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Working Capital Management and Financial Performance of Manufacturing firms Listed at the Nairobi Securities Exchange

By: Argan Wekesa[1] & Penina Nyawira Njeru[2]

Abstract

The main objective of the study was to determine the influence of working capital management on financial performance of manufacturing firms listed in the Nairobi Securities Exchange (NSE). Specifically, the study sought to establish the influence of cash management, receivables management, inventory management and accounts payables management on financial performance of manufacturing firms listed in the NSE. The study was anchored on the operating cycle theory, cash conversion theory, value chain theory and transaction costs theory. The study adopted the causal research design and the population was nine manufacturing companies listed in the NSE. The study used secondary panel data for five years (2010 – 2019) to depict the most current business cycles. Data collected was analysed through panel data regression and presented in figures and tables. The results determined that cash conversion cycle did not have a significant influence on financial performance of manufacturing firms listed in the NSE. Further, receivables management, inventory management and payables management had a significant positive effect on financial performance of manufacturing firms listed in the NSE. Based on the findings, the study makes the following recommendation. Regarding cash management, the study recommends to the management of manufacturing firms to focus more on other aspects of cash management apart from cash collection cycle. On receivables management, the study recommends to management to institute effective credit management practices to increase their receivables turnover ratio to the maximum practicable so as to optimize their relationships with their debtors. Regarding inventory management, the study recommends that management should implement modern and automated inventory management practices aimed at improving the inventory turnover. The study also recommends that manufacturing firms should optimize their payables management.

Keywords: *Cash, Receivables, Inventory management, Accounts payable, financial performance, manufacturing companies.*

Background of the Study

Working capital management is the practice of planning for the acquisition and application of short-term liabilities and assets. It depicts the movement of readily accessible resources that are vital for the continuous operations of the business (Akomeah, 2019). Working capital is the excess of the organization's entire investment in current assets over its current liabilities, the current assets are the resources that a firm expects to convert into cash within one year (Evci & Şak, 2018). Since investment in working capital entails shortage and holding costs, the business must therefore find an optimum trade-off between those two costs (John, 2017). Working capital management encompasses handling the short-term claims and assets of the business. According to Baños-Caballero, García-Teruel and Martínez-Solano (2014), working capital

[1] *Senior Lecturer at the Co-operative University of Kenya*
[2] *Graduate Student at KCA University*

management ensures that a firm has adequate cash flow in order to meet its operating expenses and short-term debt responsibilities. Effective working capital management hence enables the firm to meet its liquidity and profitability objectives.

The importance of working capital management is demonstrated by numerous arguments. First, over half of the total assets of a typical business are the current assets. Holding unnecessary levels of current assets can result to the firm not attaining its expected return on investment (Ding et al., 2013). However, holding very little current assets may make it difficult for the firm to maintain its operations or incur shortages (Baños-Caballero et al., 2012). Therefore, while conducting their daily operations, firms are required to maintain a balance between profitability and liquidity regarding management of working capital. Working capital management is critical for manufacturing firms (John, 2017). This is because a rapid change in economic and financial conditions affects the working capital of manufacturing firms which has very high investments in working capital for their operations.

Working capital management remains one of the most critical financial management aspects of a firm. In Turkey, Öztürk and Vergili (2018) note that managing working capital components in emerging markets is critical due to the lack of depth of financial markets and low diversity in financial products. This makes these markets to have insufficient capital accumulation and saving volume. Firms that have effective working capital management practices in emerging markets are able to achieve their growth, performance and sustainability objectives better than their counterparts with less effective working capital management.

Research Problem

Today's business environment requires organizations to do more with less resources. This indicates that businesses must not squander opportunities to free up their working capital to achieve more. The struggling manufacturing sector companies could adopt efficient working capital management to free up cash trapped in working capital to streamline processes, enhance service levels, seize new investment opportunities, fund growth and enhance their financial performance. Various studies have linked working capital management to financial performance. Nyangweso and Wepukhulu (2019) established that receivables collection period and inventory conversion period had a negative influence on financial performance of commercial and services firms listed in the NSE. The study however found that cash conversion cycle had a positive effect

while account payables period had an insignificant effect. This study was however, conducted on commercial and services firms, not on manufacturing firms which the focus of the current study are.

In India, Pinku and Mitra (2018) established that current ratio, quick ratio and finished goods turnover had significant influence on financial performance of the steel industry while debtors' turnover did not have any effect. This study did not consider operating cashflows turnover and payables turnover. Kombo and Wekesa (2017) found that account receivables management had a significant relationship with financial performance while cash conversion cycle and accounts payables management had a negative relationship with financial performance of private medical facilities in Mombasa County, Kenya. This study was on medical facilities whose findings could not be generalizable to manufacturing companies. Besides, Rakočević, Latinović and Milosavljević (2014) established that inventory management and receivables management were significant predictors of financial performance of Serbian manufacturing companies. This study however, did not include cashflow management and payables management which are critical working capital components. The reviewed studies hence had conceptual and contextual gaps which the current study sought to fill by determining the influence of working capital management on financial performance of manufacturing firms listed in the NSE.

Research Objectives

General objective

The main objective of the study is to determine the influence of working capital management on financial performance of manufacturing firms listed in the Nairobi securities exchange.

Specific objectives

i) To establish the influence of cash management on financial performance of manufacturing firms listed in the Nairobi securities exchange
ii) To examine the influence of receivables management on financial performance of manufacturing firms listed in the Nairobi securities exchange
iii) To determine the influence of inventory management on financial performance of manufacturing firms listed in the Nairobi securities exchange
iv) To assess the influence of accounts payables management on financial performance of manufacturing firms listed in the Nairobi securities exchange

Research Questions

i) What is the influence of cash management on financial performance of manufacturing firms listed in the Nairobi securities exchange?
ii) How does receivables management influence financial performance of manufacturing firms list in the Nairobi securities exchange?
iii) What is the influence of inventory management on financial performance of manufacturing firms listed in the Nairobi securities exchange?
iv) How does accounts payables management influence financial performance of manufacturing firms listed in the Nairobi securities exchange?

Justification of the Study

The manufacturing sector in Kenya faces key challenges including low contribution to the GDP, low share of the regional export market and high mortality of small companies and financial distress and poor financial performance of large and medium manufacturers (Cytonn, 2019). The financial performance challenges by these manufacturing companies could be addressed by adopting efficient working capital management practices. This study hence will provide evidence which these manufacturing companies can use to devise effective working capital management practices. The findings will also be valuable to policy makers, manufacturing companies, financial management professionals, scholars and researchers.

Scope of the Study

This study focused on manufacturing companies that were listed in the NSE. Though there are various working capital management aspects, the study focused on cash management, receivables management, inventory management and accounts payables management. The study collected panel data from 9 manufacturing companies for 10 years (2010 – 2019).

Literature Review

Introduction

The literature review related to the study is presented in this chapter. This literature appertains to the influence of working capital management on a firm's financial performance. The chapter includes theoretical review which provides the three theories that were applied in the study. Moreover, the chapter presents empirical review consisting of studies on influence of cash management, receivables management,

inventory management and accounts payables management on financial performance. Besides, the knowledge gaps, conceptual framework and operationalization of variables are presented in this chapter.

Empirical Review

The empirical review on the influence of working capital management and financial performance is provided in this section. The section is divided into four sub-sections as per the research objectives. These include sections on influence of cash management, receivables management, inventory management and accounts payables management on financial performance.

Effects of Cash Management on Financial Performance

For a business to be profitable and sustainable, proper cash flow management is necessary. In a research carried out by Bari, Muturi, Mohamed and Samantar (2019), the above hypothesis was put to test. The research conducted in Somalia using a sample size of 39 food and beverage retailers in a Somali state revealed that cash conversion in managing cash has a positive significant relationship to business performance. Therefore, any act to enhance financial performance should involve proper cash management. They concluded that improving cash flow management especially by retailers, will automatically yield to excellent financial performance of most businesses.

Some studies suggest that cash management is not important when making financial performance decisions, as liquidity management is not vital to good financial performance. A study was conducted and the aforementioned findings were recorded by Muraya (2018) on firms listed in the Nairobi securities Exchange between 2012 and 2016. The study took into consideration the investing activities, operating activities and financing activities of firms under investigation. The Return on equity (ROE) and Net Operating Income (NOI) were used as profitability measurement proxies. It was established that operating cash flows had a statistical insignificance on profit after tax.

Cash flow management and net working capital affects financial performance. Afrifa (2016) conducted an investigation on the topic on Small and Medium Enterprises (SMEs) in the UK. In a regression analysis form of study, a sample size of 6,926 non-financial SMEs between 2004 - 2013 were taken into consideration. A significant concave correlation between working capital and financial performance was recorded without taking cash flows into consideration. When cash flows were included. The relationship

shifted to a convex one. It was recommended that executives should take into considerations their present cash flow status before making any investment decision for financial performance to be enhanced.

Effects of Receivables Management on Financial Performance

In a research conducted by Bari, Muturi, Mohammed and Samantar (2019), the hypothesis was put to test. The study found that debtor retailers must put in place policies and strategies guiding accounts receivables and that they should be implemented and followed strictly.

Another study by Agnes and Mutiso (2019) carried out a study on manufacturing companies in Kiambu County to determine the effect of receivables management on the performance of SMEs in the county. The findings showed that there existed a positive significant relationship between profitability, and collection efforts, and receivables management. Mbula, Memba and Njeru (2016) studied the effect of receivables management on the financial performance of government venture capital funded firms in Kenya. It was established that a positive correlation between receivables and financial performance existed.

Proper receivable management can help remedy financial performance issues during a financial crisis. Denčić-Mihajlov (2017) conducted a research to investigate on the matter during a financial crisis in Serbia. The study results established that there was a positive but insignificant relationship between accounts receivables and other independent variables such as operating profit margin and Return on Total assets (ROA). The researcher opined that crisis might lead to a change on the effect of receivables on the financial performance on firms.

Munene and Tibbs (2018) did a research on Embu water and Sanitation Company Limited in Kenya to establish the impact of receivable management on financial performance. It was established that current ratio and collective period had a significant positive relationship with ROE hence, financial performance can be improved by reducing debt payment period. It was recommended that the company obtain a proper receivable system for optimum financial performance. Odondi, Nteere, and Njeru (2015) carried out a research on Deloitte East Africa to find out the impact of receivable management on financial performance. The study established that management of receivables are significantly related to financial performance of a company.

Effects of Inventory Management on Financial Performance

In a study by Bari et al. (2019), the focus was to study the effects of inventory management on financial performance. In the study the research was conducted in Somalia using a sample size of 39 food and beverages retailers. It was concluded that inventory management was an important factor in food and beverage businesses. Hence, for financial performance to improve, retailers must have good inventory management policies and procedures. The study also established that there is a critical need to establish an inventory system that closely scrutinizes the stock for the retailers. A monthly stock take was proposed as the ideal inventory system.

Kipkirui (2018) carried out an investigation on Kenyan manufacturing firms to find out the impact of optimal inventory orders on firms' performance. All manufacturing firms listed under NSE from 2012 to 2016 were analyzed. From the correlation coefficient, the R-value was 0.881, indicating that a strong link existed between inventory holding costs, inventory conversion period, actual inventory per year and optimal inventory orders and financial performance. Mwangi (2015) did a research on Crown Food Limited in Kenya to establish the impact of inventory management on food processing companies. In a descriptive research, 110 respondents were considered for the research. The study showed that a small increase in finished goods production is likely to influence profitability in food processing companies.

Effects of Accounts Payables Management on Financial Performance

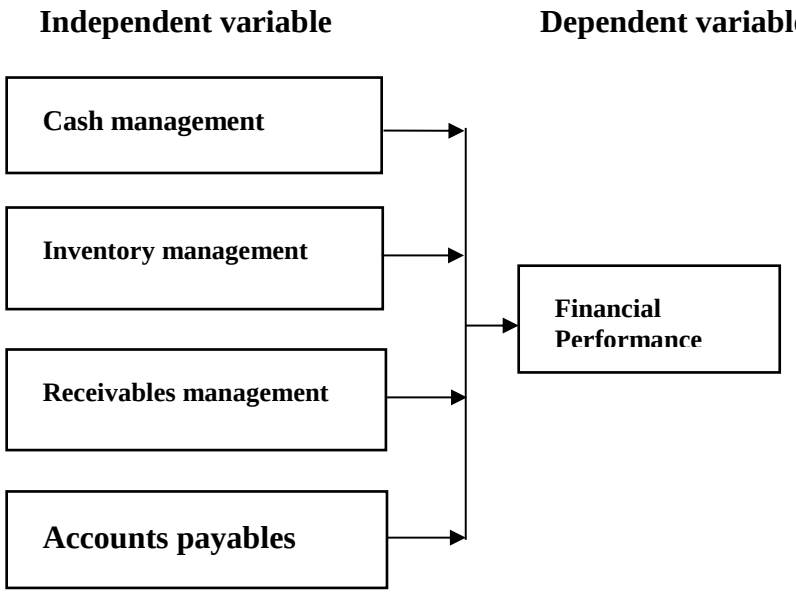
Nwakaego and Ikechukwu (2019) performed a research to determine how financial performance is affected by control of accounts payable in domestic manufacturing organizations in Nigeria. It was established that accounts payables days positively and significantly affect the profitability ratio at a significance level of 1%. Therefore, it is clear that a unit increase in account payable days of a chemical or building company will lead to a significant increase in financial performance.

Judith and Muturi (2018) carried out a research to determine the impact of working capital management on financial performance of Kisii County hospitals. It was established that proper control of paying period of accounts would lead to profitability in hospitals. Bari, Muturi, Mohamed and Samantar (2019) in their research studied the effects of payables management on financial performance. In an interview conducted with 39 retailers of food and beverages companies, they found an insignificant relationship between payables management and financial performance.

Kimutai and Muigai (2018) also carried out a research to establish the effect of working capital management on financial performance of SMEs in Nairobi County. Among the components of working capital management, accounts payable management was one of the variables under investigation. It was noted that account payable management and other working capital management components significantly affected profitability of SMEs in Nairobi County. Accounts payable was the most significant component of working capital management.

Conceptual Framework

The conceptual framework that guided the study is provided in Figure 1. The predictor variables in the study are working capital management components (inventory management, payables management, cash management and receivables management). Financial performance (measured using ROA) is the dependent variable in the study. The study applied firm size as a control variable. This was measured using book value of assets.



Research Methodology

Introduction

The methodology that was adopted in this study is presented in this chapter. This encompasses a description and justification of the research design adopted, the sample size and technique applied in sampling. Besides, the chapter provides the process of data collection, the techniques applied in data analysis and how the results were presented. Further, the chapter provides a description of the pre and posttest diagnostics that were conducted.

Research design

The causal research design was applied in this study. The study used secondary data which was applied to determine the hypothesized influence.

Target Population

The study population was nine (9) manufacturing firms listed in the NSE. This sector was selected for the study due to its importance in attaining the Kenya industrialization vision through Vision 2030 and the Big 4 Agenda.

Sample Size and Sampling Technique

The study conducted purposive sampling to select six manufacturing firms. Three manufacturing firms (Mumias, Eveready, and Unga Ltd) were excluded in the study as they were undergoing financial distress at the time of study and hence, they could be compelled by regulators to adopt working capital management practices aimed purely at survival. Purposive sampling was adopted in the study to focus on six (6) manufacturing firms that were expected to provide reliable and accurate information on working capital management and exclude those firms whose working capital management might be influenced by regulators.

Research Instrument

Secondary balanced panel data that was used in this study was collected using a secondary data collection sheet. This is a matrix (Appendix I) which certifies that all the data from the nine manufacturing firms for the five years and for all the variables are well captured.

Data Collection Procedure

The panel data required for the study was collected from the audited financial statements of the manufacturing firms listed in the NSE. The financial statements were accessed from the companies' website. The study used NSE and Capital Markets Authority (CMA) databases to access the secondary data required. The study then transferred the data into excel sheet, and edited it to ensure that there was no missing data. This was then transferred to a software that aided in analysis.

Data Processing and Analysis

The study applied descriptive, exploratory and balanced panel data analysis techniques. First, the study used exploratory analysis techniques where trends and overlain plots were developed for all the variables (financial performance, cash management, receivables management, payables management, and inventory management) for all the manufacturing companies listed in the NSE. The study also applied descriptive analysis where standard deviation, means, maxima and minima of the variables were determined.

The study questions were answered by subjecting the collected data to panel data analysis methods. The study would either apply the pooled ordinary least squares (POLS) or panel regression analysis model (random effects or fixed effects). These models would enable the study to determine the influence of working capital management on financial performance of manufacturing firms listed in the NSE. The process of analysis of the data using the panel data models entailed three steps. In the first step, the study conducted a Hausman test that was used to determine the most appropriate model to apply between the random effects and fixed effects. In the second step, the study would conduct a Breusch-Pagan Lagrange multiplier (BPLM) test which would assess the most appropriate model between POLS and random effects model. This would only be conducted if the random effects model would be selected by the Hausmann test. The resulting empirical model was of the form;

$$Y_{it} = \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \varepsilon_{it} \quad \text{..... (i)}$$

Where,

Y = Financial performance

X_1 = Cash management

X_2 = Inventory management

X_3 = Receivables management

X_3 = Accounts payables management

t = time period (2015 - 2019)

i = Manufacturing company (1 - 9)

ε = error term

Panel data diagnostics (test for multicollinearity, test of heteroscedasticity, test of serial correlation and test of normality of residuals) were conducted. The first test conducted before model fitting was the multicollinearity test. This assesses whether there are any two independent variables that are highly related. This test was conducted using the variance inflation factors (VIF). The critical value for the VIF is 5. When an independent variable's VIF is below 5, this shows no signs of multicollinearity. However, when the value is above 5, this indicates presence of multicollinearity.

After this test, the model was fitted. After model fitting, test for heteroscedasticity was conducted. The study utilized the Breusch-Pagan Cook Weisberg Test for heteroskedasticity (Colomb et al., 2016). The null hypothesis of the test is that there is homoscedasticity, while the alternate hypothesis is heteroscedasticity. The null hypothesis was tested at p value of 0.05 and would be accepted when p value is above 0.05. Robust errors would be used if heteroscedasticity was present.

Further, serial correlation test was conducted. This is mostly relevant to macro panels with long time series of over 20 years. Autocorrelation or serial correlation inflates the r squared of the model and deflates the standard errors of the coefficients. In this study, Wooldridge test was used to assess serial correlation (Chandra & Sharma, 2013). The null hypothesis in this test is that there is no serial correlation, while the alternate is that there is serial correlation. The hypothesis is tested at 5% level of significance. Therefore, the null hypothesis is accepted when the p value is above 0.05.

Lastly, the study tested for normality of the regression residuals. This was conducted using the Shapiro Wilk test. After the model was fitted, residuals were generated and saved. Then Shapiro Wilk test was used to assess whether the residuals were normally distributed. The null hypothesis in the test is that the residuals are normally distributed. The hypothesis is tested at 5% level of significance and is accepted if the p value is above 0.05.

Operationalization of Variables

This section provides the operationalization of variables which entails firmly definition of into measurable indicators and aspects. The process comprises of defining the fuzzy variables into their quantitative, empirical and measurable aspects. The operationalization framework is provided in Table 1 and provides the variables, their measures, the measurement scale and how they are computed.

Table 1: Measurement of Variables

Variable	measure	Variable	Measurement	Measurement or computation
Cash management	CCC	Independent	Ratio	Days of Inventory Outstanding + Days of Sales Outstanding - Days of Payables Outstanding.
Inventory management	Inventory turnover rate (ITR)	Independent	Ratio	Cost of goods sold/average inventory
Receivables management	Account receivable turnover (ART)	Independent	Ratio	Credit sales /average accounts receivable
Accounts payable management	Accounts payable turnover (APT)	Independent	Ratio	Credit purchases / average payables
Financial performance	FP	Dependent	Ratio	ROA

Findings and Discussions

Introduction

This chapter presents data analysis and the ensuing study results and findings. This appertains to the data collected from six manufacturing companies for a period of 10 years (2010 – 2019). The analysis was aimed at attaining the research objectives that sought to establish the influence of cash management, receivables management, inventory management and accounts payables management on financial performance of manufacturing firms listed in the NSE. The results presented in this chapter entails the results from the descriptive analysis, exploratory analysis, model specification tests and the fitted model.

Descriptive Statistics

The study conducted descriptive analysis of the collected panel data. This was conducted to provide a synopsis of the general distribution of the data regarding central tendency, dispersion and the range. The findings are presented in Table 2. The results indicate that the mean for cash conversion cycle (CCC) for the manufacturing firms listed in the NSE was 68.58 days with a standard deviation of 27.95. This indicates that the manufacturing firms generally spent 68 days to turn their inventory to cash. Moreover, the findings indicate that the average inventory turnover ratio (ITR) was 5.14 with a standard deviation of 2.76. These results indicated that on average, the manufacturing companies sold and replaced their inventories 5.14 times. Further, the accounts receivables turnover ratio (ATR) was 4.96 with a standard deviation of 2.41. This indicates that on average, the manufacturing firms collect around 4.96 times of their receivables from their credit sales.

Table 2: Descriptive Statistics

Variable		Mean	Std. Dev.	Min	Max	Observations	
CCC	overall	68.57833	27.95425	25.51	129.39	N =	60
	between		25.58601	33.485	98.431	n =	6
	within		15.05515	27.44433	99.53733	T =	10
ITR	overall	5.137333	2.759898	1.64	13.45	N =	60
	between		2.737852	2.081	9.321	n =	6
	within		1.12456	2.860333	9.266333	T =	10
ART	overall	4.961833	2.414898	2.41	12.21	N =	60
	between		2.413338	2.802	8.68	n =	6
	within		.9465564	1.931833	8.491833	T =	10
APT	overall	2.64	1.296936	.98	5.49	N =	60
	between		.9635443	1.2	3.733	n =	6
	within		.9461762	.895	5.58	T =	10
L_assets	overall	6.477049	.8942804	4.800662	7.835656	N =	60
	between		.9620908	4.957715	7.727345	n =	6
	within		.1237528	6.242044	6.740337	T =	10
FP	overall	6.966	3.636198	.35	14.52	N =	60
	between		2.72911	4.692	11.925	n =	6
	within		2.628694	2.087	13.078	T =	10

The study results presented in Table 2 also indicated that the mean of the accounts payable turnover ratio (APT) was 2.64 with a standard deviation of 1.30. This implies that the manufacturing companies listed in the NSE pay on average 2.64 times of its accounts payables in a year. Besides, the study results presented in Table 2 also indicate that the financial performance, measured through return on assets (ROA), averaged

6.97 for the manufacturing firms with a standard deviation of 3.64. These results indicate that the 6 manufacturing firms included in the study had robust financial performance though the disparity amongst the firms was huge.

Study Variables

This section provides the exploratory analysis (panel data line plots and overlain plots) for the study variables for the six manufacturing companies included in the study. This indicates the trends for the 10 years for the firms which is essential for comparability.

Cash Management

Cash management was measured using cash conversion cycle in this study. This indicates the number of days that a firm takes to generate cash from its inventory. The trends of cash conversion cycle for the six manufacturing firms for the 10-year period are provided in Figure 2.

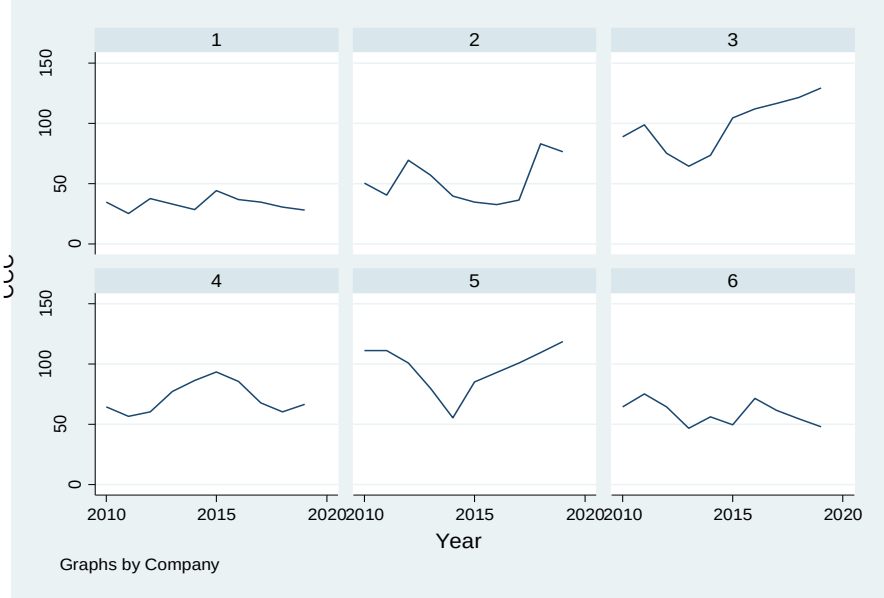


Figure 1: Panel Data Line Plots for Cash Conversion Cycle

The results provided in Figure 2 indicate that all the firms experienced significant changes in their cash collection cycles in the 10-year period. Company 1 was the one that experienced the smallest shocks while company 2, 3 and 5 experienced significantly bigger shocks.

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Inventory Management

The panel data line plots for inventory management were developed and they are provided in Figure 3. These trends compare the inventory management practices (measured using inventory turnover ratio) for the six manufacturing companies for the ten year period.

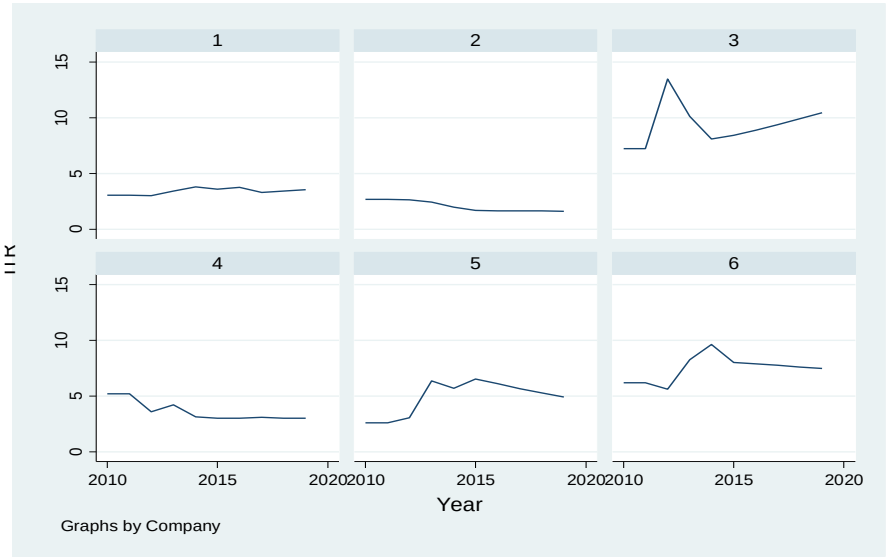

Figure 2: Panel Data Line Plots for Inventory Turnover Ratio

The study results presented in Figure 3 indicate that inventory turnover ratio remained significantly unchanged for Company 1, 2 and 4. However, Companies 3, 5 and 6 changed their inventory management practices significantly over the study period.

Accounts Receivables Management

The panel data line plots for accounts receivables management were developed and presented in Figure 4. Accounts receivables management was measured using receivables turnover ratio.

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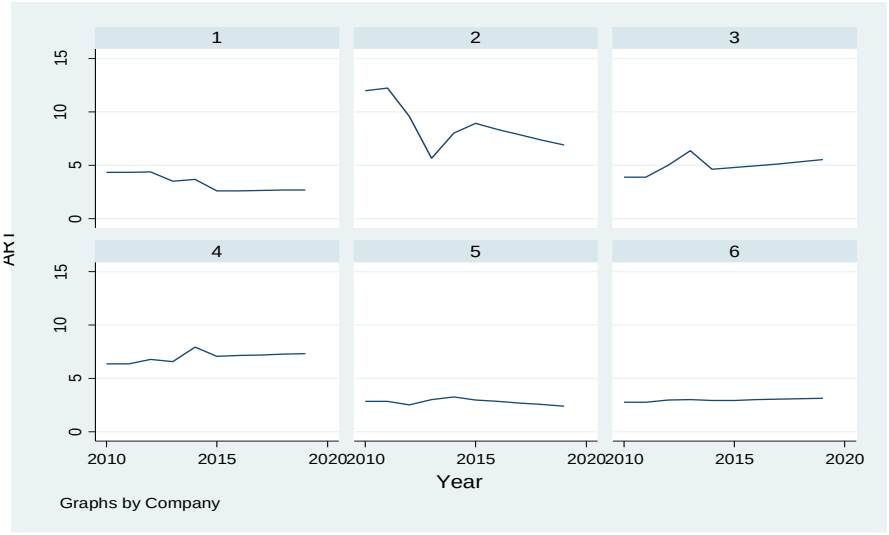

Figure 3: Panel Data Line Plots for Accounts Receivables Turnover Ratio

The study results provided in Figure 4 show that Companies 1, 4, 5 and 6 had minimal changes to their practices on accounts receivables management as indicated by the accounts receivables turnover ratio. However, Companies 2 and 3 had some significant changes to how they management their accounts receivables in the study period.

Accounts Payables Management

Study results on accounts payables management as indicated by the payables turnover ratio are provided in Figure 5. These results indicate trend of accounts payable management for the six manufacturing companies included in the study.

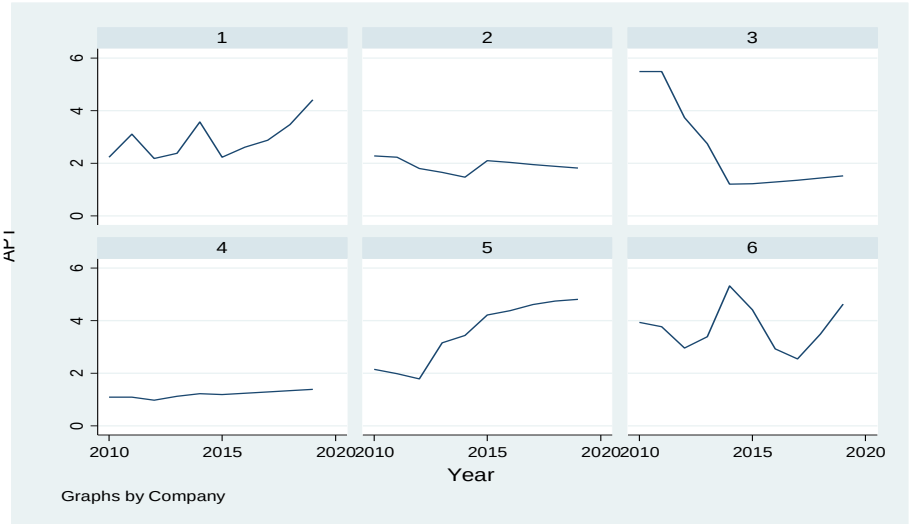

Figure 4: Panel Data Line Plots for Payables Turnover Ratio

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The study results provided in Figure 5 established that Companies 2 and 4 experienced insignificant changes on their accounts payables management over the 10 year period. However, Companies 1, 3, 5 and 6 had significant changes to their payables management over the ten year study period. Specifically, Company 3 had a high decrease to its payables turnover ratio while Company 5 had an improvement to its payable turnover ratio.

Financial Performance

The study's dependent variable was financial performance. this was measured using return on assets (ROA) for all the manufacturing firms included in the study. The overlain plots for the ROA of the firms are provided in Figure 6. These trends enable comparison of the changes in ROA for the firms for the study period.

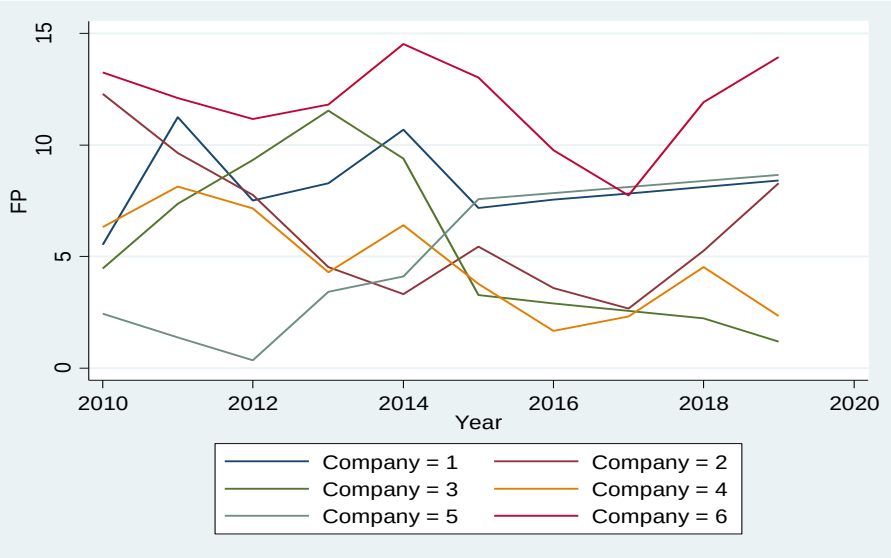

Figure 5: Overlain Plots for Financial Performance

The results as provided in Figure 6 determined that all the firms experienced shocks to their financial performance in the ten pear study period. Firm that experienced improvement in their financial performance was only firms 5. The others firms experienced no significant changes in the financial performance trends. However, Company 4 experienced reduction its financial performance as indicated by the trend.

Diagnostic Tests

Panel data diagnostics (test for multicollinearity, test of heteroscedasticity, test of serial correlation and test of normality of residuals) were conducted. According to Gujarati (2011), before fitting data into a linear

regression model, regression diagnostics should be conducted to assess the regression model assumptions and examine whether the model has issues that would affect the efficiency, accuracy and biasness of the model. Some of the tests are conducted before the model is fitted while others are conducted on the residuals after fitting of the model.

Test of Multicollinearity

The first test conducted before model fitting was the multicollinearity test. This assesses whether there are any two independent variables that are highly related (Wooldridge, 2015). This test was conducted using the variance inflation factors (VIF). The critical value for the VIF is 5. When an independent variable's VIF is below 5, this shows no signs of multicollinearity. However, when the value is above 5, this indicates presence of multicollinearity. The results are presented in Table 3.

Table 3: Multicollinearity Test

Variable	VIF	1/VIF
APT	1.61	0.621295
ART	1.60	0.624141
ITR	1.41	0.709035
CCC	1.24	0.808977
Mean VIF	1.46	

The study results provided in Table 3 indicate that the average VIF was 1.46. Amongst the study's independent variables, payables turnover ratio (APT) had the highest VIF with 1.61 whereas cash collection cycle (CCC) had the lowest VIF (1.24). Since none of the independent variables had a VIF of above 5, the conclusion was that there was no multicollinearity.

Test of Multicollinearity

When the model was fitted, the test of serial correlation was conducted. Linton (2017) argues that this is mostly relevant to macro panels with long time series of over 20 years. The implication is that autocorrelation or serial correlation inflates the r squared of the model and deflates the standard errors of the coefficients. In this study, Wooldridge test was used to assess serial correlation (Chandra & Sharma, 2013). The null hypothesis in this test is that there is no serial correlation, while the alternate is that there is serial correlation. The hypothesis is tested at 5% level of significance or 95% confidence level. Therefore,

the null hypothesis is accepted when the p value is above 0.05. The results of the test are provided in Table 4.

Table 4: Test Results for Serial Correlation

Woodridge Test for autocorrelation in panel data
H0: No first order autocorrelation
F (1, 5) = 2.21
Prob > F = 0.1271

The results indicated that the F value was 2.21 and the it was not significant at 5% level of significance (p = 1.1271). These results imply that with 95% confidence, we can accept the null hypothesis which indicates that there is no frost order autocorrelation. This indicated that the r squared estimates and the standard errors were accurate, efficient and reliable.

Test of Heteroscedasticity

The study conducted the assessment of homogeneity of variance of errors (homoscedasticity). After this test, the model was fitted. This was conducted on the residuals after the model was fitted. The study utilized the Breush-Pagan Cook-Wesiberg test of groupwise heteroskedasticity (Colomb et al., 2016). The null hypothesis of the test is that there is homoscedasticity, while the alternate hypothesis is heteroscedasticity. The null hypothesis was tested at p value of 0.05 and would be accepted when p value is above 0.05. Robust errors would be used if heteroscedasticity was present. The results of the test are provided in Table 5.

Table 5: Heteroscedasticity Test Results

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of ROA

         chi2(1)      =     2.16
         Prob > chi2  =   0.1420
```

The results provided in Table 5 established that the chi square value of the test was not significant at 5% level of significance (Chi square = 2.16, p = 0.1420). These results indicate that there was no evidence at 95% confidence to reject the null hypothesis. The implication of these findings is that there was no heteroscedasticity and hence homoscedasticity was assumed.

Test of Normality of Residuals

The last model specification test conducted was to assess the normality of the regression errors. This was conducted using the Shapiro Wilk test. After the model was fitted, residuals were generated and saved. Then Shapiro Wilk test was used to assess whether the residuals were normally distributed. The null hypothesis in the test is that the residuals are normally distributed. The hypothesis is tested at 5% level of significance and is accepted if the p value is above 0.05. The study results are provided in Table 6.

Table 6: Test Results for Normality of Residuals

Variable	Obs	W	V	z	Prob > z
Residuals	60	0.7954	1.397	0.644	0.1618

The results (Table 6) determined that the Shapiro-Wilk test (z = 0.644) was not significant with 95% level of confidence p = 0.1618). These results imply that the null hypothesis that the residuals were normally distributed could not be rejected at 5% level of significance. These findings hence implied that the residuals of the panel model were normally distributed.

Hausman Test

After satisfying all the panel data linear regression assumptions, the data was ready to be fitted in a panel model. However, to decide which model was appropriate, a Hausman was conducted. this tests indicates the most appropriate model between the fixed effects model and the random effects model. The results are provided in Table 7. The assumptions behind each of these models regards the correlation of unique entity factors with the study's independent variables. The fixed effects model assumes that the unique errors or characteristics of the panel units are correlated with the independent variables. The model hence controls for these factors so that the model will only indicate the net effect of the independent variables. The random effects model, one the other hand, assumes that these unique errors or time invariant characteristics are not correlated with the independent variables and hence they should play a role explanatory variables (Hilmer & Hilmer, 2013). The null hypothesis in the Hausman test is that random effects model is the one appropriate for the data. The alternate hypothesis is that fixed effects model is the best suited. The results of the Hausman test are provided in Table 7.

Table 7: Hausman Test Results

```
. hausman fixed random

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |    fixed        random       Difference          S.E.
-------------+------------------------------------------------------------
         CCC |   .2797738     .1406543        .1391195        .0331313
         ITR |   .2029094     .2696204        -.066711        .0144289
         ART |   .2207614     .2045441        .0162173               .
         APT |   1.119547     .3343771        .7851695         .166783
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       18.14
                Prob>chi2 =      0.0012
                (V_b-V_B is not positive definite)
```

Table 7 provides the results which indicate that the null hypothesis was rejected (chi square = 18.14, p = 0.0012). The implication of the findings is that the fixed effects model was appropriate for the study. This means that the time-invariant characteristics and the unique errors were correlated with the independent variables and hence their effects need to be controlled using the fixed effects model. Therefore, only the effect of the independent variables will be recorded in the model.

Fixed Effects Panel Model Results

This section provides the study findings from the fixed effects model that was fitted. The independent variables in the model were cash management (CCC), receivables management (ART), inventory management (ITR) and accounts payables management (APT). The study used the log of assets of the manufacturing firms as a control variable. This was informed by various empirical studies which had established that firm size (assets) may influence the working capital management practices employed by firms (Baños-Caballero et al., 2014; Kam & Shin, 2016; John, 2017; Akomeah, 2019). The dependent variable in the study was financial performance of manufacturing firms listed in the NSE which was measured using ROA. The results of the model are provided in Table 8.

Table 8: Fixed Effects panel Model Results

Fixed-effects (within) regression — Number of obs = 60
Group variable: Company — Number of groups = 6

R-sq: within = 0.4530 — Obs per group: min = 10
between = 0.1265 — avg = 10.0
overall = 0.2425 — max = 10

F(5,49) = 8.12
corr(u_i, Xb) = -0.4012 — Prob > F = 0.0000

FP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
CCC	-.0110011	.0206245	-0.53	0.596	-.0524476	.0304454
ITR	.5937157	.2745597	2.16	0.035	.0419673	1.145464
ART	.7052725	.3101745	2.27	0.027	.0819536	1.328592
APT	1.339855	.3100868	4.32	0.000	.7167119	1.962997
L_assets	-1.86015	2.469364	-0.75	0.455	-6.822523	3.102222
_cons	9.681947	15.85045	0.61	0.544	-22.17072	41.53461
sigma_u	2.9612842					
sigma_e	2.1333847					
rho	.65832226	(fraction of variance due to u_i)				

F test that all u_i=0: F(5, 49) = 5.00 — Prob > F = 0.0009

The study results provided in Table 8 indicate that the fixed effects model was a good fit and had some predictive power ($F = 8.12$, $p < 0.05$). This implies that the model was statistically significant and at least one of the independent variables had a significant effect on financial performance of manufacturing firms listed in the NSE. Besides, the Model explained 45.3% of the variation in variation in financial performance within the ten years (r squared within = 0.4530) and 12.65% of the variation between the six manufacturing firms listed in the NSE (r squared between = 0.1265). Additionally, the overall r squared indicates that if the ordinary least squares regression could have been applied, it could have explained 24.25% of the variation in financial performance in the manufacturing firms listed in the NSE (r squared overall = 0.2425).

The results in Table 8 revealed that the rime invariant effects and unique errors had a moderate negative association with the independent variables (corr u_i xb = -0.4012). The assumption that the correlation of unique entity factors with the study's independent variables was hence met. The fixed effects model assumes that the unique errors or characteristics of the manufacturing firms listed in the NSE are correlated with the independent variables, and hence, the model controls for these factors so that the model will only

indicate the net effect of the independent variables. The fixed effects model therefore catered fro these time invariant unique errors.

The results (Table 8) of the fixed effects model indicate that cash conversion cycle (CCC) did not have a significant influence on financial performance of manufacturing firms listed in the NSE ($\beta = -0.011$, $t = -0.53$, $p = 0.596$). This indicates that for the manufacturing firms listed in the NSE, increasing or decreasing the cash collection cycle is not expected to have a significant effect on the financial performance of the firms. These findings enabled the study to answer the first research question; What is the influence of cash management on financial performance of manufacturing firms listed in the Nairobi securities exchange? The study established that cash management did not have a statistically significant influence on financial performance of manufacturing firms listed in the NSE.

Results presented in Table 8 revealed that receivables turnover ratio (ART) had a significant positive effect on financial performance of manufacturing firms listed in the NSE ($\beta = 0.7053$, $t = 2.27$, $p = 0.027$). These findings indicate that a unit improvement in receivables turnover ratio would result to an increase in financial performance of 0.7053 and vice versa. Besides, these results enabled the study to provide answer to the second research question; what is the influence of receivables management on financial performance of manufacturing firms listed in the NSE? The study determined that receivables management had a significant positive influence on financial performance of manufacturing firms listed in the NSE.

Results (Table 8) on inventory management indicated that inventory turnover ratio (ITR) had a significant positive influence on financial performance of manufacturing firms listed in the NSE ($\beta = 0.5937$, $t = 2.16$, $p = 0.035$). This indicates that for the manufacturing firms listed in the NSE, enhancing inventory turnover ratio by one unit would result in an improvement in financial performance by 0.5937% and vice versa. These findings enabled the study to answer the third research question; What is the influence of inventory management on financial performance of manufacturing firms listed in the NSE? The study determined that inventory management had a significant positive influence on financial performance of manufacturing firms listed in the NSE.

Lastly, the study (Table 8) established that accounts payable turnover ratio (APT) had a significant positive effect on financial performance of manufacturing firms listed in the NSE ($\beta = 1.3399$, $t = 4.32$, $p < 0.05$).

These findings indicate that a unit improvement in accounts payables turnover ratio would result to an increase in financial performance of 1.3399% and vice versa. Additionally, the study findings indicated that this was the most significant factor among the four working capital management factors included in the study. Besides, these results enabled the study to provide answer to the last research question; what is the influence of accounts payables management on financial performance of manufacturing firms listed in the NSE? The study determined that accounts payables management had a significant positive influence on financial performance of manufacturing firms listed in the NSE.

Discussion of Findings

The study results indicate that cash management did not have a significant influence on financial performance of manufacturing firms listed in the NSE ($\beta = -0.011$, $t = -0.53$, $p = 0.596$). These findings did not support the cash conversion theory by Gitman, Bacon and Joehnk (1984) which explains that the cash cycle of the firm affects the cash available for operations and investment and hence influence the firm's operations, financial performance and competitiveness. Though the cash conversion theory provides the explanation regarding the link between cash management of the business, its operations, its financial performance and its working capital elements, the findings from this study did not give credence to the theory.

The study disagrees with the findings by Bari, Muturi, Mohamed and Samantar (2019), who established that for a business to be profitable and sustainable, proper cash management is necessary. The research was conducted in Somalia on food and beverage retailers and established that cash conversion cycle had a positive significant relationship to business performance. the study findings also disagree with the findings by Afrifa (2016) that cash management and net working capital affects financial performance. Other studies which have findings that contradict the current study include Robinson and Sensoy (2016) and Ndirangu (2017). These studies established that cash conversion cycle positively impacts financial performance.

Some studies support the findings from this study that indicate that cash management is not important when making financial performance decisions, as liquidity management is not vital to good financial performance. Such studies include a study by Muraya (2018) which established that operating cash flows had a statistical insignificance effect on profit after tax. Besides, the study by Murigu, Kiragu and Kiai

(2018) had results that were similar to the results from this study. This study indicated that there was no significant relationship between cash management and financial performance of hotel businesses.

The study findings indicated that receivables management had a significant positive effect on financial performance of manufacturing firms listed in the NSE ($\beta = 0.7053$, $t = 2.27$, $p = 0.027$). These findings support the operating cycle theory by Long, Malitz and Ravid (1993) which explains that the number of days required to turn receivables into cash is critical to provide the needed liquidity in the firm for its operations and performance. The findings on the positive influence of receivables management on financial performance supports the proposition that the changes effected by the organization to the credit policy directly influences the average outstanding days on the balance dues. This eventually affects the liquidity position of the firms, its operations and ultimately its financial performance. The findings of a positive relationship between receivables management and financial performance contradicted the findings by Bari, Muturi, Mohammed and Samantar (2019) who determined that receivables turnover ratio had an inverse correlation with business performance. The results of a positive effect of receivables turnover on financial performance concurs with the results by Agnes and Mutiso (2019) who conducted a study on manufacturing companies in Kiambu County to determine the effect of receivables management on the performance of manufacturing SMEs in the county.

Results on inventory management indicated that inventory turnover ratio had a significant positive influence on financial performance of manufacturing firms listed in the NSE ($\beta = 0.5937$, $t = 2.16$, $p = 0.035$). These findings supported the transaction cost theory by Coase (1937) which explains the transaction costs of the firm and how they are aimed at producing value for the firm.

The findings on the positive effect of inventory management on financial agrees with the findings by Bari et al. (2019) who concluded that inventory management was an important factor in food and beverage businesses' financial performance. The results also concur with the results by Kipkirui (2018) who carried out an investigation on Kenyan manufacturing firms to find out the impact of optimal inventory orders on firms' performance. The findings on inventory management also agrees with other studies such as Mwangi (2015) and Shire, Dhodi and Ahmed (2018) who both established that inventory management practices in any given firm impacts its financial performance.

However, the findings of the positive effect of inventory management on financial performance contradicts several studies. For instance, the study contradicts the findings by Elsayed and Wahba (2017) and Gorondutse, Ali and Ali (2016).

The study established that accounts payable turnover ratio had a significant positive effect on financial performance of manufacturing firms listed in the NSE ($\beta = 1.3399$, $t = 4.32$, $p < 0.05$). These findings supported the value chain theory by Rappaport's (1986). The findings supported two major principles of the value chain theory which are the management of accounts payables and the aspect of creation of shareholder value and firm performance. Management of accounts payables has an effect on profitability and cash flows of the firm as it determines the inflows and outflows of cash into and outside the firm to suppliers.

The study finding agree with findings by Nwakaego and Ikechukwu (2019) who conducted a study to determine how financial performance is affected by control of accounts payable in domestic manufacturing organizations in Nigeria. The research outcomes also concur with the findings by Judith and Muturi (2018) who investigated the impact of working capital management on financial performance of Kisii County hospitals.

Conclusions and Recommendations

Introduction

This chapter provides a summary of the study findings, the study conclusions, and the recommendations of the study. These are provided based on the study's objectives which were to; establish the influence of cash management on financial performance of manufacturing firms listed in the NSE, examine the influence of receivables management on financial performance of manufacturing firms listed in the NSE, determine the influence of inventory management on financial performance of manufacturing firms listed in the NSE and assess the influence of accounts payables management on financial performance of manufacturing firms listed in the NSE. The caper also provided limitations of the study and suggestion for further research on working capital management.

Summary

The results determined that cash conversion cycle did not have a significant influence on financial performance of manufacturing firms listed in the NSE (β = -0.011, t = -0.53, p = 0.596). The implication of these findings are that for the manufacturing firms listed in the NSE, increasing or decreasing the cash conversion cycle is not expected to have a significant effect on the financial performance of the firms. The findings suggest that firms should focus on addressing other aspects of working capital which are associated with cash such as inventory, payables and receivables. These findings enabled the study to answer the first research question; What is the influence of cash management on financial performance of manufacturing firms listed in the Nairobi securities exchange? The study established that cash management did not have a statistically significant influence on financial performance of manufacturing firms listed in the NSE.

Study results on receivables management determined that receivables turnover ratio (ART) had a significant positive effect on financial performance of manufacturing firms listed in the NSE (β = 0.7053, t = 2.27, p = 0.027). These findings indicate that a unit improvement in receivables turnover ratio would result to an increase in financial performance of 0.7053 and vice versa. Besides, these results enabled the study to provide answer to the second research question; what is the influence of receivables management on financial performance of manufacturing firms listed in the NSE? The study determined that receivables management had a significant positive influence on financial performance of manufacturing firms listed in the NSE.

On inventory management study results indicated that inventory turnover ratio had a significant positive influence on financial performance of manufacturing firms listed in the NSE (β = 0.5937, t = 2.16, p =0.035). This indicates that for the manufacturing firms listed in the NSE, enhancing inventory turnover ratio by one unit would result in an improvement in financial performance by 0.5937% and vice versa. These findings enabled the study to answer the third research question; What is the influence of inventory management on financial performance of manufacturing firms listed in the NSE? The study determined that inventory management had a significant positive influence on financial performance of manufacturing firms listed in the NSE.

Lastly, the study results on payables management established that accounts payable turnover ratio had a significant positive effect on financial performance of manufacturing firms listed in the NSE (β = 1.3399, t

= 4.32, $p < 0.05$). These findings indicate that a unit improvement in accounts payables turnover ratio would result to an increase in financial performance of 1.3399% and vice versa. Additionally, the study findings indicated that this was the most significant factor among the four working capital management factors included in the study. Besides, these results enabled the study to provide answer to the last research question; what is the influence of accounts payables management on financial performance of manufacturing firms listed in the NSE? The study determined that accounts payables management had a significant positive influence on financial performance of manufacturing firms listed in the NSE.

Recommendations

On receivables management front, the study recommends management to institute effective credit management practices to increase their receivables turnover ratio to the maximum practicable so as to optimize their relationships with their debtors as this component of working capital was found to a significant driver of financial performance. Regarding inventory management, the study recommends that management should put pay attention to key inventory management performance metrics including inventory turnover ratio as the research results shows inventory management is a significant contributor to financial performance of the firms covered by the study. The study also recommends that manufacturing firms should optimize their payables management since the variable was found to have a significant effect on the financial performance.

Recommendations for Future Research

This study recommends future research on influence of working capital management on financial performance of firms outside the manufacturing sector. Such firms should include retailers in Kenya which have experienced working capital challenges fuelled by incapacity to settle their accounts payable in time. Most of the past studies have focused more on inventory, cash and receivables management and focused little on accounts payables management. Future studies should put emphasis on this component of working capital since it has emerged to be a critical factor in performance and sustainability of firms in different sectors.

The study focused on the manufacturing firms listed in the NSE. Since the findings may not be generalizable to other smaller manufacturing firms, a study should be conducted on the small and medium manufacturers.

Small and medium manufacturers form the bulk of the firms in the manufacturing sector and their performance and sustainability is critical for the attainment of Vision 2030 and Big 4 Agenda.

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