

The Nexus between Working Capital Management Practices and Sustainability of Water and Sanitation Companies (WASCOS) in Kenya: A *Post Positivism Approach*

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Abstract: *Sustainability of Water and Sanitation (WATSAN) services is an artful trade-off between adequacy and quality of supply. Achievement of the two attributes remain a problem globally. Water and sanitation is classified as sustainable development goal number six in the UN seventeen sustainable development goals. The sector is regarded as an enabler to the achievement of all the other SDGs. WATSAN sustainability encompasses improved access, acceptable water quality against growing demand. The study examined the effect of working capital management practices on sustainability of WASCOS in Kenya. The study was guided by Gitma's cash conversion cycle theory. The Study adopted a post positivism research philosophy and mixed research design. A sample of 46 companies was selected from the 91 licensed WASCOS in Kenya. A five-point likert scaled questionnaire was used to collect primary data. Secondary data was collected using secondary data collection sheet from the annual impact reports by water and sanitation regulatory board (WAREB). Cronbach's alpha coefficient was used to assess for reliability while Kaiser-Meyer-Olkin test and Bartlett's Chi-Square test of Sphericity was used to assess for validity of the data collection instrument. Diagnostic tests of Gaussian distribution, outliers, autocorrelation, multicollinearity and linearity were carried out using Q-Q plot, box plot, Durbin-Watson d statistic, Tolerance & Variance Inflation Factor statistics and Pearson's correlation coefficient respectively. A multivariate linear model generated result with $R^2=0.930$. The results imply working capital management practices explained approximately 93% of WASCOS sustainability. ANOVA results show F-statistics of 135.979 with a p-value of 0.000 indicating existence of a statistically significant influence of financing practices on sustainability of WASCOS. Beta coefficients results for cashflow management practices show $\beta=13.396$ followed by $\beta=9.043$ for payables management practices, $\beta=6.841$ for receivables management practices and lastly, $\beta=3.224$ in the case of inventory management practices. The study recommends the consistent implementation of sound practices across the working capital pillars as all were statistically significant in driving sustainability of the WASCOS's.*

Keywords: Sustainability, Water and Sanitation, Working Capital Management, WASCOS

1. Introduction

1.1 Background of the Study

Sustainable development is defined as economic growth that meets the needs of the present generation without compromising the ability of future generations to meet their own needs (WCED, 1987). Firm sustainability is a rigorous performance measure that has gained more acceptance and attention in the recent past (Rezaee & Homayoun, 2014). Water has been noted as an enabler to the achievement of the sustainable development goals. Africa has the least water distribution at about 9%, America has 45% which is the highest share freshwater resources at the global level followed by Asia (28%) and Europe (15.5%) in that order (Mugagga, 2016). This distribution of fresh water which is not balanced has significantly accelerated the water problem at the global

village (UNGA, 2015). Majority of African countries are classified as least developed with high population growth resulting to a strained demand for water resources (Mugagga & Nabaasa, 2016). The latest performance evaluation of the water and sanitation companies in Kenya shows low access and high non-revenue water losses standing at Kshs.11.2b (Wasreb 2023).

1.2 Problem Statement

Improving sustainability of water and sanitation services is one of the country's commitments towards contributing in achievement of SG6. In Kenya, access to potable drinking water has been ranked poorly at approximately barely half (53%) within the population. On the other hand, more than three quarters (77%) of the population have no access to improved sanitation. These two statistics point that WATSAN "access" is a deep-rooted national problem. This scenario happens at a time when

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the National Government allocations/spending on water development suffered a significantly decline to approximately Kshs.45b in 2022 from over Kes 60 billion in the past. The regulator estimates the financing need to facilitate the achievement of sustainability of up to 5 times the present level allocation(s). Water and Sanitation companies in Kenya continue recording high water losses annually estimated at Kshs.11.2b in 2022. Threatening sustainability of the sector. The players in the sector are of different corporate sizes with a mix of varying/differing working capital management practices. Economic theory points that financial management is a key tool for safeguarding entity performance and sustainability. This study explores whether working capital management practices among the firms in the sector do have a role in driving sustainability of WASCOs in Kenya.

1.3. Study Objective

The objective of the study was to examine the nexus between working capital management practices and sustainability of water and sanitation companies (WASCO's) in Kenya.

2. Literature Review

2.1 Cash Conversion Cycle Theory

The Cash Conversion Cycle theory introduced by Gitman (2007), suggests that, the amount of money needed in day to day operations is a factor of the several elements including; payables on one hand and inventory, receivables and cash on the other hand. The theory is founded on the operating cycle of a business. The CCC considers the average time funds are held in inventory, accounts receivables and subtracts the number of days funds are withheld in accounts payables. Additionally, the theory focuses on accelerated cash timelines for all cash inflows through, application of additional efforts and delay in settlement of short term liabilities (Gupta & Huefner, 2012). The theory considers any financing gaps needing bridge liquidity with a particular focus on the timing for excess available from operations or additional funds are required for operations.

2.2 Empirical Literature

Working capital management involves business activities and operations which impact current assets including cashflows, debtors, payables and inventory (Sensini, 2020). Working capital management practices influence on firm performance has been assessed severally by; Muthama et al (2016), Fwabwa (2017), Dhole et al (2019), Aktas et al (2015) and Javid (2014). These studies used different theoretical models to explain the impact of working capital management and firm performance. The commonly used theories include; aggressive, conservative & moderate collection approaches (Aktas et al, 2015; Ukaegbu, 2014) and Cash conversion cycle theory (Asaduzzaman et al, 2014, Le et al, 2018)

Empirical evidences show that working capital management practices has a positive influence on firm performance. Onchoke and Wanyoike (2016) found inventory control practices positively influences firm performance. Similarly Mwangi and Nyanyura (2015) assessed the influence of inventory management practices on firm performance. They found production maintenance, cost control and continuous supply as key elements that affects firm performance. Wangari and Kagiri (2015) found inventory investment, inventory shrinkage and inventory turnover having a significant influence on firm competitiveness. Mwirigi et al (2018) found that accounts payable had a positive but insignificant effect on performance. Kwatiah et al (2020) found working capital management practices of accounts payable, accounts receivable and inventory management have a positive and statistically significant influence on firm profitability. Prempeh and Amankona (2018) found a positive influence on firms' profitability. Le et al (2018) concluded that working capital management has a positive influence on firm's financial performance.

Working capital management has been found to negatively influence firm performance. Mwirigi et al (2018) found accounts receivable negatively influences firm performance. Similarly, inventory practices were found to have a negative effect on performance. Sensini (2020) found a negative association between working capital management and firm profitability. Wang et al (2020) concluded that working capital management negatively influences firm performance. There are empirical findings that working capital management influenced firm performance in a positive and negative way simultaneous depending on firm size. Banos-Caballero et al (2016) reported an inverted U-shaped relationship with profitability. The influence of working capital management practices on firm performance and sustainability continues generating varying results depending on the approach. Based on the empirical literature reviewed, the following hypothesis was formulated:

H0: Working capital management practices do not have a statistically significant effect on sustainability of water and sanitation companies in Kenya

2.3 Conceptual Framework

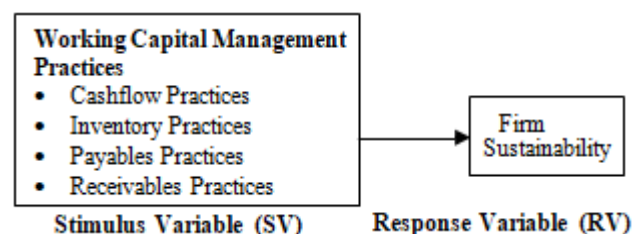


Figure 1: Conceptual Framework

2.4 Research Gaps

A great number of the past studies focused on small towns or institutions in Nairobi (Fwamba, 2019 & Washika, 2021) the current study focuses on Water and Sanitation companies in Kenya distributed in the whole country thus presenting a contextual gap. Further, water

and sanitation being public goods offered majorly through private companies wholly owned by public entities provides for a complex mix regarding; price setting, area of coverage, regulations and legal framework. The decisions and practices from one sector to the next as regards the financial management decisions would differ. In addition, the regulators and socio-economic products produced differ too. Majority of the studies in the literature reviewed (Musah, 2018; Rugui, 2018; Muneer, 2017 and Obazee, 2019) on financial management practices focused on SMEs and majored on selected financial management practices with CSM and WCM taking a dominant place. These studies provide a contextual gap in that they have been undertaken on financial management practices majority of which covered the Small and Micro enterprises and listed companies and manufacturing companies while the present study focuses on the WATSAN industry in Kenya.

3. Research Methodology

3.1 Philosophy, Design and Instrumentation

The study adopted a positivist philosophy that is posit that reality is observable, stable and described from an objective view point (Saunders et al, 2019). The study adopted a descriptive research design allowing for the assessment of respondents views regarding a phenomenon (Bell et al, 2022). A sample of 46 out of the population of 91 WASCOs in Kenya was purposely selected. A structured questionnaire was applied in primary data collection while a secondary data was collected from the regulators annual reports.

3.2 Stability of Instrumentation

The Cronbach's Alpha coefficient was applied in assessing the instrument for reliability. The results show a coefficient of 0.934 for the stimulant variable while the response variable had a coefficient of 0.892. The reliability results were adequate as they were above the

minimum threshold of 0.7 (Saunders et al, 2019). Validity was assessed using the Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of Sphericity (Tobias & Carlson, 1969). A KMO coefficient of 0.907 and an associated p-value of 0.000 at 136 degrees of freedom was achieved. The Kaiser-Meyer Olkin (KMO) statistics for all the study was greater than the minimum KMO coefficient threshold of 0.7 (Saunders et al, 2019).

3.3 Data Analysis and Results Presentation

Data analysis was carried out using SPSS and involved diagnostic testing and inferential analysis. A multivariate regression model was used to test the hypothesis. The model used to assess the relationship was in the form: $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon$. Where $Y =$ Sustainability, $\beta =$ Regression Coefficients, $X =$ Working Capital Management Practices and $\epsilon =$ Stochastic error term

4. Findings and Discussions

4.1 Response Rate

A response rate of 83.7% was arrived at following the distribution of one hundred eighty four questionnaires and receipt of one hundred and fifty four responses. The response rate was considered adequate (Kombo & Tromp, 2016). The result implies that the findings could be generalized on the population

4.2 Diagnostic Tests

4.2.1 Tests Results for Normality and Outliers

Normality and outlier tests were carried out using the graphical method by generating the Q-Q plot and the box plot respectively. The Q-Q plot show the data for the response variable was normally distributed. The box plot show no signs of outliers in the dataset. These results imply that the dataset for sustainability is suitable for regression analysis (Saunders et al, 2019).

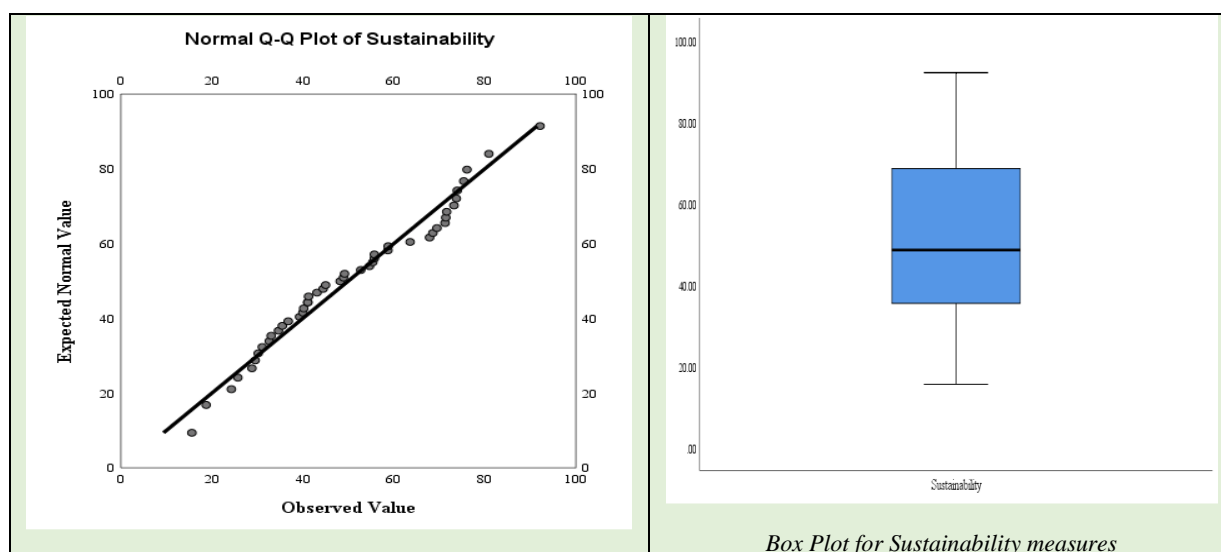


Figure 2: Q-Q Plot and Box Plot for Response Variable

4.2.2 Test Results for Multicollinearity

Multicollinearity was examined using Tolerance and Variance Inflation Factor (VIF).

Table 1: Results for Multicollinearity

Model	Collinearity Statistics	
	Tolerance	VIF
Cashflow Practices	.982	1.018
Inventory Practices	.981	1.019
Payables Practices	.979	1.021
Receivables Practices	.977	1.024

The results show tolerance of 0.982 and a VIF of 1.018 for cashflow management practices, 0.981 and 1.019 for inventory management practices. The results for payables management practices show a tolerance of 0.979 and VIF of 1.021 while receivables management practices show tolerance of 0.977 and VIF of 1.024. These results imply the dataset was not multicollinear as the tolerance was above 0.1 and the VIF coefficients were below 10 (Saunders et al, 2019).

4.2.3 Test Results for Autocorrelation

The Durbin Watson coefficient (d-statistic) was used to assess for autocorrelation. This test generated a *d-statistic* of 1.780. This was within the acceptable range of one point five and two point five for an absence of autocorrelation data set (Hair et al, 2014).

4.2.4 Linearity Tests Results for the Study Variables

The Pearson's correlation coefficient, *r* was used to assess linearity (Gogtay & Thatte, 2017). A coefficient, *r*=0.885 was generated a p-value of 0.000. The results imply the linearity was confirmed and the data set was appropriate for regression analysis.

4.4 Regression Analysis for Working Capital Management and Sustainability

A multiple linear regression analysis generated the results presented in Table 2

Table 2: Multivariate Regression Output for Working Capital Management

Working Capital Management Model	R	R ²	Sums of Squares	F (4,41)	Beta (β)	t	Sig
Model Fitness	0.964	0.930					
ANOVA							
Regression			14411.735	135.979			0.000
Residual			1086.343				
Total			15498.078				
Coefficients							
Constant					-63.870	-11.598	0.000
Cashflow Practices					13.396	16.152	0.000
Inventory Practices					3.224	3.731	0.001
Payables Practices					9.043	11.658	0.000
Receivables Practices					6.841	7.103	0.000

The results show $R^2=0.930$ implies that working capital management practices accounts for approximately 93% of changes in sustainability. ANOVA results show F statistic of 135.979 and p-value of 0.000 which was significant (Hair et al, 2014). Based on these results, the null hypothesis is rejected. The alternative hypothesis was accepted. The results show cashflow practices $\beta=13.396$ and a p-value of 0.000. The result was significant as the p value of 0.000 was lower than the minimum threshold of 0.05. The finding imply that cashflow practices positively and significantly influence sustainability of WASCOS in Kenya. These results are similar to Mazzarol et al (2017). The results however differs with Wang et al (2020) that cash management negatively influences firm performance.

Results for inventory practices show $\beta=3.224$ with a p-value of 0.001. The results are significant and implies that inventory practices positively influence the sustainability of WASCOS in Kenya. The finding concurs with Onchoke & Wanyoike (2016), Mwangi & Nyambura (2015), Wangari & Kagiri (2015) and Kitheka & Ondieki (2014). The results for payables practices show $\beta= 9.043$ with a p value of 0.000. The results are statistically significant and implies that payables practices positive influence the sustainability of WASCOS in Kenya. These findings are similar to Mwirigi et al (2018) and Prempeh & Amankona (2018). Results further show $\beta =6.841$ and

a p-value of 0.000 for receivables practices. The results are significant and imply that receivables practices positively influence the sustainability of WASCOS in Kenya. These results are similar to Mwirigi et al (2018), Prempeh & Amankona (2018) and Kwatiah (2020). The overall results show that working capital management positively influences the sustainability of WASCOS in Kenya. This finding is supported by: Alvarez, 2020; Aktas et al, 2015; Mazzarol et al, 2015 & Dhole et al, 2019. The findings are supported by the cash conversion theory on accelerating cash timelines for all cash inflows through, application of additional efforts and delay in settlement of payables through engagement of suppliers (Gupta & Huefner, 2012). The model was fitted as: $Y = 13.396X_1 + 3.224X_2 + 9.043X_3 + 6.841X_4 - 63.870$, Where: $Y =$ WASCOS Sustainability, $X_1 =$ Cashflow Practices, $X_2 =$ Inventory Practices, $X_3 =$ Payables Practices and $X_4 =$ Receivables Practices

5. Conclusions and Recommendations

The study found that jointly and singly, working capital management pillar- practices had a statistically significant influence on sustainability of water and sanitation companies in Kenya. The practices with the highest influence were; cashflow management practices, payables management practices, receivables management and inventory practices in that order. The study recommends

the consistent implementation of sound practices across the working capital pillars as all were statistically significant in driving sustainability of the WASCO's.

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