



## An assessment of the effects of corporate governance practices on the financial performance of water utility provision industries in Zambia: Case of board characteristics (2016 – 2020)

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### Abstract

Corporate governance, including board structure, transparency, audit committees, and shareholder rights, enhances organizational efficiency and accountability. However, its impact on profitability remains mixed in existing literature. In Zambia's water sector, governance inefficiencies such as non-functional boards and financial losses have led to poor service delivery and underinvestment. This study assessed how governance structures influenced financial performance in 11 commercial water utilities from 2016 to 2020. Employing a positivist philosophy, descriptive retrospective design, and quantitative methods, it analysed secondary financial and governance data. Results revealed significant positive correlations between board characteristics (size, audit committee, composition) and profitability. Nonetheless, weak board structures and high non-revenue water continued to undermine performance. The study underscores the need for governance improvements to enhance financial sustainability and service delivery, contributing to Sustainable Development Goal 6. It fills a gap in research on governance in Zambia's public utilities and offers actionable insights for policy and reform. Future studies should explore governance reforms, management practices, and technological innovations to further improve performance.

**Keywords:** Board characteristics, financial performance, water utility providers, Zambia

### Introduction

#### 1. Background of the study

Corporate governance encompasses systems and practices that guide company management and ensure accountability to stakeholders (Rahman & Hossain, 2011). Key elements include board structure, transparency, audit committees, and shareholder rights (Boubaker, 2021). Effective governance enhances fairness and efficiency (Mohamad & Muhamad Sori, 2011), improves performance and shareholder value (Pahuja & Bhatia, 2012), and mitigates agency problems (Khan, 2011). However, its impact varies by context, and common "best practices" may not always be optimal (Aguilera *et al.*, 2007; Turnbull, 2011).

The relationship between corporate governance and profitability is complex. While some studies report weak or insignificant links (Aggarwal, 2013), others show strong positive effects in sectors like banking and manufacturing (Ghaffar, 2014; Nwonyuku, 2016). Factors such as board size and CEO duality play critical roles (Kiradoo, 2019), while poor governance reduces profitability (Mahboob, 2022). Profitability can also influence the governance–firm value relationship (Permatasari & Gayatri, 2016). Overall, effective governance supports transparency and sustainable financial performance (Almashhadani, 2023; Doreswamy *et al.*, 2021).

In developing countries, commercialization of water services makes governance especially important. Although reforms aim to improve efficiency, market-based models have often failed to ensure adequate investment or production capacity (Hirschhausen *et al.*, 2004; Woo *et al.*, 2003; Uche, 2004). In Zambia, the state used commercialization to shift investment responsibility, leading to significant underinvestment (NWASCO, 2003; NWASCO, 2006). As a result, aging infrastructure remains in disrepair, and service falls short of demand (LWSC, 2020).

Despite medium-term plans estimating annual needs of US\$ 407–1,553 million, Zambia's actual investment has been only a small fraction of that (Uche, 2004). This underfunding affects sustainability, especially as high-water losses (UFW) and outdated systems raise costs. Tariff hikes, a key part of Zambia's commercialization strategy, have often been unaffordable and ineffective, with many households turning to alternative sources (Roe *et al.*, 2003; World Bank, 2003). Without sufficient public investment, financial and service goals remain unmet. Evidence from developed economies shows that good governance, alongside strong investment, is essential for a sustainable water sector (Komives *et al.*, 2005; Dore *et al.*, 2004).

#### 2. Statement of the problem

The Office of the Auditor General (2019) highlighted governance inefficiencies in Zambia's water utilities, with several companies lacking functioning Boards of Directors. Eastern Water and Sewerage Company (EWSC) operated without a Board since March 2016, while Mulonga and Lukanga's Boards were dissolved in December 2015. Financial audits showed substantial non-revenue water (NRW) losses of K54 million at Chambeshi (2016–2018) and K186 million at Luapula (2017–2018), well above the 20–25% benchmark. EWSC, Nkana, and others also reported operating losses due to expenses exceeding turnover. This study examined how corporate governance influences profitability in these utilities (Auditor General, 2019).

#### 3. Aim of the study

The study aimed to assess the effects of corporate governance practices on the profitability of public water utility companies in Zambia.

#### 4. Significance of the study

Good governance is essential to achieving SDG 6 of the 2030 Agenda, which promotes universal access to water and sanitation. To enhance service delivery, Zambia introduced reforms, including the 1997 Water Act and Corporate Governance Guidelines. This study highlights challenges in implementing these reforms and proposes policy-relevant solutions. While governance has been explored in other sectors, little attention has been given to commercial utilities (CUs) in the water sector. This research fills that gap, showing how governance improves utility performance. It also benefits consumers by addressing mismanagement and

shortages, supporting NWASCO’s push for stronger utility management and more reliable services.

#### 5. Conceptual Framework

In Figure 1, the independent variables (board characteristics like size, composition, and audit committee composition) influence the intermediate variables (planning documents, board attendance, expenditure, and budget variance), which then impact the dependent variable: financial performance (measured by net profit margin). Board characteristics shape operational practices, which, in turn, affect financial outcomes.

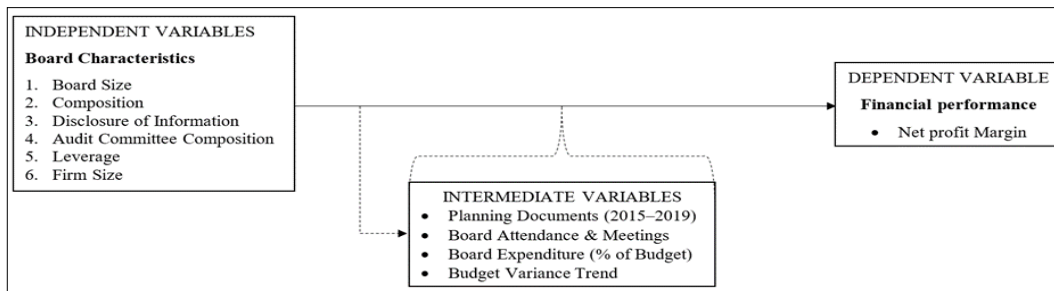


Fig 1: Conceptual Framework

#### Literature Review

Table 1 summarizes key findings from reviewed studies on governance and profitability in public water utilities, highlighting challenges like NRW, environmental regulations, and the impact of global crises. It also identifies gaps, including the long-term effects of governance reforms and the role of technology in enhancing efficiency

Table 1: Summary of Reviewed Studies

Author (Year)	Key Findings	Gaps
Garad <i>et al.</i> (2021) <sup>[15]</sup> ; Adhitya <i>et al.</i> (2022) <sup>[3]</sup>	Strong governance enhances profitability by ensuring prudent financial management, minimizing waste, and improving transparency through independent oversight and stakeholder engagement.	Long-term impact of governance practices on profitability and their cross-regional applicability.
Salsabila & Adhariani (2022) <sup>[28]</sup>	Corporate governance attracts investment by mitigating risks, particularly through adherence to environmental regulations, boosting profitability.	Few studies on the role of environmental regulations in specific regions and sectors.
Mumba & Kazonga (2021) <sup>[23]</sup> ; Evaristo <i>et al.</i> (2023) <sup>[13]</sup>	Weak governance structures, along with high levels of NRW, hinder operational efficiency and financial sustainability in Zambia’s water utilities.	Exploring effective technology and governance reforms to reduce NRW and improve financial performance.
Adam <i>et al.</i> (2023) <sup>[11]</sup> ; Carriço & Ferreira (2021) <sup>[10]</sup>	Governance frameworks, especially focusing on procurement integrity and efficient tariff structures, are essential to address corruption and ensure financial stability in Latin America and Zambia.	Long-term financial stability impacts and the effectiveness of tariff adjustments in improving water utility revenue.
Kuria <i>et al.</i> (2024) <sup>[20]</sup>	The COVID-19 pandemic has strained resources, delayed infrastructure maintenance, and affected service delivery in Zambia, impacting profitability.	The impact of global health crises on the financial stability and efficiency of public water utilities.
Ortega-Ballesteros <i>et al.</i> (2021) <sup>[26]</sup>	Advanced technology can reduce NRW and improve operational efficiency, which contributes to higher revenue generation in Zambia’s water utilities.	Long-term effectiveness of technology implementation on reducing NRW and enhancing profitability.

#### Research Methodology

This study adopted a positivist research philosophy, focusing on objectivity and empirical data to analyze the governance and operational performance of public water utilities in Zambia from 2016 to 2020. A descriptive retrospective design was used to examine historical governance practices and their correlation with utility performance, relying on official financial documents as the primary data source. A census-based, non-probabilistic sampling technique was employed. The study followed a deductive approach to test established theories on corporate governance's impact on financial performance, using a quantitative method to analyze secondary financial and governance data. Statistical techniques, including descriptive, correlation (<0.05), and regression analyses (<0.05), were conducted with Stata version 14.0 software.

The target population comprised 11 commercial water utilities in Zambia, with data from 2016 to 2020. Ethical considerations, including confidentiality and transparency, were upheld throughout, with no human participants involved.

#### Data Analysis and Presentation of Findings

##### 1. Data Analysis

Data analyses consisted of univariate, bivariate, multiple linear regression, and document review.

##### 1.1. Univariate Analysis

In Table 2 the mean was reported because the normality test results indicate that Board Characteristics significantly deviate from normality (skewness = 0.03, kurtosis = 0.2,  $\chi^2$

= 6.2,  $p = 0.05$ ), while Net Profit Margin appears normally distributed (skewness = 0.8, kurtosis = 0.1,  $\chi^2 = 2.7$ ,  $p = 0.265$ ). Further, Table 2 shows the board characteristics and net profit margins of various utilities from 2016 to 2020. Board size for LWSC decreased significantly, while net profit margin fluctuated, turning negative in 2020. NWSC's board composition remained steady, with a marked profit

recovery in 2020. KWSC experienced volatility in CSR disclosure and profit margins, with a sharp decline in 2020. MWSC's audit committee composition and profit margins showed minimal change, dipping into negative in 2020. LGWSC's leverage ratio increased slightly over the years, and SWSC showed relatively stable firm size but declining profit margins in 2020.

**Table 2:** Board Characteristics and Profitability/Financial Performance (2016-2020)

Board Characteristics	Year	Mean	Std	Utility	Net Profit Margin
Board Size (Total number of directors)	2016	9.6	0.3	LWSC	-0.116
	2017	9.2	0.1	LWSC	0.2675
	2018	5.8	0.3	LWSC	0.09
	2019	5.8	0.5	LWSC	0.06
	2020	5.8	0.5	LWSC	-0.23
Board Composition (Ratio of either gender to the total number of board members)	2016	0.1	0.1	NWSC	-0.3001
	2017	0.1	0	NWSC	-0.1615
	2018	0.1	0.1	NWSC	-0.1
	2019	0.2	0.1	NWSC	-0.1
	2020	0.2	0.1	NWSC	0.4
Disclosure of Information (Disclosure of Corporate Social Responsibility Activities)	2016	0.3	0.2	KWSC	0.1
	2017	0.4	0.1	KWSC	-0.0
	2018	0.3	0.1	KWSC	0.2
	2019	0.8	0.1	KWSC	0.2
	2020	0.9	0.1	KWSC	-0.3
Audit Committee Composition (Ratio of female directors to total audit committee members)	2016	0.1	0.1	MWSC	0.1
	2017	0.1	0.1	MWSC	0.1
	2018	0.1	0.1	MWSC	0.0
	2019	0.2	0.1	MWSC	0.0
	2020	0.2	0.1	MWSC	-0.1
Leverage (Ratio of total liabilities to total assets)	2016	0.1	0	LGWSC	-0.0
	2017	0.1	0.1	LGWSC	-0.0
	2018	0.1	0.2	LGWSC	-0.1
	2019	0.2	0.2	LGWSC	0.0
	2020	0.2	0.5	LGWSC	0.0
Firm Size (Log of total assets)	2016	9.3	3.4	SWSC	0.1
	2017	9.2	3.8	SWSC	0.1
	2018	9.2	3.5	SWSC	0.1
	2019	8.9	3.1	SWSC	0.0
	2020	9.3	2.9	SWSC	-0.0

**1.2. Bivariate Analysis**

Table 3 indicates significant positive correlations between board characteristics and financial performance, with board size ( $r = 0.567$ ,  $p = 0.001$ ), audit committee composition ( $r = 0.618$ ,  $p = 0.001$ ), and board composition ( $r = 0.418$ ,  $p = 0.001$ ) showing strong links. Disclosure of information ( $r = 0.298$ ,  $p = 0.014$ ) also correlates positively, while leverage ( $r = 0.067$ ,  $p = 0.003$ ) shows a weaker connection.

**Table 3:** Board Characteristics and Financial Performance

Board Characteristics	Financial performance	
	r	P
Size	0.567	0.001
Composition	0.418	0.001
Disclosure of Information	0.298	0.014
Audit Committee Composition	0.618	0.001
Leverage	0.067	0.003

**1.3. Multiple Linear Regression**

Table 4 presents the results of a multiple linear regression model in the unstandardized Coefficients (B) and standardized Coefficients ( $\beta$ ), showing the relationship between board characteristics and financial performance. The significant independent variables included Board Size

with a coefficient of 2.6 ( $p = 0.001$ ), Composition (coefficient = 0.5,  $p = 0.015$ ), Disclosure of Information (coefficient = 0.4,  $p = 0.021$ ), Audit Committee Composition (coefficient = 0.6,  $p = 0.007$ ), and Firm Size (coefficient = 1.6,  $p = 0.023$ ). Leverage has a negative coefficient but is significant ( $p = 0.001$ ). The constant is -2.3 ( $p = 0.001$ ).

**Table 4:** Multiple linear regression

Board	B	$\beta$	t	P
Constant	-2.3	0.2	-5.4	0.001
Size	2.6	0.1	3.6	0.001
Composition	0.5	0.1	3.8	0.015
Disclosure o	0.4	0.1	3.7	0.021
Audit	0.6	0.1	6.8	0.007
Leverage	-0.0	0.0	-6.7	0.001
Firm Size	1.6	0.1	4.0	0.023

**1.4. Document Review**

Table 5 shows that while most CUs consistently submitted planning documents between 2015 and 2019, gaps were noted at CHWSC (no audited reports), NWWSC (missing from 2017), and WWSC (missing in 2015–2016). LWSC

demonstrated the strongest governance with 92–100% board attendance, 3–7 meetings annually, moderate board expenditure (0.2–0.4% of budget), and low budget variance (0.12–29%). NWSC also maintained good performance with 80–95% attendance and similar expenditure levels, though it faced higher budget variances (25–41%). In contrast, KWSC, MWSC, LGWSC, and SWSC had very low

attendance (0–1%) and minimal board expenditure (as low as 0.001%), though some improvement occurred over time, especially at SWSC. CHWSC and NWWSC had inconsistent performance and engagement, with board spending not exceeding 0.044%. WWSC, initially weak, improved after 2017, with regular meetings, increased documentation, and reduced budget variance to 0.05%.

Table 5

CU	Planning Documents (2015–2019)	Board Attendance & Meetings	Board Expenditure (% of Budget)	Budget Variance Trend	General Performance Summary
LWSC	All documents presented annually	High (92–100%), 3–7 meetings/year	Moderate (0.2–0.4%)	Consistently low (0.12–29%)	Strong governance and financial control
NWSC	All documents presented annually	Moderate (80–95%), 3–4 meetings/year	Higher (0.3–0.4%)	Fluctuating (25–41%)	Good governance; higher budget variance
KWSC	All documents present annually	Very low attendance (0–1%), meetings increased over time	Very low (0–0.004%)	Improving (0.06–0.38%)	Poor early performance, slight improvement later
MWSC	All documents present annually	Very low to modest (0–1%), increased meetings in 2018–19	Very low (0–0.004%)	Improving slightly (0.16–0.6%)	Initially inactive board, increased engagement over time
LGWSC	All documents present annually	Low to moderate (0–1%), 1–4 meetings/year	Very low (0.001–0.019%)	Inconsistent (0.01–0.36%)	Modest board activity with fluctuating financial control
SWSC	All documents present annually	Very low to increasing (0–1%), up to 6 meetings/year	Very low (0–0.012%)	Improving (0.05–0.3%)	Low board activity early, improved in later years
CHWSC	No audited reports (2015–2019)	Low to moderate (0–1), 0–5 meetings/year	Very low (0–0.003%)	Relatively stable (0.1–0.2%)	Missing key documents, moderate board effort
NWWSC	Audited reports missing from 2017	Low to moderate (0–1), 0–3 meetings/year	Very low (0–0.044%)	Variable (0.06–0.3%)	Inconsistent performance and reporting
WWSC	Audited reports missing (2015–2016)	Very low to moderate (0–1), improved from 2017	Very low (0–0.007%)	Improving (0.05–0.34%)	Initially weak, improved documentation and governance from 2018

**2. Corporate Governance and Profitability**

The study’s findings highlight the significant impact of corporate governance practices on the profitability of Zambia’s public water utilities. Key governance factors like board size, composition, audit committee composition, and transparency were found to positively affect profitability, whereas high leverage had a negative impact. These findings align with those of Garad *et al.* (2021)<sup>[15]</sup> and Adhitya *et al.* (2022)<sup>[3]</sup>, who assert that strong governance practices contribute to profitability by ensuring efficient financial management and reducing waste. This demonstrates a common understanding in the literature that governance structures, such as well-organized boards and committees, can drive financial success by providing oversight and strategic direction. However, the study on Zambia’s utilities focuses more on the specificity of board actions (e.g., planning, meetings, and expenditure), which reflects a more subtle, micro-level look at governance practices. This complements Garad *et al.* (2021)<sup>[15]</sup> and Adhitya *et al.* (2022)<sup>[3]</sup>, who emphasize prudent financial management and independent oversight, but suggest that active governance actions, such as frequent meetings and appropriate expenditure, are pivotal in the operational environment of public utilities.

**3. Governance Actions and Their Immediate Impact**

The study also found that active governance actions, such as frequent board meetings and well-structured committees, lead to better financial outcomes. This emphasizes the importance of governance actions as intermediaries between board structure and profitability. This perspective is reinforced by Mumba & Kazonga (2021)<sup>[23]</sup> and Evaristo *et al.* (2023)<sup>[13]</sup>, who argue that weak governance structures contribute to inefficiency and hinder financial sustainability,

especially in Zambia’s water utilities. The active role of governance bodies, highlighted in the study, reflects a broader understanding in the literature that governance is not a static entity but requires dynamic and continuous involvement to ensure financial health.

**4. Leverage and Profitability**

The study identifies high leverage as a negative factor influencing profitability. This aligns with the findings of Mumba & Kazonga (2021)<sup>[23]</sup>, who point out the challenges posed by poor governance structures in Zambia’s public utilities, leading to financial instability. However, the negative effect of leverage was not extensively discussed in the other studies reviewed, particularly those by Adam *et al.* (2023)<sup>[1]</sup> and Carriço & Ferreira (2021)<sup>[10]</sup>, who focus on procurement integrity and tariff structures. These studies suggest that financial stability may also depend on the effective structuring of tariffs and procurement processes, indicating that while leverage is a crucial determinant, broader financial management mechanisms also play a critical role.

**5. Technology and Operational Efficiency**

Ortega-Ballesteros *et al.* (2021)<sup>[26]</sup> found that the implementation of advanced technology in water utilities significantly reduces non-revenue water (NRW), improving operational efficiency and profitability. This is consistent with the study’s findings that better planning and operational strategies lead to stronger financial outcomes. However, the study does not explicitly focus on technology as a governance strategy, which is a notable gap when compared to the findings of Ortega-Ballesteros *et al.* (2021)<sup>[26]</sup>, who emphasize the role of technology in long-term financial success. This suggests that integrating technology

with governance structures might further enhance profitability and operational efficiency in Zambia's water utilities, an area for further research.

## 6. Governance and External Shocks

Kuria *et al.* (2024)<sup>[20]</sup> explored how external shocks, like the COVID-19 pandemic, affected the financial stability and operational capacity of Zambia's water utilities, highlighting resource strain and delayed infrastructure maintenance. While the study at hand does not directly address the pandemic's impact, it can be inferred that governance practices might mitigate such shocks by fostering adaptive strategies and risk management frameworks. The intersection of governance resilience and external shocks, as noted by Kuria *et al.* (2024)<sup>[20]</sup>, is an area where corporate governance could help utilities weather crises and safeguard profitability.

## 7. Environmental Regulations and Investment

The study by Salsabila & Adhariani (2022)<sup>[28]</sup> suggests that governance structures that ensure compliance with environmental regulations attract investment and boost profitability. This link between governance, regulation, and financial performance is not directly discussed in the study on Zambia's water utilities, yet it offers an interesting avenue for future exploration. Ensuring compliance with environmental standards could be an additional dimension of good governance that influences profitability, especially in sectors with substantial environmental impact like water utilities.

## Conclusion and Recommendations

### 1. Conclusion

The study assessed the impact of corporate governance practices on the profitability of public water utilities in Zambia and found that factors such as board structure, transparency, and active governance actions significantly influenced financial outcomes. It demonstrated that well-organized boards and committees, along with prudent financial management, contributed to higher profitability, while high leverage negatively impacted financial performance. Overall, the study highlighted the crucial role of strong governance mechanisms in ensuring the financial sustainability and operational efficiency of Zambia's public water utilities.

### 2. Recommendations

The following recommendations aim to enhance corporate governance and ensure long-term sustainability in Zambia's public water utilities:

- **Policy Recommendation:** The Zambian government should implement a national policy requiring periodic evaluations and improvements to corporate governance within public water utilities. This policy should focus on strengthening board transparency, audit committees, and active governance practices to promote long-term financial sustainability and better service delivery.
- **Target Population Recommendation:** These recommendations target board members, senior management, governance bodies of public water utilities, and relevant regulatory agencies. Training and workshops should be provided to enhance their understanding of effective governance practices, while

polymakers should play an active role in monitoring and enforcing governance standards across all public utilities.

## 3. Suggestion for future studies

Future studies should explore the long-term impact of governance practices on the profitability and sustainability of Zambia's public water utilities, investigate the role of technology in enhancing governance and operational efficiency, and examine the cross-regional applicability of these practices in similar utility sectors.

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