Contributions of Financial Performance Indices on Service Delivery by Water Utilities in Kenya

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## Abstract

Water Utilities in Kenya are mandated and financed to be the sole retailers of clean and safe drinking water and sewer services to Kenyan living in urban and rural areas through the purchase of water in bulk from Water Service Boards. This study therefore investigated the contributions of financial performance on service delivery by the Water utilities in Kenya. The study specifically sought to establish the contribution of capital adequacy, financial leverage, liquidity and firm size on billed and non-billed water in Kenya. The study employed causal research design with secondary data obtained from the audited financial reports from the 47 water utilities in Kenya. The study collected secondary data on the capital adequacy, financial leverage, liquidity and firm size. The data was analyzed using STATA for windows computer software. The study established a positive coefficient on the relationship between capital adequacy and revenue water (r=0.481, p=0.000), this finding was an empirical prove that adequate capital was the contribution of the positive changes in revenue water in Kenya. Secondly, the study established a negative coefficient on the relationship between capital adequacy and revenue water (r=-0.275, p=0.038) indicating that financial leverage reduced revenue water service delivery in the water utilities in Kenya. Third, the study established a positive coefficient on the relationship between liquidity and revenue water (r=0.602, p=0.000) indicating that increasing liquidity by a unit lead to improved service delivery of revenue water for the water consumers in Kenya. Last, the study established an insignificant coefficient on the relationship between firm size and revenue water (r=0.083, p=0.217) indicating that increasing the value of total asset by a unit did not contribute to service delivery of revenue water for the water consumers in Kenya. The study therefore concluded that financial performance by water utilities in Kenya contributes to the level of service delivery by the water utilities in Kenya.

**Key Words:** *Service Delivery, Financial Performance, Financial Leverage, Capital Adequacy, Liquidity Performance*

## 1.0 Introduction

Improved access to water supply and appropriate sanitation is a central pillar of the millennium development goals which will result in the reduction of poverty and improved living standards in the world. The provision of clean, accessible and affordable water is one of the millennium development goals targeted at the over 1.2 billion people living in the world who lack access to clean and safe drinking water (Estache & Kouassi, 2002). However, fresh water resources are now growing scarce day by day which has resulted in conflicts among states and territories and also communities (Falkenmark and Rockström, 2004). Despite the concerted efforts to improve access to clean, safe and affordable water to both the urban poor and rural poor, accessibility of clean and safe water continues to be a major challenge in developing countries (UNDP, 2007). In Kenya, millions of people currently lack access to water resulting in them being forced to continue drinking unsafe water or use minimal quantities of water as distance, queuing time, and cost make water inaccessible (Uwazi, 2010).

According to WUP (2003), in the whole world, the lowest supply to water and sanitation coverage is found in Africa. Currently, more than 1 in 3 Africans living in urban areas lack access to adequate services and facilities at present (WUP, 2003). The findings by Water and Sanitation Program (2005) indicate that many people in low income areas rely on more than one source to acquire the water they need for survival. In the findings, majority of households obtain water from intermediaries who include landlords, water kiosks or vendors. According to the UN-Water report (2015), rapid population growth and incapacity or unwillingness of local and national governments to provide sufficient water and sanitation services are the major causes of increase in the number of people without access to clean water and sanitation in urban areas in developing world. The problem of water crisis in the world is associated with poor governance thus the solution can only be found in improving water governance (Birongo and Quyenle, 2005).

Water losses are a key cost element in most water utilities in developing countries and this has made the control of water losses among water service providers a key strategy. Apart from water loses the bill collection has been a major issue in developing country with leaks in bill collection still been experiences. This has been caused by poor revenue collection systems and corruption among other factors. Poor bill collection by many poor water service providers has affected their cash streams resulting to most of the water service utilities not been able to fulfill their mandates effectively (Atunga, 2015).

These are commercial entities formed under the jurisdiction of water service boards and mandated to provide water services. In accordance with the water act of 2002 the WSPs mandate include the provision of water and sanitation services, ensuring good customer relation and sensitization, adequate maintenance of assets and reaching a performance level set by regulation .The Companies took over the provision of water and sewerage services from their respective municipal councils. By 2009, 118 such WSPs had been licensed and in operation in the country (WASPA, 2014). The WSP are expected to meet stipulated Minimum Level Service (MLS) benchmarks that they sign in agreement with WSB each WSP was expected to meet. The MLS are interim yearly benchmarks indicators in water coverage, revenue collection efficiency, UFW and hours of water supply. They represent incremental steps considered critical to achieving the MDG by 2015.

Water being a basic human right, there is very little literature on the contribution of financial performance on service delivery by the Water utilities in Kenya, more especially the contributions of capital adequacy, financial leverage, liquidity and firm size on service delivery by the Water utilities in Kenya. This is the literature gap the current study filled by testing the following hypotheses; **H01**: Capital adequacy does not contribute to service delivery by the Water utilities in Kenya; **H02**: Financial leverage does not contribute to service delivery by the Water utilities in Kenya; **H03**: Liquidity does not contribute to service delivery by the Water utilities in Kenya; **H04**: firm size does not contribute to service delivery by the Water utilities in Kenya.

**2.0 Literature Review**

**2.1 Theoretical Review**

**2.1.1 Efficient Structure Theory**

The efficiency structure hypothesis was developed by Demesetz (1973). It is the proposition that more efficient companies will better compete, develop and grow in scale, thus resulting in an increase in the degree of market concentration. The hypothesis also assumes that such companies will achieve high profitability while maintaining high market shares. Hence, under this hypothesis, it is expected that the greater the degree of market concentration, the more efficient the market. This theory was the basis of analyzing the contribution of capital adequacy on service delivery by water utilities in Kenya.

**2.1.2 Trade Off Theory**

The tradeoff theory was developed by Myers and Majluf in 1984 and considered the tax advantage and costs of debt. The trade-off theory of capital leverage states that value maximizing firms obtain an optimal capital structure by balancing the personal tax, bankruptcy, or agency costs against tax shield (Myers 1984). In this theory value maximizing firms obtain optimal capital structure by balancing costs of debt and the benefits of debt such as tax shields. In this study financial leverage is linked the tradeoff theory in the sense that large firms are more diversified taking up debt that will increase premium growth. If firms optimally finance only periodically because of transaction costs, then the debt ratios of most firms will deviate from the optimum most of the time. In the model, the firm’s leverage responds less to short-run equity fluctuations and more to long run value changes. This theory was the basis of analyzing the contribution of financial leverage on service delivery by water utilities in Kenya.

**2.1.3 Neoclassical Theory of Investment**

This theory originates from Jorgenson (1963). The theory draws its fundamentals from the maximization of utility and wealth of a firm over time (Warström & Niemelä, 2015). In the neoclassical theory, investment is seen as a distributed lag function of variations in the required capital. The required or desired capital here acts as a function to the output level, user capital cost and output price (Twine, Kiiza, & Bashaasha, 2015). The theory presupposes that investment is a function of cost of capital and the firms output. Additionally, the theory contends that the capital and labour ratios adapt to the relative changes in prices (Virlics, 2013). For this study, the neoclassical theory will be employed to explore whether asset quality as a measure of firm size measured in terms of ROI, meant to contribute to service delivery by water utilities in Kenya.

**2.1.4 Liquid Asset Theory**

Liquid Asset Theory was initially developed by Beaver (1966), the theory also looks at a firm as a liquid asset reservoir that is either supplied or drained by inflow and outflow respectively and it acts as a buffer in flows variations. Also, the firm solvency is explained in the likelihood that there will be an exhaustion of the reservoir which could bring failure due to incapability of the company to settle matured obligations. It is the assumption of the theory that a firm goes bankrupt when debt obligations exceed the profits in the current year or when a summation of both the expected equity value and current year profit becomes less than zero or negative. The theory was used to analyze the contribution of liquidity on service delivery by water utilities in Kenya.

**2.2 Empirical Review**

**2.2.1 Capital adequacy and Service Delivery**

Owino (2014) studied on the effects of working capital management on the manufacturing companies profitability in Kenya and he used descriptive statistical approach to describe the effect of management of working capital. He used secondary data from financial reports for five years to observe the working capital components behavior of 12 companies. The collected data was analyzed using central tendency measures and was also subjected to computerized analysis using Microsoft excel spread-sheet and SPSS. This study found out that, no significant relationship existed between profitability and working capital components apart from the size of the firm. The study confirmed a significant positive effect of the size of the firm on profitability. Owino (2014) did not analyze the contribution of capital adequacy on service delivery of water Utilities in Kenya which was the research gap the current study analyzed and results presented in section4.0.

**2.2.2 Financial Leverage and Service Delivery**

Javed et al (2015) investigated on the impact of leverage on operating effectiveness among the firms in Asian continent using 150 manufacturing firms, which ran for a period of 10 years from 2004-2014.The study revealed an existence of inverse correlation linking leverage to firm effectiveness**.** The study concluded that as the firm increases its borrowing, its efficiency decreases and vice versa. The study however focused on operating effectiveness and leverage and not leverage and financial performance. Javed *et al.,* (2015) did not analyze the contribution of financial leverage on service delivery of water Utilities in Kenya which was the research gap the current study analyzed and results presented in section4.0.

Gweyi and Karanja (2014) investigated the impact of leverage on performance of Kenyan registered deposit-taking SACCOs using a sample of 40 Savings and Credit Co-operative Societies. The study used secondary data for period of 2 years from the year 2010 to 2012. The findings of the study established that a positive correlation exists between the debt equity ratio with return on equity and after tax profits. Banafa, Muturi and Ngugi (2015) examined impacts of leverage on financial performance of listed Kenyan non-financial firms using causal research design and 42 listed non - financial firms at NSE over a period of five years from the year 2009-2013. The study used the regression model to analyze the collected data. The study revealed that leverage had a negative and significant impact on corporate financial performance. Muthuva (2009) established that bank profitability is positively related to the core capital ratio and the tier 1 risk-based capital ratio. This implies that an increase in capital may raise expected earnings by reducing the expected costs of financial distress, including bankruptcy. The study also establishes that there exists negative relationship between the equity capital ratio and profitability. The study also finds out that Kenyan banks are not competitive enough globally in terms of their efficiency as measured by the Cost-Income Ratio (CIR). The study reveals that the CIR is inversely related to both bank profitability measures. The study also reveals that the CIRs of Kenyan banks are higher than those of developed countries. This means that Kenyan banks should strive to keep their CIR to a minimum level, if possible below the 50% threshold for them to be more efficient so as to be globally competitive. These studies did not analyze the contribution of financial leverage on service delivery of water Utilities in Kenya which was the research gap the current study analyzed and results presented in section4.0.

**2.2.3 Liquidity and Service Delivery**

Muriithi and Waweru (2017) examined the effect of liquidity risk on the financial performance of commercial banks in Kenya. The results indicated that liquidity coverage ratio had no significant influence on financial performance while net stable funding ratio had a negative effect on financial performance. Karlsson and Svensson (2016) examined the relationship between liquidity and the capital structure of IT and real estate firms listed on the Nasqad OMX in Sweden. Kamau and Njeru (2016) in their study on effect of liquidity risk on financial performance of Insurance Companies Listed at the Nairobi Securities Exchange established there is a negative relationship between liquidity risk and financial performance for the insurance companies measured by the ROE. Eljelly (2014) found that there was a significant negative relationship between a firm’s profitability and its liquidity level.

Kimani (2018) in his study on Effect of Liquidity Management Strategies on Sustainability of Table Banking Groups in Uasin Gishu County, Kenya found out that liquidity management strategies influences sustainability of table banking groups. Table banking groups should manage liquidity levels to enhance sustainability. The study inferred that it was critical for table banking groups to have adequate liquidity levels in order to ensure that the groups meet short term obligations and more so to enhance sustainability. These studies did not analyze the contribution of liquidity on service delivery of water Utilities in Kenya which was the research gap the current study analyzed and results presented in section4.0.

**2.2.4 Firm Size and Service Delivery**

Ching and Gerab (2012) studied the indicators that most affect profitability of Brazilian cyclical consumer goods industry. Sixteen companies with current asset greater than 50% of total asset, for the period 2005-2009, were selected for the study. Regression Model was used in the study. The concluded in their study that firm size can be an important determinant for firm performance and having larger size affects positively financial performance. Brown, Carson and Hoyt (2011), identified important economic and market factors and insurer specific characteristics related to the life insurer performance. In the study financial performance was positively related to the size and liquidity band portfolio returns whereas negatively related to anticipate inflation. Large insurance firms normally have greater capacity for dealing with adverse market fluctuations than small insurance firms. Ching and Gerab (2012) did not analyze the contribution of firm size on service delivery of water Utilities in Kenya which was the research gap the current study analyzed and results presented in section4.0.

**2.2 Conceptual Framework**

Conceptual framework is a hypothesized model identifying the concepts or variables used in a study and their relationships. It is a scheme of concepts (variables), which the researcher used to operationalize in order to achieve the study objectives. The purpose of the conceptual framework is to help the reader to see the proposed relationships.

**Independent Variables**

**Capital Adequacy**

* Core capital
* Total Capital

**Dependent Variable**

**Service Delivery**

* Billed Water
* Non-Billed Water

**Financial Leverage**

* Total Liability
* Total Asset

**Liquidity**

* Current Asset
* Current Liability

**Firm Size**

* Total Asset

Figure 2.1: Conceptual Framework

The independent variables of the study included; capital adequacy, financial leverage, liquidity and firm size. The dependent variable is service delivery measured in terms of billed and non-billed water.

## 3.0 Research Design and Statistical Techniques

The study employed causal research design with collected secondary data which was obtain from the 2018 audited financial reports from Auditor General Office, taken purposively from 47 water utilities in Kenya. The study target population was the 47 water utilities spread across the Counties in Kenya. The study purposively took one water utility from each county to add to the required sample size of 47 and also representing the phase of Kenya. The purposively selected water utilities included; the study collected secondary data dealing with the corporation debts, equity, retained earnings and financial performance of the corporations. The data analysis was based on panel regression using STATA for windows computer software. The multiple regression model used was as follows:

Y= β0+ β1X1+ β2X2+ β3X3+ β4X4 +ε

**Y**= Service delivery

**X1**= Capital Adequacy

**X2**= Financial Leverage

**X3**= Liquidity

**X4**= Firm size

βi = Coefficients of regression for the independent variables Xi (for i = 1,2,3,4)

e. = error term

**4.0 Findings and Discussions**

Table 4.2: Effect of Capital Structure on Financial Performance

|  |  |  |  |
| --- | --- | --- | --- |
| regression | | Number of obs = | 47 |
| R-sq: within = 0.0035 | | F(5, 47) = | 104.76 |
| between = 0.2528 | | Prob > chi2 = | 0.0008 |
| overall = 0.1076 | |  |  |
|  | | Wald chi2(4) = | 19.01 |
| corr(u\_i, X) = 0 (assumed) | |  |  |
| distr Coef. Std. Err. | | z P>z [95% Conf. | Interval] |
| Cap\_Adeq 0.481 0.228473 | | 3.60 0.000 6.945808 | 23.52112 |
| Leverage -0.275 0.855287 | | 1.28 0.038 -3.282454 | 15.74992 |
| Liquidity 0.602 0.134888 | | -3.18 0.000 -36.68125 | -8.713008 |
| Firm\_size 0.083 0.0259253 | | 0.86 0.217 -.0286332 | 0.072992 |
| \_cons 0.7085 0.1255043 | | 5.65 0.000 .4625539 | 0.9545216 |
| sigma\_u .58027673 | | |  |
| sigma\_e .92493462 | | |  |
| rho .28243078 (fraction | of variance due to u\_i) | |  |

The regression model in Table 4.1 shows the results of the contribution of capital adequacy, financial leverage, liquidity and firm size on performance of water utilities in Kenya, measured in terms of the amount of revenue water (billed) consumed by the customers of the respective water utilities. How the water utilities manager their financial performance is a predictor of service delivery of such utilities. The measure of non revenue water is an indicator of services not delivered, in the knowledge scope in finance, it may means that there was no adequate capital to increase billing, or failure to leverage financial resources in order to increase billing, or lack of liquid capital to meet obligations or lack of assets to generate the increase of billing.

The R2 was 0.2528 indicating that financial performance accounts for 25.3% of the total variation in service delivery by water utilities in Kenya while the other 74.7% was from factors outside the scope of the study. To confirm the significance of the contribution of financial performance on service delivery by water utilities in Kenya, analysis of variance established F statistics of 104.76, p=0.0008 indicating that overall, financial performance contributed to service delivery by water utilities in Kenya. It can, therefore, be statistically proved that the independent variables (indicators of financial performance) can contribute to service delivery of water utilities in Kenya, measured by revenue water (billed) which was delivered to the customers.

Based on the coefficients and significance level of the p-value, the study established, first, significant relationship between capital adequacy and service delivery of the water utilities in Kenya with r =0.481, p=0.000<0.05. This finding implies that an increase of capital by 1 unit increases service delivery by 0.481 multiple units. The hypothesis **H01**: Capital adequacy does not contribute to service delivery by the Water utilities in Kenya was therefore rejected. This was based on the statistical evidence that increasing capital adequacy of the water utilities in Kenya operations increased service delivery by 0.481 units.

Second, the study established insignificant relationship (r=-0.275, p=0.038<0.05) between financial leverage and service delivery by the Water Utilities in Kenya. The hypothesis **HO2** that financial leverage does not contribute to service delivery by the Water utilities in Kenya was therefore rejected. This was based on the statistical evidence that increasing financial leverage of the water utilities in Kenya operations decreased service delivery by 0.275 units. This finding is supported by Banafa, Muturi and Ngugi (2015) who found that leverage had a negative and significant impact on corporate financial performance and Muthuva (2009) who established that negative relationship between the equity capital ratio and profitability.

Third, the study also established significant relationship (r=602, p=0.000<0.05) between liquidity and service delivery by the Water utilities in Kenya. This implies that an increase of liquidity by 1 unit will decrease service delivery by 0.602 multiple units. The hypothesis **HO3** that liquidity does not contribute to service delivery by the Water Utilities in Kenya was therefore rejected. This was based on the statistical evidence that increasing liquidity by 1 extra unit of the water utilities in Kenya operations reduced service delivery by 0.602 units. This finding is supported by Karlsson and Svensson (2016) examined the relationship between liquidity and the capital structure of IT and real estate firms listed on the Nasqad OMX in Sweden. Kamau and Njeru (2016) in their study on effect of liquidity risk on financial performance of Insurance Companies Listed at the Nairobi Securities Exchange established there is a negative relationship between liquidity risk and financial performance for the insurance companies measured by the ROE. Eljelly (2014) found that there was a significant negative relationship between a firm’s profitability and its liquidity level. Four, the study established insignificant relationship (r=0.083, p=217>0.05) between firm size and service delivery by the Water Utilities in Kenya. The hypothesis **HO4** that firm size does not contribute to service delivery by the Water utilities in Kenya was therefore accepted. The model summary for the contribution of financial performance on service delivery by Water utilities in Kenya is as presented;

**Y**=0.126+0.481**X1**-0.275**X2**+0.602**X3**+0.083**X4** **R2**=0.2528

(.000) (.000) (.038) (.000) (0.217)

Where

**Y**= Service delivery

**X1**= Capital Adequacy

**X2**= Financial Leverage

**X3**= Liquidity

**X4**= Firm size

## 5.0 Conclusions

Water utility operations are capital intensive investment by the Ministry of Water of the Kenya Government. The aim of this study was to analyze the contribution of financial performance indicators on service delivery of Water Utilities in Kenya. The study established a significant relationship between capital adequacy and service delivery of Water Utilities in Kenya. As per the first objective, the study therefore concludes that capital adequacy contributed to service delivery of Water Utilities in Kenya. Secondly, the study established a significant relationship between financial leverage and service delivery of Water Utilities in Kenya. As per the second objective, the study therefore concludes that financial leverage contributed to service delivery of Water Utilities in Kenya. The study established a significant relationship between liquidity and service delivery of Water Utilities in Kenya. As per the third objective, the study therefore concludes that liquidity contributed to service delivery of Water Utilities in Kenya.

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