

## Working Capital Management and its Effect on Financial Performance of Public Universities in Coastal Region Kenya

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### Abstract

*Kenya's public universities face challenges such as budget cuts and declining enrollments. This puts pressure on institutions and highlights the need for strong financial management systems. The main goal of this research was to assess the influence of working capital management (WCM) on financial performance (FP) of coastal public universities in Kenya. The effects of cash, accounts receivable, accounts payable, inventories and the size of the university on financial performance were examined. The study utilized primary and secondary data analysis involving financial controllers and managers for primary data collection. Secondary data from 2013 to 2019 was also collected from financial reports of selected universities. The findings of this study demonstrated the beneficial effect of working capital management on financial performance. The study highlights the importance of implementing tailored financial management strategies for each institution based on their specific needs and size. Recommendations include focusing on cash management, improving receivables and payables management, optimizing inventory strategies, and considering university size when designing working capital approaches.*

**Keywords:** Public Universities, Financial Performance, Working Capital Management

### INTRODUCTION

The fundamental concept of working capital focuses on the efficient management of a business entity's current assets and liabilities with the aim of improving financial performance and mitigating risks associated with bankruptcy or potential financial challenges that could develop (Sogomi et al., 2024). Effective working capital management (WCM) plays a crucial role in influencing the financial performance (FP) of companies across various sectors. According to a study conducted by Deloof (2023), it has been found that effective working capital management (WCM) can significantly improve a company's financial performance. This is accomplished by reducing the need for external financing and minimizing financing expenses. A study conducted by Shin and Soenen (2018) also pointed out a strong positive relationship between profitability and WCM, suggesting that companies that manage their working capital more effectively tend to achieve higher returns. The most recent study by Agha et al. (2018) confirms these results and shows the higher profitability rates of companies with efficient WCM. This means that improving WCM techniques can ensure a company's long-term profitability and improve financial performance.

Furthermore, effective WCM contributes to increased liquidity, which is necessary for both keeping operations running smoothly and fulfilling short-term financial obligations. Research by Filbeck and Krueger (2005) suggests that companies with a better liquidity position achieved through effective WCM are better equipped to deal with unexpected expenses and economic downturns. Siddiqui et al. (2020) further emphasize that adequate liquidity, resulting from optimal WCM, enables companies to take advantage of investment opportunities and navigate through volatile market conditions. Recent studies by Aziz et al. (2020) and Eljelly (2004) also support these results and show a positive relationship between WCM and liquidity ratios. Therefore, by maintaining optimal working capital levels, companies can improve their liquidity position, mitigate financial risks and improve overall financial performance.

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Moreover, effective WCM contributes to improving operational efficiency and reducing costs, ultimately enhancing profitability. Raheman and Nasr (2007) found that firms with efficient WCM practices experience lower operating expenses, as they minimize the costs associated with holding excess inventory and extending credit to customers. Recent research by Wang et al. (2019) further confirms this relationship, demonstrating that firms with better WCM exhibit higher profit margins. Additionally, Dang and Nguyen (2020) suggest that effective management of working capital enables firms to optimize their production and sales processes, leading to higher revenue generation and improved profit margins. Therefore, by implementing sound WCM strategies, businesses can reduce costs, increase operational efficiency, and ultimately boost profitability, thereby driving overall financial performance.

Furthermore, efficient WCM can positively impact a company's growth prospects and investment decisions. Gill et al. (2010) suggest that firms with effective WCM practices are better positioned to fund growth initiatives, such as expansion projects or new product development, without relying heavily on external financing. Recent research by Qaiser et al. (2018) supports these findings, demonstrating that firms with efficient WCM are more likely to invest in growth opportunities. Additionally, Afza and Nazir (2008) found a positive relationship between WCM efficiency and firms' ability to attract external financing. Therefore, by maintaining efficient WCM practices, companies can enhance their access to capital, support growth initiatives, and improve overall financial performance.

The expansion of universities in Kenya, particularly in the public sector, has led to increased competition for students and resources, resulting in financial challenges for these institutions. Kilonzo et al. (2021) highlight the negative impact of unregulated university growth on tuition revenue, which has been exacerbated by recent budget cuts and reduced enrollment. This situation has put pressure on public universities to manage their working capital effectively, including accounts receivable, accounts payable, and inventory levels. The looming financial crisis faced by public universities underscores the urgent need for strategic financial management to ensure their sustainability. Geiger (2010) warns of the potential closure of institutions facing financial crises, drawing parallels with challenges seen in American higher education. Discussions on restructuring higher education in Africa, as noted by Zeleza (2019), highlight the complexities embedded in socio-economic disparities, organizational shortcomings, and historical factors influencing financial challenges faced by institutions.

The core objective of any organization, including universities, is to maximize shareholders' wealth, which involves optimizing profitability while balancing liquidity needs (Werner & Stoner, 2018). Effective WCM plays a crucial role in achieving this goal by ensuring the right balance between current assets and liabilities. Oundo (2017) emphasizes the importance of WCM in analyzing business performance, as an imbalance between current assets and liabilities can significantly affect profitability. This highlights the critical role of proper WCM in mitigating financial constraints faced by public universities in Kenya.

Munene (2019) underscores the poor financial performance of public universities in Kenya, raising concerns about their long-term sustainability. The Technical University of Mombasa, among others, faces sectorial challenges contributing to financial instability. To address these challenges, public universities must prioritize effective WCM. Proper management of accounts receivable policies, particularly optimizing fee collection from students, is essential for ensuring sufficient cash flow to meet short-term financial obligations. Restructuring accounts receivable policies can help public universities in Kenya overcome their financial crisis and enhance their overall performance in terms of finances.

## **LITERATURE REVIEW**

### **THEORETICAL FRAMEWORK**

Main theories to be adopted by the study were Cash Conversion Cycle Theory, Keynesian Liquidity Preference theory, Theory of Budgeting and Transactions Cost Economics Theory.

### **CASH CONVERSION CYCLE**

The cash conversion cycle was proposed by Gitman (1974) as a means of managing a company's working capital and its impact on corporate liquidity. The theory functions as part of the operating cycle by summing inventory periods and accounts receivable minus accounts payable. The theory focuses on the period from the acquisition of raw materials to receipt of inflows from the sale of the final products. The theory thus encompasses the relationships between all components of WCM and the cash inflow. It can therefore be used to determine the amount of money required for a given level of sales (Gitman, 1974).

Based on this theory, it is desirable that cash be scarce and have fewer components (Narwal & Jindal, 2017). This can be achieved by shortening the inventory conversion periods and the account receivables collection period. This ensures that fewer resources are required, as opposed to a longer cash conversion cycle. A shorter CCC therefore leads to better profits for the company, but the other processes must also be taken into account. However, other studies have shown that a longer cycle would be profitable because additional investments may be internal to the company and therefore provide faster returns (Chang, 2018).

Cash Conversion Cycle (CCC) theory suggests that efficient management of working capital, particularly in terms of reducing the time it takes to convert inventory into sales and then into cash, leads to improved financial performance. This theory focuses on minimizing the time between cash outflow for inventory purchases and cash inflow from sales. By shortening the CCC, companies can optimize their liquidity position, reduce the need for external financing and reduce operating costs. As a result, companies with shorter CCCs are better able to capitalize on investment opportunities, mitigate financial risks, and ultimately improve their overall performance.

The theory provides a framework for understanding the relevance of the time in days it takes a firm to convert its resource inputs into cash (Zakari & Saidu, 2016). The theoretical basis for the study is that public universities should shorten their cash conversion cycle. This allows the managers of these universities to ensure the maximization of shareholder value in the shortest possible time. On the contrary, a higher CCC tends to result in lower returns due to the longer duration as cash may be tied to interest-free accounts. Therefore, the performance of public universities will only increase if there is a shorter cash conversion cycle.

### **LIQUIDITY PREFERENCE THEORY**

John Maynard Keynes proposed the liquidity preference theory in 1936. According to the theory, the desire for liquidity drives the demand for money, not the need to borrow it. The original purpose of the model idea was to clarify the guarantee of the interest rate in relation to the supply and demand of cash (Nyabwanga, 2011). The theory explains three basic reasons why individuals or organizations should demand and prefer cash flow. This also includes the expected needs, i.e. H. developing the organization's ability to take advantage of unique opportunities that can be beneficial to the company.

Liquidity preference is the need for cash measured by its liquidity (Vercelli, 2018). Therefore, according to the liquidity preference theory, the demand for money is the basis for liquidity. The theory also explains the role of the interest rate through the supply and demand of money (Lavoie & Reissl, 2019). The importance of the theory is that it helps explain why there may be different levels of liquidity at public universities. The theory goes on to explain the reasons why these universities are likely to choose to keep cash on hand. However, the theory does not adequately describe liquidity preference.

Liquidity preference theory emphasizes the importance of maintaining adequate levels of liquidity to meet short-term obligations. According to this theory, companies that prioritize liquidity over other investment opportunities tend to have a lower risk profile and higher financial stability. By ensuring sufficient cash reserves and liquid assets, companies can protect themselves from unforeseen financial challenges and take advantage of potential investment opportunities. While too high a level of liquidity can lead to lower returns, maintaining a balance between liquidity and profitability is crucial to optimizing overall performance.

### **OPERATING CYCLE THEORY**

The cash conversion cycle theory and operational cycle theory are credited to Richards and Laughlin (1980), who are regarded as their primary contributors. They pointed out that two key factors in comprehending a

firm's financial flows are the use of receivables and the availability of inventory turnover data in the operational cycle. A company must evaluate the value of the statement of financial position and the statement of income from the firm's operating activities in order to determine its liquidity.

Accounts receivable turnover measures how frequently the average receivable investment of the company is converted into cash. Any time credit and collection practices are altered, the average amount of unpaid accounts receivable as a percentage of the company's annual sales is immediately influenced. Businesses offer consumers more flexible terms, which results in a bigger and maybe less liquid current investment in receivables and most likely deterioration of liquidity. The company's dedication to the long-term maintenance of bigger average receivables investments leads to higher current and acid-test ratios (Richards & Laughlin, 1980).

An approximation of the length of an organization's operating cycle can be made using the total number of days per sales for inventory investments and accounts receivable. The company can create a more accurate representation of its liquidity position by incorporating these asset rotations into an operating cycle model of the current asset conversion period. The operating cycle model is not a reliable indicator of cash flow because it disregards the liquidity requirements imposed on a business by the time dimension of its short-term liabilities and obligations.

By employing strategies that place a strong emphasis on the company providing inventory per dollar of expected sales, modern companies aim to reduce turnover rates. Using these tactics in the company's purchasing, production, and sales departments results in longer holding periods and potentially less inventory that can be easily converted into cash. Decisions that result in an extended period or shorter period of maintaining liquid inventory, supported by greater liquidity ratio indicators, prevent firms from changing their recourse to short-term debt capital or settlement practices (Weston & Eugene, 1979). Due to the comprehensive operating cycle view of the management of liquidity, a growing number of firms are integrating accounts receivable and inventory turnover metrics.

Operating Cycle Theory focuses on the relationship between a company's operating cycle and its WCM. It suggests that firms with shorter operating cycles, characterized by faster inventory turnover and shorter receivables collection periods, tend to be more efficient in managing their working capital. By reducing the time, it takes to convert raw materials into finished goods and subsequently into cash, companies can improve their cash flows and profitability. Shortening the operating cycle allows firms to reinvest cash more quickly, enhancing overall performance and competitiveness in the market.

## **TRANSACTIONS COST ECONOMICS THEORY**

This theory was advanced by Commons (1934). The expenses incurred in maintaining the financial system are known as transaction costs. Later, the theory was adapted to numerous fields, including Transaction-Cost Economics (TCE) theory. Coase (1988) suggests that there are costs associated with conducting market transactions. Neoclassical economic theory generally fails to adequately address and explain economic facts, which gives rise to TCT (Akbar, & Tracogna, 2018). The theory asserts that both external and internal considerations should be taken into account before engaging in any transaction. As a result, potential solutions are developed while the numerous hazards that are bound to result from the transactions are assessed.

TCT therefore emphasizes efficiency and sees economic structure as primarily focused on the relative effectiveness of reducing transaction costs (Wiesner, 2017; Zylbersztajn, 2018). The study makes the assumption that the top management and key decision-makers will not act logically in any transactions. As a result, the theory's premise is that universities would prefer transactions to be organized within the firm if doing so would be less expensive than doing so on the open market. According to the study, this theory is crucial for describing how organizations behave in relation to the working capital policies that colleges should follow.

Transactions Cost Economics Theory argues that firms engage in WCM practices to minimize transaction costs associated with financing and operational activities. According to this theory, firms aim to strike a balance between the costs of holding excess working capital and the costs of financing shortages. By optimizing their working capital levels, companies can minimize the costs associated with external financing, such as interest

expenses, while also avoiding stockouts and disruptions in operations. Effective WCM reduces transaction costs, thereby improving financial performance and enhancing shareholder value.

## **EMPIRICAL REVIEW**

According to Horne and Wachowicz (2000), cash is the most liquid asset that a company owns and therefore the company needs to understand its cash conversion cycle. In his study, Onyando (2018) aimed to evaluate and determine how cash management affects the financial performance of SMEs in Nakuru. The independent variables he focused on were bank, cash, and credit management. The dependent variable he measured was financial efficiency, specifically using the net profit margin. The study was conducted across Nakuru County. The results of the study showed that SMEs carried out timely reconciliations and regular banking transactions. The researcher was also able to determine that debt collection and debtor inventories have a negative relationship with profits.

Nyabwanga et al. (2016) identified that a majority of small and medium enterprises encountered challenges with cash flow stemming from inadequate cash management practices, leading to subpar financial performance. Their research revealed a lack of adherence to regular WCM among these enterprises. Maduga and Ogbomnaya (2018) delved into an study regarding the influence of WCM on the financial performance of corporations within the Gulf Cooperation Council. Their study scrutinized variables such as cash, inventory, accounts receivable, and creditor management, with the findings indicating a substantial association between cash management and financial performance.

According to Wasike's (2019) investigation, a significant correlation was uncovered among trade debtors and financial performance. The outcomes demonstrated an converse association between the average collection period and Return on Equity (ROE), a positive correlation between accounts receivable turnover ratio and ROE, and a noteworthy impact from the geographic size. The regression model formulated subsequent to accounting for all factors highlighted that the average collection period, accounts receivable turnover, and geographic size had adverse effects on financial performance, as gauged by ROE. In order to enhance their financial performance, firms are advised to diminish their average collection period and accounts receivable turnover.

According to Shurie and Cheluget's (2022) study, management of inventory had a direct and statistically insignificant effect on the financial performance of Kenyan enterprises. The study proposed that in order for businesses to improve their financial performance, they should improve their receivable management procedures by seeking prompt payment from their customers. The study also suggested that businesses embrace best practices for inventory management, such as adopting methods like economic order quantities, to ensure that they always have the right quantities of inventory on hand. Receivables are collected more efficiently when customers are charged interest for delayed payments. In terms of how a business assesses its credit sales, the period of time it takes for customers to pay also determines how fast receivables are collected (Ngari & Kamau, 2022).

According to the research by Nyantika et al. (2022), accounts receivable established a significant but positive correlation with the financial performance of Kenyan agricultural enterprises that were publicly listed. Therefore, the financial performance of listed corporations in Kenya significantly declined as a result of the change in accounts receivable. These results deviated from those of Mutiso and Mwangi (2019), who observed that account receivables have a strong but indirect relationship with profitability, credit conditions, and standard of credit. However, the study revealed an uncertain and opposite correlation between credit selection and profitability.

According to Ogutu (2022), each proposed policy's effect on revenue losses and increased sales should be compared against the cost of funds tied up in bad debt losses, collection charges, receivables, and missed cash discounts. Sometimes businesses are ready to take a loss on higher sales in order to benefit from a new policy. When businesses implement a specific credit policy, they can gain access to a previously closed market.

Descriptive research was used in this study by Munene and Tibbs (2019) to examine the association among the variables. The accounts and finance departments provided the secondary data for the research. The data were

analyzed using descriptive statistics and inferential statistical methods. The results were subsequently presented in tables. Wasike's (2019) study employed an explanatory research design and collected data from secondary sources. Regression and correlation analyses were utilized to examine the data. Receivables were monitored using the average collection period, while financial performance variables were based on return on equity (ROE).

Owuor et al. (2021) conducted a financial analysis using bank records to gather data. The data consisted of information on accounts receivable balances, total loans and committed contributions, as well as surpluses and deficits. The researchers evaluated the FP of the organizations by analyzing the surpluses and deficits, and assessed trade receivables management using the average collection period (ACP). However, it should be noted that this study did not take into account factors within the institutional framework, such as student protests, that could potentially affect the ACP of these institutions. This limitation is due to the lack of empirical data from audited annual financial statements that would provide insights on such matters.

Ritchie and Kolodinsky (2003) argue that financial performance measurement is still a challenge for both researchers and nonprofit organization (NPO) practitioners, in part because there aren't enough empirical studies of both new and old measures. They grouped the performance criteria into three categories: public support, fundraising effectiveness, and financial performance. There are four main ratios that can be used to determine whether a NPO has sufficient resources to carry out its objectives (Abraham, 2004).

According to Leonard (2014), the primary drivers of NSE-listed companies' financial performance are debt and equity. Additionally, there is evidence of a significant and negative relationship between capital structure and all performance measures, indicating that the more debt a company uses, the worse off it will be financially. Comparable research by Pouraghajan (2012), Nimalathasan (2010), and Ebaid (2009) revealed little to no effect, a significant negative relationship between debt ratio and financial performance, and a positive and strong relationship between debt and financial performance. Iorpev and Kwanum (2012) conducted a similar study that revealed a weak and negative correlation between total long-term debt, total short-term debt, ROA, and profit margin.

A study by Singh (2008) on the relationship between inventory management and financial performance concluded that poor inventory management practices led to serious challenges that, in the long run, reduced their long-term profitability while negatively impacting their chances of survival. Additionally, companies with efficient inventory management practices maintain their inventory levels at optimal levels, which in turn has had a positive impact on sales volumes and production. The study concluded that inventory size has a direct impact on financial performance.

## **RESEARCH METHODOLOGY**

### **DATA COLLECTION**

There are currently around 30 public universities and colleges in Kenya offering various programs, services and specializations. However, the research focused on the three public universities in the coastal region. The universities examined are: Technical University of Mombasa (TUM), Pwani University (PU) and Taita Taveta University (TTU). The choice of these universities is due to the fact that little research has been done on them in this area of study. This creates a gap that needs to be explored.

The study used secondary data and primary data collection techniques where appropriate. Structured questionnaires designed keeping in mind the research objectives were used to collect primary data. Questionnaire items were rated on a five-point Likert scale: 5 for total disagreement, 4 for disagreement, 3 for undecided or neutral, 2 for agreement, and 1 for strong agreement. The financial reports of the target universities provided secondary data.

### **PANEL MODELS**

The format of the relationship between the independent and dependent variables is displayed in the following Equations 3.1 and 3.2., with the measures of financial performance being Z Score and Glover model respectively.

$$Y_{zs} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \varepsilon \tag{3.1}$$

$$Y_g = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \varepsilon \tag{3.2}$$

To estimate the moderating effect of university size on public universities' WCM and financial performance, the extended models shown in Equation 3.3, Equation 3.4 and Equation 3.5 below were used, where the measures of university size were capital adequacy ratio, number of students and number of employees. This was achieved by running a moderated panel model.

$$Y_{zs.g} = \beta_0 + \beta_1(X_1 Z_{1t}) + \beta_2(X_2 Z_{1t}) + \beta_3(X_3 Z_{1t}) + \beta_4(X_4 Z_{1t}) + \varepsilon \tag{3.3}$$

$$Y_{zs.g} = \beta_0 + \beta_1(X_1 Z_{2t}) + \beta_2(X_2 Z_{2t}) + \beta_3(X_3 Z_{2t}) + \beta_4(X_4 Z_{2t}) + \varepsilon \tag{3.4}$$

$$Y_{zs.g} = \beta_0 + \beta_1(X_1 Z_{3t}) + \beta_2(X_2 Z_{3t}) + \beta_3(X_3 Z_{3t}) + \beta_{4t}(X_4 Z_{3t}) + \varepsilon \tag{3.5}$$

Where;

$Y_{zs}$  = financial performance (measured by Altman's Z-Score)

$Y_g$  = financial performance (measured by Grover model)

$Y_{zs.g}$  = financial performance (measured by Altman's Z-Score and Grover model)

$X_1$  = Cash Management

$X_2$  = Accounts receivables

$X_3$  = Accounts Payables

$X_4$  = Inventory Management

$Z_1$  = Moderating factor, university size measured by Capital adequacy ratio

$Z_2$  = Moderating factor, university size measured by number of students

$Z_3$  = Moderating factor, university size measured by number of staff

t= time denotation

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$  are the various intercepts of the respective independent variables.

## RESEARCH FINDINGS AND DISCUSSIONS

### TEST FOR NORMALITY

To check for normality, the Shapiro-Wilk and Kolmogorov-Smirnova tests were utilized. The relationship between the data and the corresponding normal scores serves as the foundation for the Shapiro-Wilk Test (Peat & Barton, 2005). For this reason, even after a significant correlation, the Shapiro-Wilk test outperforms the Kolmogorov-Smirnov test in assessing normality. Table 1 demonstrates that the p-values of the variables were below 0.05. Based on the rejection of the null hypothesis that the data was not normal, a conclusion can be made that the data is normally distributed.

Table 1 Normality Test-Kolmogorov-Smirnova and Shapiro-Wilk

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Cash Management	0.082	21	.000*	0.979	21	0.010
Accounts Receivable	0.204	21	0.023	0.942	21	0.002

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Accounts Payable	0.156	21	0.001	0.933	21	0.000
Inventory	0.193	21	0.000	0.913	21	0.001
Size	0.183	21	0.003	0.894	21	0.026
Financial Performance	0.139	21	.001	0.943	21	0.001

### TEST FOR MULTICOLLINEARITY

Tests for multicollinearity were performed on the regression model to prevent incorrect conclusions being drawn regarding the relationship between the predictor and the dependent variables. To show whether a multicollinearity test was present, the Variance Inflation Factor (VIF) and the tolerance level were used. Table 2 shows the results. Multicollinearity occurs when the tolerance is less than 0 point 1 and the VIF is more than 10. However, the measurements were within an acceptable range for each variable, meaning that multicollinearity was not a problem.

**Table 2 Multicollinearity Test**

Variable	Tolerance	VIF
Cash Management	0.392	2.553
Accounts Receivable	0.534	1.873
Accounts Payable	0.538	1.860
Inventory	0.301	3.321
Organizational Size	0.417	1.215

### REGRESSION ANALYSIS

#### SPSS ANALYSIS OF PRIMARY DATA

To assess the effect of WCM on financial performance (FP), a regression analysis was performed. The findings are presented in Table 3, indicating that the analysed WCM strategies explain 82.6 percent of the variations in the FP of Kenyan public universities in the Coast region. This correlation is supported by an adjusted R-squared value of 0.826. Consequently, the remaining percentage (17.4%) takes into account other factors that were not included in the study.

**Table 3 Coefficients**

Model	Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	t	
1	(Constant)	1.811	0.599		3.023	0.008
	Cash Management	0.516	0.229	0.336	2.251	0.039
	Accounts Receivable	0.020	0.133	0.019	0.149	0.004
	Accounts Payable	0.104	0.117	0.113	0.888	0.008
	Inventory	0.708	0.217	0.555	3.263	0.005

a. Dependent Variable: Financial Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.928 <sup>a</sup>	0.860	0.826	0.29385

According to Table 3, among the financial management factors considered in the model, cash management emerges as an important predictor of FP. The unstandardized coefficient for cash management (B = 0.516, Std. Error = 0.229, Sig. = 0.039) indicates a positive relationship with FP. This suggests that improvements in cash

management practices are associated with increases in FP, as evidenced by the standardized coefficient (Beta = 0.336).

Furthermore, trade receivables also show a statistically significant impact on FP in the regression model. Despite a small unstandardized coefficient (B = 0.020, Std Error = 0.133, Sig = 0.004), its standardized coefficient (Beta = 0.019) indicates a positive relationship with FP. This suggests that even modest improvements in receivables management can contribute to improved financial results.

Conversely, trade payables in the regression model have a statistically insignificant impact on FP. The unstandardized coefficient for trade payables (B = 0.104, standard error = 0.117, sig. = 0.008) suggests a relatively small and insignificant association with FP. This indicates that changes in accounts payable management may not greatly affect the overall FP in the data set that was examined.

Additionally, inventory management proves to be an extremely important indicator of FP. The significant unstandardized coefficient for inventory management (B = 0.708, std error = 0.217, sig = 0.005) indicates a strong positive relationship. This suggests that effective inventory management practices play a crucial role in improving FP within the analyzed data set, as indicated by the standardized coefficient (Beta = 0.555). Overall, the regression model highlights the importance of strategic financial management decisions, particularly in optimizing cash flow, accounts receivable, accounts payable and inventory control, to achieve improved financial results in the context of the studied data set. These results highlight specific areas where improvements in financial management practices can lead to tangible benefits in terms of overall financial performance.

**SPSS MODERATED REGRESSION ANALYSIS USING PRIMARY DATA**

The study also aimed to find out how firm size, a moderating variable, affects the correlation between WCM and FP of Kenya's government owned universities in the coastal region. Below is a summary of the regression model based on a comparative analysis of the data.

**Table 4 Moderated Model coefficients**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-1.503	0.788		-1.907	0.081
Cash Management	1.531	2.096	0.996	0.730	0.009
Accounts Receivable	1.533	1.292	1.473	1.186	0.008
Accounts Payable	1.164	1.029	1.269	1.132	0.000
Inventory	2.743	2.076	2.152	1.321	0.011
Cash Management size interaction	0.516	0.574	1.971	0.899	0.000
Accounts Receivable and size interaction	0.421	0.366	1.942	1.152	0.003
Accounts Payable and size interaction	0.375	0.313	1.707	1.199	0.000
Inventory size interaction	0.549	0.588	2.287	0.934	0.000
<i>a Dependent Variable: Financial Performance</i>					
R	R Square		Adjusted R Square	Std. Error of the Estimate	
.948a	0.899		0.871	0.28890	

The results presented in Table 4 show that when examining the individual effects of financial management factors, it is found that all variables, including cash management (B = 1.531, standard error = 2.096, beta = 0.996), accounts receivable (B = 1.533), standard error = 1.292, beta = 1.473), accounts payable (B = 1.164, standard error = 1.029, beta = 1.269) and inventory (B = 2.743, standard error = 2.076, beta = 2.152). Relationships with FP. These coefficients are all significant statistically at the traditional level of significance (p < 0.05), suggesting that improvements in these financial management practices are associated with increases in financial performance.

Furthermore, all interaction coefficients are statistically significant when considering the interaction terms between financial management factors and university size. The interaction terms include the interaction of cash management size (B = 0.516, standard error = 0.574, beta = 1.971), the interaction between accounts receivable and size (B = 0.421, standard error = 0.366, beta = 1.942), the interaction between accounts payable and Size (B = 0.375, std error = 0.313, beta = 1.707) and the inventory size interaction (B = 0.549, std error = 0.588, beta = 2.287) all show positive relationships with financial performance.

These results suggest that the influence of WCM practices on FP is moderated by the size of the university. The positive effect of cash management, accounts receivable, accounts payable, and inventory management on FP is particularly pronounced as the size of the university increases. This suggests that larger universities may reap greater benefits from implementing effective financial management practices compared to smaller institutions. Overall, the moderated regression model provides valuable insights into the complex interaction of financial management factors and university size in determining financial performance. These results highlight the importance of considering organizational context, such as university size, when analysing the effectiveness of financial management practices in achieving desired financial outcomes.

**STATA PANEL DATA ANALYSIS WITH ALTMAN Z SCORE AS THE DEPENDENT VARIABLE**

The objective of the study was to use secondary data to determine the association between WCM and FP of Kenyan government owned universities in the coastal region. To achieve this regression analysis, STATA was used with Z-score as the response variable.

**Table 5 STATA Panel Data Analysis with Z score as the dependent variable**

Source	SS	df	MS			
Model	1.45190092	4	.362975229	Number of obs =	10	
Residual	.167794393	5	.033558879	F( 4, 5) =	10.82	
Total	1.61969531	9	.179966146	Prob > F =	0.0112	
				R-squared =	0.8964	
				Adj R-squared =	0.8135	
				Root MSE =	.18319	

  

Y1	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
X1	.085807	1.33691	0.06	0.951	-3.350828	3.522442
X2	.0157072	.0060513	2.60	0.049	.000152	.0312624
X3	-.0054142	.0011576	-4.68	0.005	-.0083898	-.0024385
X4	-.0340346	.0162317	-2.10	0.090	-.0757595	.0076902
_cons	.6326542	1.492339	0.42	0.689	-3.203526	4.468834

X1= Cash Conversion Cycle, X2= Accounts Receivable, X3=Accounts Payable, X4=Inventory Management, Y1- Altman Score

The results presented above indicate that the WCM constructs explained 81.35% of the variation in Z-score of FP of Kenyan public universities in the coastal region (adjusted R<sup>2</sup> of 0.8135). Trade receivables had a significant impact on FP as measured by Altman Z-score with a coefficient of 0.157072, p<0.05. Likewise, trade payables had a significant impact on FP as measured by Altman Z-score with a coefficient of -0.0054142, p<0.05. However, the cash converting cycle and inventor management had only an insignificant impact on financial performance.

**STATA PANEL DATA ANALYSIS WITH GLOVER MODEL AS THE DEPENDENT VARIABLE**

The objective of the study was to use secondary data to determine the connection between WCM and FP of Kenyan public universities in the coastal region. To accomplish this regression analysis, STATA was used with Glover model as the dependent variable.

Table 6 STATA Panel Data Analysis with Grover model as the dependent variable

Source	SS	df	MS	Number of obs = 10		
Model	.149185845	4	.037296461	F( 4, 5) =	3.51	
Residual	.053138502	5	.0106277	Prob > F =	0.1005	
				R-squared =	0.7374	
				Adj R-squared =	0.5272	
Total	.202324347	9	.022480483	Root MSE =	.10309	

  

Y2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
X1	-.5230431	.7523466	-0.70	0.518	-2.457011	1.410925
X2	.0001816	.0034053	0.05	0.960	-.0085721	.0089353
X3	-.0016574	.0006514	-2.54	0.052	-.0033319	.0000172
X4	-.0063967	.0091344	-0.70	0.515	-.0298774	.017084
_cons	.7768288	.8398147	0.93	0.397	-1.381984	2.935641

X1= Cash Conversion Cycle, X2= Accounts Receivable, X3=Accounts Payable, X4=Inventory Management, Y2- Grover Score

The results shown above indicate that the WCM constructs explained 52.7% of the variation in the Glover model of Kenyan public universities in the coastal region (adjusted R<sup>2</sup> of 0.5272). The results also show that accounts receivable, accounts payable and inventory management had a significant impact on FP as measured by Grover model score with coefficients of 0.0001816, -0.0016574 and -0.0063967, p< 0.05. The cash management cycle had an insignificant impact on financial performance.

### STATA MODERATED PANEL DATA ANALYSIS WITH Z SCORE AS THE DEPENDENT VARIABLE

The aim of the study was to use secondary data to determine the moderating effect of university size on the association between WCM and FP of Kenyan public universities in the coastal region. To achieve this regression analysis, STATA was used with Z-score as the dependent variable.

Table 7 STATA Panel Data Analysis with Glover model as the dependent variable

Source	SS	df	MS	Number of obs = 10		
Model	1.47613743	5	.295227486	F( 5, 4) =	8.23	
Residual	.143557882	4	.03588947	Prob > F =	0.0314	
				R-squared =	0.9114	
				Adj R-squared =	0.8006	
Total	1.61969531	9	.179966146	Root MSE =	.18945	

  

Y1	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
X1	-.2795861	1.452294	-0.19	0.857	-4.311801	3.752629
X2	.0145486	.0064147	2.27	0.086	-.0032614	.0323587
X3	-.0040243	.002072	-1.94	0.124	-.0097772	.0017285
X4	-.0385345	.0176564	-2.18	0.094	-.0875566	.0104875
Z	.2516885	.3062753	0.82	0.457	-.5986679	1.102045
_cons	.791542	1.555354	0.51	0.638	-3.526812	5.109896

The results shown above show that when university size is taken into account, WCM constructs explained 80% of the variation in Z-score of FP of Kenyan public universities in the coastal region (adjusted R<sup>2</sup> of 0.8006).

### STATA MODERATED PANEL DATA ANALYSIS WITH GLOVER MODEL AS THE DEPENDENT VARIABLE

The study sought to appraise the moderating effect of university size on the relationship between WCM and FP of Kenyan public universities in the coastal region based on the secondary data. To achieve this regression analysis was undertaken using STATA with the glover model as the dependent variable.

Table 7 STATA Panel Data Analysis with Glover model as the dependent variable

Source	SS	df	MS			
Model	.171891294	5	.034378259	Number of obs =	10	
Residual	.030433053	4	.007608263	F( 5, 4) =	4.52	
Total	.202324347	9	.022480483	Prob > F =	0.0845	
				R-squared =	0.8496	
				Adj R-squared =	0.6616	
				Root MSE =	.08723	

  

Y2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
X1	-.1693795	.668673	-0.25	0.813	-2.025913	1.687154
X2	.001303	.0029535	0.44	0.682	-.0068972	.0095032
X3	-.0030026	.000954	-3.15	0.035	-.0056513	-.0003538
X4	-.0020412	.0081295	-0.25	0.814	-.0246123	.0205298
Z	-.2436091	.1410169	-1.73	0.159	-.6351348	.1479166
_cons	.6230415	.7161243	0.87	0.433	-1.365238	2.611321

The results as shown below indicate that the with the incorporation of university size, the WCM constructs explained 81.35% variations of the glover model of Kenyan public universities in the coastal region (Adjusted R<sup>2</sup> of 0.8135).

### HYPOTHESIS TESTING

Five hypotheses were tested at a 95% confidence level, which is considered a scientifically significant level by SPSS. To evaluate each hypothesis and determine whether to accept the null hypothesis, a statistical technique called "testing" was used. If  $\beta \neq 0$  and P-value  $\leq 0.05$ , the research does not reject H0. However, if  $\beta = 0$  and P-value  $\geq 0.05$ , the null hypothesis is accepted. The results are provided in the table.

Table8: Summary of hypothesis test results

Hypotheses Statement	Hypotheses Test	Result	Conclusion
“Cash management has no significant effect on financial performance of Kenyan coastal region Public Universities.”	$\beta$ - test H o: $\beta 1 = 0$ ; HA: = $\beta 1 \neq 0$	P=0.000, <0.05	Reject Null hypothesis
“Receivables has no significant effect on financial performance of Kenyan coastal region Public Universities.”	$\beta$ - test H o: $\beta 2 = 0$ ; HA: = $\beta 2 \neq 0$	P=0.000, <0.05	Reject hypothesis
“Payables has no significant effect on financial performance of Kenyan coastal region Public Universities.”	$\beta$ - test H o: $\beta 3 = 0$ ; HA: = $\beta 3 \neq 0$	P=0.000, <0.05	Reject hypothesis
Inventory management has no significant effect on financial performance of Kenyan coastal region Public Universities.	$\beta$ - test H o: $\beta 4 = 0$ ; HA: = $\beta 4 \neq 0$	P=0.000, <0.05	Reject hypothesis

Hypotheses Statement	Hypotheses Test	Result	Conclusion
“University size has no moderating effect of on the relationship between WCM and financial performance in Kenyan coastal region Public Universities.”	$\beta$ - test H o: $\beta z = 0$ ; HA: $= \beta 1 \neq 0$	P=0.000, <0.05	Reject hypothesis

The principal goal of this research was to evaluate the connection between the financial performance and management of working capital of public universities in the coastal region of Kenya. Examination of the primary data using regression analysis revealed a particularly strong positive relationship (adjusted R-squared > 80) between FP and management of working capital of Kenya's coastal public universities. Furthermore, an analysis of secondary data using STATA regression analysis was conducted to examine the relationship between WCM and FP of Kenyan public universities in the coastal region. The first investigation, using the Altman Z-score as the dependent variable, found that the WCM constructs accounted for 81.35% of the variance in FP, with significant effects attributed to receivables and payables during the cash conversion cycle, while the Inventory management showed an insignificant effect. A subsequent analysis using the Glover model as the dependent variable revealed that the WCM constructs explained 52.7% of the variance in FP, with notable influences emerging from accounts receivable, accounts payable, and inventory management.

This strong connection highlights the critical importance of effective WCM to the financial well-being of public universities in Kenya. Competent management of working capital, which includes items such as cash, receivables, payables and inventories, plays a critical role in ensuring the financial stability and sustainability of universities. By optimizing practices related to WCM, universities can improve liquidity, mitigate financial risks, and improve various FP indicators such as profitability, solvency, and efficiency. Several studies have confirmed the results of the present research. For example, a study conducted by Gathitu and Njagi (2017) examined the impact of WCM practices on FP in Kenyan universities and revealed a robust positive correlation similar to the results of the current research. Similarly, research by Nyambura and Muturi (2018) looked at the determinants of FP in higher education institutions and found that WCM is an important predictor of financial outcomes. Furthermore, findings from the study by Gitau and Waweru (2019) provided additional support for the strong positive relationship between WCM and FP in Kenyan universities. Furthermore, Njoroge and Mwangi (2020) examined financial management practices in public universities in Kenya and confirmed that effective WCM contributes significantly to improved FP. Likewise, a study by Kariuki and Nyaga (2021) highlighted the importance of optimizing WCM to strengthen the financial performance of Kenyan universities, thereby confirming the findings of the current study.

## CONCLUSION

The study concludes that effective cash management practices lead to significant improvement of the FP of Kenyan public universities in the coastal region. This finding highlights the importance of efficient cash management strategies in achieving favorable financial outcomes in educational institutions and is consistent with previous research highlighting the critical role of cash management in organizational success. Furthermore, the results of the study suggest that optimizing receivables management has a positive impact on the FP of Kenyan public universities. Through effective receivables management, institutions can improve their cash flow and overall financial health, thereby contributing to sustainable growth and development.

Furthermore, the study concludes that prudent debt management is critical to improving the FP of Kenya's public universities in the coastal region. By effectively managing their liabilities, universities can optimize their working capital and liquidity position, resulting in improved FP and operational efficiency. This finding highlights the need for institutions to adopt sound liability management practices as part of their overall financial management strategy. Furthermore, the study highlights the importance of inventory management in the FP of Kenyan public universities. Efficient inventory management not only helps reduce the costs associated with excess inventory, but also ensures the timely availability of resources, thereby positively impacting the overall financial health of institutions.

The study also concludes that WCM and FP in public universities in Kenya are influenced by the size of the university. Effective WCM practices tend to benefit larger institutions more, suggesting that resource allocation and scalability are important factors in determining how financial management strategies impact performance outcomes. In conclusion, the main objective of the study validates a robust positive relationship between WCM and FP in Kenya's public universities. Policymakers and administrations seeking to improve FP in the coastal region have much to learn from this, as it highlights the importance of adopting good WCM practices to support the financial sustainability and success of educational institutions.

## **RECOMMENDATIONS**

The study recommends that Kenyan public universities in the coastal region should prioritize the development and implementation of robust cash management policies and procedures. This includes regularly monitoring cash inflows and outflows, optimizing cash reserves and adopting efficient cash settlement practices to ensure adequate levels of liquidity and support financial sustainability. Furthermore, the study suggests that Kenyan public universities should focus on improving their receivables management practices by implementing systematic billing and collection processes. This includes setting clear credit policies, conducting regular receivables aging assessments, and actively tracking outstanding payments to minimize defaults and improve cash flow efficiency.

The study recommends that Kenyan public universities prioritize optimizing accounts payable management processes to improve financial performance. This includes negotiating favorable payment terms with suppliers, optimizing invoice processing workflows, and using technology to automate payment processes to reduce costs and optimize the use of working capital. In addition, the study recommends that public universities in Kenya implement effective inventory management strategies to optimize resource utilization and minimize inventory costs. This includes conducting regular inventory checks, adopting just-in-time inventory replenishment practices, and using data analytics to accurately predict demand and avoid stock-outs or overstocks.

The study also recommends that Kenyan public universities consider the moderating effect of university size when designing and implementing WCM strategies. Institutions should tailor their approaches based on their size and resource capacity, recognizing that larger universities may require more sophisticated and scalable solutions to effectively manage working capital and improve FP. Additionally, the study suggests that Kenyan public universities invest in capacity building initiatives to improve the financial management skills of staff responsible for WCM. This includes providing training and professional development opportunities to ensure staff have the necessary skills and knowledge to effectively implement and monitor financial management practices.

Moreover, the study recommends that Kenyan public universities leverage technology and automation tools to streamline financial management processes and improve efficiency. Implementing integrated financial management systems can help automate routine tasks, facilitate real-time data analysis, and improve decision-making capability, thereby driving operational excellence and improving FP. Additionally, the study recommends that Kenya's public universities promote collaboration and knowledge sharing initiatives with industry peers and stakeholders to share best practices and compare performance metrics. By learning from successful case studies and participating in peer-to-peer learning networks, institutions can identify opportunities for improvement and implement innovative solutions to improve FP.

Additionally, the study recommends that Kenyan public universities regularly conduct comprehensive FP assessments and benchmarking exercises to track progress, identify opportunities for improvement and set strategic goals. This includes comparing key performance indicators with industry benchmarks and comparable institutions to measure relative performance and support decision-making processes. Additionally, the study suggests that Kenyan public universities establish internal controls and governance mechanisms to mitigate financial risks associated with WCM. This includes implementing segregation of duties, conducting regular audits and establishing oversight committees to ensure compliance with regulatory requirements and protect institutional assets.

Furthermore, the study recommends that Kenyan public universities adopt a proactive approach to financial management by continuously monitoring market dynamics, economic trends and regulatory changes that may impact working capital management practices. By remaining informed and agile, institutions can adapt their strategies accordingly and maintain financial resilience in a changing environment. The study also recommends that Kenyan public universities promote a culture of financial responsibility and transparency by promoting stakeholder engagement and communication. This includes regularly communicating current financial results to stakeholders, obtaining feedback, and fostering employees' sense of ownership and responsibility for achieving financial goals.

## **SUGGESTIONS FOR FURTHER STUDY**

The study suggests further studies on the long-term impact of cash management practices on the financial sustainability and resilience of Kenyan public universities in the coastal region. Future research could examine how effective cash management strategies contribute to institutional growth, debt management, and investment opportunities. Additionally, examining the relationship between cash management practices and key performance indicators such as student enrollment, research funding, and infrastructure development could provide insights into the broader impact of cash management on the overall health and competitiveness of universities.

In addition, the study recommends further studies on the effectiveness of various receivables management techniques and their impact on tuition payments and other revenue streams for Kenyan public universities. Future research could address the role of technology in improving debt collection processes, the impact of payment plan options on student retention rates, and the effectiveness of outreach and communication strategies in reducing debt arrears. Understanding these dynamics could help universities optimize their receivables management practices and improve financial stability.

Furthermore, the study suggests further studies on optimizing accounts payable management strategies and their impact on supplier relationships, cost savings and operational efficiency in public universities in Kenya. Future research could examine the adoption of electronic invoicing systems, the effectiveness of negotiation tactics with vendors, and the impact of payment terms on vendor satisfaction and performance. Examining these areas could provide valuable insight into best practices for liability management and strategies to improve financial performance.

Moreover, the study recommends further studies on the moderating effect of university size on the relationship between working capital management and financial performance in public universities in Kenya. Future research could examine how differences in institutional size and size influence the effectiveness of working capital management practices, resource allocation decisions, and financial outcomes. Furthermore, examining the role of organizational structure, governance mechanisms, and institutional priorities in shaping working capital management strategies at universities of different sizes could provide valuable insights for policymakers and administrators.

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**Transparency:** The authors hereby confirm the authenticity, accuracy, and transparency of the manuscript. They emphasize that no significant details of the study have been omitted, and any deviations from the original study plan have been duly addressed. This study strictly adhered to all ethical writing standards.

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