0.09. The small standard deviation implies that the annual profitability of tea factories in Meru is consistently almost the same. This is therefore an indication that whatever variables that control this outcome variable have been maintained in a non-diversely varying record.

Table 2: Descriptive Statistics

	N	Min	Max	Mean	SD
Profitability	5	2.46	2.68	2.6093	.08890
Inventory conversion period	5	27	32	30.00	1.871

Trend analysis performed on the data collected in this study (Figure 1) indicate that Profitability of tea factories in Meru County has gradually increased with time for the last five years of the period under consideration characterized by an initial drop in the first year from 2.67 to 2.26.

Figure 1: Profitability Trends



Despite the short periods taken by the variables under investigation, this study established that tea factories in Meru have very low profitability. The poor profitability trend could be associated with some other management malpractices other than those under consideration in this study.

Effects of Inventories Conversion Period on the Profitability of Tea Factories

Inventory conversion period or cycle is the amount of time in days that a producing company requires to purchase raw materials, manufacture them and sell the finished goods (Hillier et al, 2010). This period is thought to have an effect on the company's profitability and hence the reason for this analysis.

Results (Table3) of this study reveal a strong simple correlation between the inventories conversion period and the profitability of the tea factories in Meru County. In table 4, the Pearson correlation coefficient ($r = -0.932$) presents an inverse linear relationship between the two variables under consideration. Therefore, a tea factory in Meru County is bound to make little profits if it takes a lot of time to produce finished goods from raw materials and sell them.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	-.932(a)	.869	.825	.03722

a. Predictors: (Constant), Inventory conversion period

Analysis also indicates that we can explain 86.9% of the factory's profit behavior using information provided by inventory conversion period (Table 3). The effect of the inventory conversion period on tea factory profitability is statistically significant ($P = 0.021 < 0.05$) at 5% level of significance (Table 4). The hypothesis that there is no significant effect of the inventory conversion period on profitability is rejected.

Table 4: Analysis of Variance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.027	1	.027	19.822	.021(a)
	Residual	.004	3	.001		
	Total	.031	4			

a. Predictors: (Constant), Inventory conversion period

b. Dependent Variable: Profitability

Based on the coefficients of the linear regression function (Table 5), the model;

$$Y = \alpha + \beta x$$

Where: Y= dependent variable (Factory's profitability)

α = the Y intercept (Constant)

β = slope coefficient for independent variable x (inventory conversion period)

The regression function hence becomes;

$$Y = 1.281 - 0.044(\text{inventory conversion period})$$

The coefficient of the independent variable ($B = 0.044$) is statistically significant. Similarly, the constant also significantly contributes to the observed values of profitability of the tea processing factories in Meru County. There is therefore significant negative correlation between inventory conversion period and the profitability. This is supported by other researchers including Armarjit et al (2010), Jayarathne (2014), Lazaridis et al (2006) Neil (2010) and

Raheman (2007). The finding however contradicted those found by Emin et al (2012) and Thuvarakan (2013) who found no correlation between these two variables.

Table 5: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.281	.299		4.285	.023
	Inventory conversion period	-.044	.010	.932	4.452	.021

a. Dependent Variable: Profitability

CONCLUSION

The main objective of this study was to find out whether the inventory conversion period affects the profitability of tea factories in Meru County. It was found out that inventory conversion period had negative correlation with the profitability.

On the basis of the finding of this research, inventory conversion period has a statistically negative significant effect on a tea factory's profitability trend in Meru County. Therefore, the amount of time in days that a tea factory takes to purchase raw materials, manufacture them and sell the finished goods, is a significant determinant of the company's profitability. This implies that the shorter the inventory conversion period, the higher the profitability and the reverse is true.

RECOMMENDATIONS

Policy recommendations

The factories management should maintain low inventory conversion periods in order to improve their profitability. They should also look for other ways of improving profitability as it was found to be low.

Recommendation for further research

A further study should be conducted to identify other factors that play major roles in shaping the tea factories' profitability trends. In addition, there is need to carry out an investigation to find out the causes of low profitability of tea factories in Meru county. Further, there is need to investigate the effects of other working capital metrics such as days accounts payable, days accounts receivable and cash conversion cycle on profitability of tea factories in Meru County, Kenya.

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