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An Assessment of the Factors Affecting Economic Sustainability of State-Owned Enterprises: a developing Country's perspective

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Abstract. *The role of State Owned Enterprises (SOEs) is very important in the provision of basic services as well as social goods. However, despite their importance, most SOEs, especially in developing countries, are battling with heavy debt, failure to cover their operational costs and expenditure, thereby threatening their economic sustainability. This study sought to assess the factors that affect the economic sustainability of state-owned enterprises in Zambia. The methodological approach adopted for this study was quantitative in nature, with data collected from 100 employees sampled from SOEs as well as the Zambia Development Agency (ZDA). Data collected was analysed using descriptive statistics as well as exploratory factor analysis. The findings revealed that, marketing (beta = .222, p-value of 0.032) and technology (beta = -.296, p-value of 0.004) affect the economic sustainability of state-owned enterprises. More so, the measurement items explaining each of the five variables were postulated. The study further found lack of funding, poor management practices, unfavourable government policies, market competition and unstable economic conditions to be the main challenges militating against the sustainability of SOEs. The study therefore recommends promotion of partnerships between the SOEs and the private sector in technological innovation and adoption. Moreso, for state-owned enterprises to grow their customer base, there is a need to develop competitive marketing strategies. This paper informs policymakers and bureaucrats on how to improve the productivity and profitability of state-owned enterprises.*

Keywords: Economics, Marketing, State-owned Enterprises, Sustainability, Technology

JEL Codes: F63, H11

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1. Introduction

A State-owned Enterprise (SOE) is a for-profit commercial inclined legal entity that is controlled and partially or wholly owned by the government, at the central/federal, state or local level (Nerea and Hadaro,



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2019; Cuervo-Cazurra and Li, 2021). State-owned enterprises are important to the success of an economy as they create employment, which, in turn enables people to earn an income necessary to meet their basic needs. SOEs support the production and delivery of quality and adequate goods and services (Todaro and Smith, 2015). They also play a vital role in the development of key infrastructure such as roads, schools and hospitals. Further, they generate revenue for the government through the payment of taxes, royalties and other fees. In the world today, many SOEs are often hybrid organisations that have elements of state ownership and control on one hand and private participation and control on the other hand (Bruton et al., 2015).

In Sub-Saharan African (SSA) countries, SOEs account for a significant share of the public sector balance sheets, with liabilities worth an average of 20 percent of GDP, and assets of about 32 percent of GDP (Harris et al, 2020). Additionally, SOEs are often a key player in strategic sectors; these include extraction and processing of natural resources, operation of strategic infrastructure such as airports and ports, provision of transport services such as national airlines and railways, and purchase and resale of agricultural commodities. In some cases, SOEs occupy a monopoly market position and are often an important source of employment. However, despite the importance of national development, SOEs have been cited to be struggling in the attainment of economic sustainability (Trimble et al., 2016; Wezel and Carvalho, 2022; Kaunda and Pelsler, 2023). Meanwhile, most studies in Zambia focus on the effects of corporate governance on state-owned enterprises (Mulenga, 2024; Luputa and Mwanza, 2022; Mumba and Kazonga, 2021). Others have looked at decision-making, such as Phiri (2022), however, no study has endeavoured to look at factors that affect the economic sustainability of SOEs. This study, therefore, sought to determine the factors affecting the economic sustainability of state-owned enterprises in developing countries using Zambia as a case study.

2. State-Owned Enterprises in Sub-Saharan African Countries

Most SOEs in SSA are persistently unprofitable and face liquidity constraints, giving rise to a need for sustained and significant bailouts (Trimble et al., 2016). In some cases, these financial difficulties are exacerbated by the need for SOEs to carry costly public policy mandates, for which they are uncompensated. As a result, SOEs have become an important source of fiscal risks. SOEs in SSA are in high debt, and this has greatly affected their operations (IMF, 2020). In Madagascar, for instance, the highly indebted JIRAMA (electricity and water utilities) received about 1.1 percent of GDP in subsidies from the government in 2014 (Harris et al, 2020). In São Tomé and Príncipe, a similar web of payment arrears amounting to close to 20 percent of GDP emerged as a result of SOE underperformance and weak governance (Wezel and Carvalho, 2022). In Ghana, between 2013-14, SOEs energy-sector, suffered cash flow difficulties from a combination of adverse factors (exchange rate depreciation, higher oil prices, and a drought-related switch to higher cost thermal electricity generation). To deal with this situation, the SOEs borrowed short-term loans from banks while also postponing payments to fuel suppliers. Notwithstanding these steps, eventually a quarter of bank loans to the energy sector became non-performing (IMF, 2020). In extreme cases, the SOE had to be closed or privatized. The Cape Verdean national airline, TACV, is a case in point which ended up being privatized. SAA is another example, but it is still in state ownership.

Another challenge SOEs in SSA experience, is that when an enterprise is fully owned by the government, the shareholder has unrestrained power, which invariably leads to abuse (Kaunda and Pelsler,



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2023). Political officials interfere not only with the appointment of directors and top management but also with the procurement process and the day-to-day operations of these enterprises. Further, Balbuena (2014) adds that the lack of supervision, monitoring and stakeholder engagement in operations of SOEs has affected their economic sustainability. Even though many SOEs in sub-Saharan Africa are reportedly experiencing operational challenges, there are examples of SOEs that are well-managed, profitable and add value to the economy. In Seychelles, most SOEs are low-risk, viable companies contributing about 0.5 percent of GDP in net transfers to the budget in 2018 (Wezel and Carvalho, 2022). Over and above SOE reforms aimed at addressing operational and governance deficiencies, some governments have attempted to improve transparency and accountability by publishing aggregate SOE reports that allow the public to assess the SOE sector's performance at a glance (Wezel and Carvalho, 2022).

2.1. State-owned Enterprises in Zambia

SOEs in Zambia operate in a range of industries and include some of the largest formal sector employers. They dominate key sectors, including energy, communications, transportation, and media. SOEs also play a major role in finance and mining. Significant SOEs include: Zambia Telecommunications Corporation (ZAMTEL), Zambia Electricity Supply Corporation Limited (ZESCO), Zambia Postal Services Corporation (ZAMPOST), Zambia Railways (ZR), Zambia National Commercial Bank (ZANACO), Development Bank of Zambia (DBZ), Zambia National Broadcasting Corporation (ZNBC) and Zambia Consolidated Copper Mines-Investment Holdings (ZCCMIH). The government is the sole owner of 26 companies, with 25 held at the national level. The government shares ownership in 14 SOEs (with a minority stake in 7) (Mwanawasa, 2016). Under current plans, most of these companies will remain under state ownership for the indefinite future.

At independence, in 1964, Zambia only had 14 SOEs, accounting for only 14% of the economy, and the rest were in the hands of the private sector (Malisase, 2020). The number of SOEs increased to 288 by 1991. Even with the increase in the number of SOEs, the SOEs were financially unviable and costing the taxpayers colossal sums in bailouts (Fundanga and Mwaba, 1997: 6). For instance, in 1988, the government spent over K3.5 billion, bailing out loss-making SOEs (Malisase, 2020). State-owned enterprises also lacked competitiveness, as most sectors were dominated by monopolies. Additionally, the SOEs also produced inadequate and poor-quality products and services (Larmer, 2010: 39). Labour utilization in SOEs was very low as most SOEs employed surplus workers as a way of rewarding political supporters and freedom fighters (Chigunta et al., 1998).

3. Theoretical Approach

The theoretical perspective anchoring this study is based on agency theory. The Theory is concerned with understanding the relationships between agents (managers) and principals (owners/shareholders or the government in the case of this study). The argument behind this theory is that in the principal-agent relationship, the managers promote the best interests of the governments or shareholders rather than in the interest of all other stakeholders (Gwala and Mashau, 2023). In this relationship, owners earn profits from the firm while managers earn a wage. Managers, therefore, make decisions that ensure the success of the firm in order to keep earning a wage. This enables owners to have control over managers. The agency theory is applicable for this study as it emphasizes the need for an effective control mechanism to



prevent the agent from acting in his or her own interest at the expense of the principal, as well as by taking into considerations the need of other stakeholders such as the general public who too can claim ownership of state-owned enterprises apart from being beneficiary of the services provided by SOEs. This implies that economic sustainability can be enhanced when the interests of all actors and stakeholders are properly taken care of. Chikuta (2020) argues that the objective of an organization ought to be to prosper the organization together with the entirety of its key partners. This theory is relevant to this study in that it enables firms to make enhanced, proper decision-making processes that protect the interests of all the stakeholders.

4. Economic Sustainability

Economic sustainability has been defined by Giovannoni and Giacomo (2013) as the capability of a corporation to last in time; in areas of profitability, productivity and financial performance. The core idea is how organisations stay in business. According to Solin (2017), economic sustainability is concerned with meeting the economic needs of the present without diminishing the economic needs of the future. Economic sustainability entails that economic systems support sustainable social and environmental outcomes, where economics is the process through which humans create social and environmental outcomes. Thus, economic sustainability means the use of various strategies for employing existing resources optimally so that a responsible and beneficial balance can be achieved over the longer term (Jeronen, 2020). In order to achieve high levels of economic sustainability, it is important that enterprises pay particular attention to the social and environmental aspects of sustainability. This is because firms do not exist alone. Paying attention to the interests of the different stakeholders (customers, employees, communities and shareholders) enhances economic sustainability.

4.1. Variable selection

The variables/constructs adopted in this study were informed by similar works by Giovannoni & Giacomo (2013), Balbuena (2014), Chilenga (2016), Muzapu (2016), Othman & Abdullah (2016), Tirole (2017), Solin (2017), Bwalya (2019), Schoen & Schramade (2019), Chiputa (2020), Akan and Tevfik (2020), Jeronen (2020), Lee and Kim (2020), Weston & Nnadi (2023), Marimuthu (2020), Lopez (2020), Zavattaro (2021), Anwar & Abdullah (2021), Katou et al. (2021), Mumba & Kazonga (2021), Martin (2022), Luputa (2022), Seran et al. (2022), Banda (2022), as well as Hayes (2023). From the literature reviewed, a summary of the factors which support the economic sustainability of state-owned enterprises is shown in Table 1.

Table 1: Measurement variables of economic sustainability in SOEs

Variable	Measurement	Author
Corporate Governance	Transparency	Chiputa, 2020; Mumba and Kazonga, 2021; Muzapu, 2016; Balbuena, 2014;
	Accountability	Auditor General's Report on parastatals, 2020;
	Monitoring and supervision	Martin, 2022; Luputa, 2022
	Strategic plan	
	Board diversity	
	Board independence	



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Variable	Measurement	Author
Technology	Adoption of Artificial Intelligence	Bwalya, 2019; ZICTA Report, 2018; Gilchrist, 2016; Jadzi, 2014; Calvahal and Cazarini, 2020
	Internet of Things for real-time monitoring	
	Cloud computing for data accessibility	
	Demand forecasting using big data analytics	
	Reliable internet infrastructure	
	Cyber Physical Systems for improved decision making	
Marketing	Branding	Lopez, 2020; Zavattaro, 2021; Lee and Kim, 2020; Bwalya, 2019
	Customer needs	
	Quality products	
	Variety of products	
	Social media	
	Promotions	
Human Resource Capacity	Adequate staff	Anwar and Abdullah, 2021; Seran et al, 2022; Othman and Abdullah 2016; Mutale et al. 2020; Katou et al, 2021; Banda, 2022
	Continuous professional development	
	Motivation	
	Strategic hiring of staff	
	Forecasting	
	Succession planning	
Corporate Finance	Profit maximization	Tirole, 2017; Schoen and Schramade, 2019; Weston and Nnadi, 2023; Marimuthu, 2020; Chilenga, 2016; Hayes, 2023; Akan and Tevfik, 2020
	Purpose driven	
	Stakeholder value	
	Investments	
	Fundraising	
	Return on assets	
Economic sustainability	High return on investments	Giovannoni and Giacomo, 2013; Solin, 2017; Jeronen, 2020
	Low debt levels	
	High rate of innovation	
	High levels of human capital development	
	Robust risk management systems	

(Source: Authors' literature review)



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Corporate governance

Corporate governance has been cited to play a critical role in the economic sustainability of SOEs. He et al. (2015) in their study, comparing the performance of state-owned enterprises and non-state-owned enterprises, found that inefficiencies due to corporate governance were more in SOEs. Another study by Heo et al. (2018) pointed out that corporate governance attributes such as board size and composition, corporatization, transparency and disclosure have a significant effect on the performance of state-owned enterprises. Likewise, Hermanto et al. (2021) argue that the firm's or SOEs' value is influenced by its corporate governance. Based on the aforementioned viewpoint, this study posits that;

H1. Corporate governance does support the economic sustainability of SOEs

Technology

Embracing digitalization has been advanced to be a key factor in achieving financial stability and sustainability of state-owned enterprises (Rakhmonov and Choriev, 2022). A study by Jin and Wu (2024) claims that digital transformation (technology) contributes to improved performance of state-owned enterprises in areas of environmental, social, as governance. This implies that technology contributes to the economic sustainability of state-owned enterprises; therefore, the following hypothesis has been deduced in this study;

H2. Technology does support economic sustainability for SOEs.

Marketing

Marketing capability has been pointed out to be among the critical factors contributing to an organization's competitive advantage. The argument is that state-owned enterprises need to be innovative and dynamic in their marketing strategy and capabilities if they are to enjoy a good market share, which consequently is expected to contribute to their economic sustainability. Based on this viewpoint, the following hypothesis has been advanced;

H3. Marketing does support the economic sustainability of SOEs.

Corporate Finance

Financial management practices have been cited to contribute to the performance of state-owned enterprises (Kaino et al., 2025). The argument is that shunning the best financial management practices can compromise the economic sustainability of state-owned enterprises. Charmaine et al., (2024) in their study pointed out corruption, lack of transparency, as mismanagement of funds to be some of the key practices contributing to mismanagement of finances in SOEs. The main argument is that SOEs should be protected from economic mismanagement and embezzlement by implementing effective financial measures through the promotion of corporate financial management. Based on this viewpoint, that study posits that;

H4. Corporate finance does support the economic sustainability of SOEs.



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Human Resource Capacity

Considering the increased market competition and constantly changing market environment, the need to have competent human resources is key and significant for business continuity as well as sustainability (Heravi et al., 2023). Human resource capacity and systems have been argued to be key in enhancing proper management of state-owned enterprises as well as attainment of business efficiency (Muzapu et al., 2016). With the foregoing, the following hypothesis has been formulated in this study;

H5. Human resource capacity does support the economic sustainability of SOEs.

5. Methodology

The main aim of this research was to assess the factors that affect the economic sustainability of state-owned enterprises in Zambia. In realizing that aim, this study adopted a cross-sectional descriptive design with a quantitative approach. Data was collected using a structured questionnaire containing closed-ended questions from a total of 100 employees sampled from SOEs, as well as the Zambia Development Agency (ZDA). Random sampling was used in selecting respondents who included those in top, middle and low management levels. To measure the respondents' agreement levels, statements were rated on a five-point Likert scale. Likert-type or frequency scales use fixed-choice response formats and are designed to measure opinions (Wegner, 2012). The scale of 1 to 5 was used, where 1 = To no extent (≥ 1.00 and ≤ 1.80); 2 = To some extent (≥ 1.81 and ≤ 2.60); 3 = Moderate extent (≥ 2.61 and ≤ 3.40); 4 = Large extent (≥ 3.41 and ≤ 4.20), and 5 = Very large extent (≥ 4.21 and ≤ 5.00). For data analysis, the methods employed included descriptive statistics, exploratory factor analysis and regression analysis. Factor analysis was performed in order to understand the items explaining each variable (factor). Regression analysis was carried out to explain the causality between the independent variables and the dependent variable, the economic sustainability of state-owned enterprises.

6. Results

Among respondents who took part in the study, 68.2 percent had a bachelor's degree, followed by diploma holders (11.4 percent). Those with a Master's degree comprised 10 percent, while the least were Ph.D. holders at about 1 percent. In terms of management level, most respondents were in middle management (52 percent), followed by those in lower management with 20 percent, 13 percent were in top management, whereas 15 percent did not indicate, as shown in Figure 1.

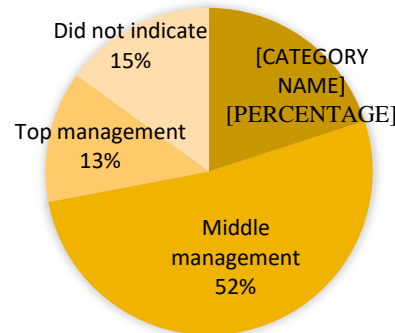


Figure 1: Respondents' positions in SOEs
 (Source: Authors' calculation)

6.1. Descriptive Statistics

The descriptive statistics for the study's variables provide insights into their central tendency and variability, focusing on the corporate governance system, technology, human resource capacity, marketing and corporate finance. Each of the five variables had a valid sample size of 88 responses, with no missing data, ensuring the analysis covered all participants equally. The mean values reveal the general level of agreement or the extent to which the factors are perceived as being important. Among the five variables, marketing had the highest mean score of 2.89, suggesting that it was perceived to have a moderate level of contribution to the economic sustainability of SOEs, the lowest score was recorded at 2.58 for the variable corporate governance. Likewise, the other remaining variables were in the range of 2.86 to 2.82. Overall, the results suggested that all five variables were perceived as being important in the economic sustainability of SOEs, as shown in Table 2; therefore, all the variables were retained for further analysis.

Table 2: Factors supporting the economic sustainability of SOEs

To no extent (≥1.00 and ≤1.80)	N	Minimum	Maximum	Mean	Std
To some extent (≥1.81 and ≤2.60)					Deviation
Moderate extent (≥2.61 and ≤3.40)	Statistic	Statistic	Statistic	Statistic	Statistic
Large extent (≥3.41 and ≤4.20)					
Very large extent (≥4.21 and ≤5.00)					
Marketing	88	1	5	2.89	.850
Technology	88	1	5	2.86	.790
Corporate finance	88	1	5	2.84	.856
Human resource capacity	88	1	5	2.82	.852
Corporate governance systems	88	1	5	2.58	.979

(Source: Authors' research)



The variability of responses is reflected in the standard deviations, which measure the dispersion around the mean. Inspection of the results revealed that the standard deviations for all the variables were less than 1, implying relatively consistent responses across the participants. Kurtosis values provide insights into the shape of the distribution of responses. Economic sustainability (-.456) and corporate governance system (-.808) had negative kurtosis values, suggesting flatter distributions than the normal distribution, indicating a wider range of responses. On the other hand, technology (.574), human resource capacity (.255), marketing (.599), and corporate finance (.666) had positive kurtosis values, indicating more peaked distributions where most responses clustered around the mean.

6.2. Exploratory Factor Analysis

An EFA was conducted to assess the unidimensionality and reliability of each factor. Principal components with Varimax rotation were specified as the extraction and rotation methods, respectively. The results revealed that the attributes of all the factors had Kaiser-Meyer-Olkin (KMO) values in the range of 0.702 to 0.864. Moreover, the Bartlett's test of sphericity was found significant ($p = 0.000$), as shown in Table 3. This indicated that the factor analysis was appropriate (Chisumbe et al., 2024; Mwanaumo et al., 2024).

Table 3: KMO statistics

KMO and Bartlett's Test						
		Corporate governance	Technology	Marketing	Corporate finance	Human resource capacity
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.702	.864	.811	.753	.725
Bartlett's Test of Sphericity	Approx. Chi-Square	567.443	754.321	925.467	703.112	432.876
	Df	38	55	36	28	21
	Sig.	.000	.000	.000	.000	.000

(Source: Authors' work)

The factor loadings, which represent the relationships between individual items and the underlying factors, were all above the critical threshold of 0.5. Therefore, each item was valid. In the Corporate Governance factor, the highest loading was observed for Transparency (0.743), followed closely by Strategic Plan (0.671) and Monitoring and Supervision (0.658), as shown in Table 4. These findings indicate that these attributes strongly contribute to the construct of Corporate Governance, suggesting that transparency and strategic planning are perceived as critical components.



Table 4: Factor Analysis

Factors	Undeleted items	Factor loadings
Corporate Governance	Transparency	0.743
	Accountability	0.602
	Monitoring and supervision	0.658
	Strategic plan	0.671
	Board diversity	0.535
	Board independence	0.514
Technology	Adoption of Artificial intelligence	0.788
	Internet of things for real time monitoring	0.826
	Cloud computing for data accessibility	0.654
	Demand forecasting using big data analytics	0.648
	Reliable internet infrastructure	0.673
	Cyber Physical Systems for improved decision making	0.630
Marketing	Branding	0.788
	Customer needs	0.826
	Quality products	0.654
	Variety of products	0.648
	Social media	0.673
	Promotions	0.630
Human Resource Capacity	Adequate staff	0.576
	Continuous professional development	0.655
	Motivation	0.727
	Strategic hiring of staff	0.702
	Forecasting	0.643
	Succession planning	0.658
Corporate Finance	Profit maximization	0.594
	Purpose driven	0.664
	Stakeholder value	0.729
	Investments	0.719
	Fundraising	0.637
	Return on assets	0.652

(Source: Authors' work)

For the technology factor, loadings ranged from 0.526 for adoption of Artificial Intelligence to 0.578 for reliable internet infrastructure, indicating a moderate but consistent contribution of technological



advancements like the Internet of Things for real-time monitoring and Big Data Analytics for demand forecasting to this dimension. These results suggest that respondents perceive these technologies as integral to fostering innovation and operational efficiency.

The marketing factor exhibited high loadings, with customer needs showing the strongest association at 0.826, followed by Branding at 0.788. This indicates that customer-centric strategies and branding efforts are the primary drivers of marketing effectiveness in the respondents' perception.

For human resource capacity, motivation (0.727) and strategic hiring of Staff (0.702) showed the highest loadings, underscoring the importance of employee motivation and targeted recruitment in enhancing organizational performance. Continuous Professional Development and Succession Planning also contributed significantly, indicating that ongoing development and succession readiness are valued by respondents.

In the Corporate Finance factor, the highest loadings were for Stakeholder Value (0.729) and Investments (0.719), suggesting that respondents view these financial practices as pivotal for corporate success. The presence of consistent loadings across Profit Maximization and Fundraising indicates a balanced emphasis on profitability and financial sustainability.

Therefore, the findings reflect a coherent structure across all factors, signifying that the attributes identified are strongly aligned with the constructs. This validates the robustness of the factors and highlights key areas - such as transparency, technological advancement, customer focus, human capital development, and innovation- that are perceived as critical for organizational performance and economic sustainability. Further, an inspection of the Cronbach's alpha value revealed a value of 0.785, denoting an acceptable internal reliability (Aigbavboa, 2014) as shown in Table 5.

Table 5: Reliability statistical tests

Reliability statistics	
Cronbach's alpha	Number of items
0.785	5

(Source: Authors' work)

Likewise, the corrected item–total correlation was greater than the recommended cut-off value of 0.3, suggesting that the items provided a good measure of the perceived importance of SOEs' sustainability.

6.3. Multiple Regression Analysis

The results from the multiple regression analysis examine the relationships between various predictors and the dependent variable under consideration. The analysis focuses on factors that support the economic sustainability of SOEs as shown in Table 6.



Table 6: Model summary for multiple regression analysis

Model Summary										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. Change	F
1	.449 ^a	.201	.151	.457	.201	4.034	5	80	.003	
2	.538 ^b	.289	.184	.448	.088	1.527	6	74	.181	

a. Predictors: (Constant), Corporate finance, Technology, Marketing, Corporate governance system, Human resource capacity

b. Predictors: (Constant), Corporate finance, Technology, Marketing, Corporate governance system, Human resource capacity

(source: Authors' work)

Model 1 presents the factors that support the economic sustainability of SOEs. The regression analysis yields an R value of 0.449, indicating a moderate positive correlation between the predictors and Economic sustainability (Dependent Variable). The R Square value of 0.201 suggests that approximately 20.1 percent of the variance in the dependent variable can be explained by the five predictors included in this model, which are corporate finance, technology, marketing, corporate governance system, and human resource capacity. The adjusted R Square of 0.151 accounts for the number of predictors in the model, confirming that these factors significantly contribute to explaining the variance in economic sustainability. The change statistics reveal a significant R Square change of 0.201 with a corresponding F change of 4.034 and a significance level (Sig. F Change) of 0.003. This significance indicates that the predictors in Model 1 provide a meaningful improvement in the predictive capacity of the model compared to a model with no predictors.

Analysis of Variance

The results from the ANOVA (Analysis of Variance) provide further explanation of the significance of the models developed in the multiple regression analysis, particularly regarding the factors influencing the economic sustainability of SOEs. The ANOVA tables for both Model 1 and Model 2 reveal the overall fit of the regression models and the contributions of the predictors to the explained variance, as shown in Table 7. Anova was performed to assess the overall significance of the regression model.

Table 7: ANOVA for factors supporting the economic sustainability of SOEs

ANOVA ^a						
Model	Sum Squares	of	Df	Mean Square	F	Sig.



1	Regression	4.214	5	.843	4.034	.003 ^b
	Residual	16.716	80	.209		
	Total	20.930	85			
2	Regression	6.055	11	.550	2.739	.005 ^c
	Residual	14.875	74	.201		
	Total	20.930	85			

a. Dependent Variable: Economic sustainability

b. Predictors: (Constant), Corporate finance, Technology, Marketing, Corporate governance system, Human resource capacity

c. Predictors: (Constant), Corporate finance, Technology support, Marketing, Corporate governance system, Human resource capacity.

In Model 1, the regression sum of squares is 4.214, with five degrees of freedom (df) associated with the regression predictors. This value reflects the variability explained by the model, while the residual sum of squares is 16.716, with 80 degrees of freedom. The mean square for the regression is calculated to be 0.843, which is obtained by dividing the regression sum of squares by its degrees of freedom. The F statistic for Model 1 is 4.034, indicating a statistically significant relationship between the predictors and economic sustainability, with a significance level (Sig.) of 0.003. This p-value suggests that there is strong evidence to reject the null hypothesis, indicating that at least one of the predictors contributes significantly to the model.

Regression Coefficients

In Model 1, the regression analysis aimed to examine the influence of the identified factors on economic sustainability, with the dependent variable being economic sustainability. The constant term in the model had a beta of 0.346, but it was not statistically significant, as indicated by a t-value of 0.642 and a p-value of 0.466, as shown in Table 8, suggesting that it does not contribute meaningfully to the model.

Table 8: Regression coefficients for model 1

	MODEL 1			
	Beta	S.E	t-Value	Sig.
(Constant)		.346	.466	.642
Corporate governance system	.119	.123	1.132	.261
Technology	-.296	.212	-2.938	.004
Human resource capacity	.012	.209	.110	.912



Marketing	.222	.173	2.183	.032
Corporate finance	.208	.205	1.967	.053
Economic Sustainability				
F Change	4.034			
Sig. F Change	.003			
a. Dependent Variable: Economic sustainability				

Source: Author's work

When examining the individual predictors, the corporate governance system was found to have a positive beta of 0.119. However, its t-value of 1.132 and the associated p-value of 0.261 suggest that it does not have a statistically significant effect on economic sustainability at the 5% significance level. This means that variations in corporate governance practices do not have a strong influence on economic sustainability within the context of this model.

Technology, on the other hand, showed a negative beta of -0.296, with a t-value of -2.938 and a p-value of 0.004. This indicates a statistically significant negative relationship between technology and economic sustainability. A higher level of technological implementation appears to correlate with lower economic sustainability in this model, which may warrant further investigation into how technological factors affect economic sustainability in the given context.

Human resource capacity exhibited a very small positive beta of 0.012, accompanied by a t-value of 0.110 and a p-value of 0.912. The lack of statistical significance (p-value greater than 0.05) indicates that human resource capacity does not significantly affect economic sustainability in this model.

Marketing, with a beta of 0.222, showed a statistically significant positive relationship with economic sustainability, as evidenced by its t-value of 2.183 and a p-value of 0.032. This suggests that stronger marketing strategies and activities are associated with higher economic sustainability, which may reflect the importance of marketing in achieving long-term sustainability within the studied framework.

Corporate finance had a beta of 0.208, with a t-value of 1.967 and a p-value of 0.053, which is marginally significant at the 5% significance level. This indicates that corporate finance practices are positively associated with economic sustainability, though the significance level is borderline, requiring further exploration to confirm the strength and consistency of this relationship.

Lastly, the model's F-change value was 4.034, with a significance of 0.003. This indicates that the overall model is statistically significant and explains a meaningful portion of the variation in economic sustainability, suggesting that the combination of these predictors has a strong explanatory power for the dependent variable.

Therefore, though marketing and technology emerged as statistically significant predictors of economic sustainability, other factors such as corporate governance system, human resource capacity and corporate finance exhibited mixed or weak effects. This model calls attention to the importance of technology and marketing in influencing economic sustainability, whereas other factors may need further refinement or different specifications to better understand their impacts. An inspection of the Beta and p-values reveals that of the five hypotheses set out, three were accepted, whereas the other two were rejected, as shown in



Table 9, overall the results suggest that technology and marketing support the economic sustainability of state-owned enterprises in Zambia.

Table 9: Null Hypotheses Testing

Hypotheses	Null Hypothesis	P-Value vs Sig Level	Conclusion
H1	Corporate governance does not support the economic sustainability of SOEs	0.261>0.05	Accepted
H2	Technology does not support economic sustainability.	0.004<0.05	Rejected
H3	Marketing does not support economic sustainability	0.032<0.05	Rejected
H4	Corporate finance does not support economic sustainability	0.053>0.05	Accepted
H5	Human resource capacity does not support economic sustainability	0.912>0.05	Accepted

Source: Authors' work

6.4. Challenges associated with the attainment of economic sustainability of SOEs

An assessment of challenges militating against the attainment of SOEs revealed that economic instability, market competition, unfavorable Government policy, poor management, as lack of funding are the main issues hindering the economic sustainability of SOEs, as denoted by the mean scores ranging from 3.93 to 4.27, as shown in Table 10.

Table 10: Challenges to attaining economic sustainability of SOEs

	N	Minimum	Maximum	Mean	Std. Deviation
To no extent (≥1.00 and ≤1.80)					
To some extent (≥1.81 and ≤2.60)					
Moderate extent (≥2.61 and ≤3.40)					
Large extent (≥3.41 and ≤4.20)					
Very large extent (≥4.21 and ≤5.00)					
Economic Instability	88	1	5	4.27	0.448
Market Competition	88	1	5	4.14	0.377
Unfavorable Government Policy	88	1	5	4.08	0.346
Poor Management	88	1	5	3.94	0.382
Lack of Funding	88	1	5	3.93	0.498
Inadequate Employee Skills	88	1	5	3.02	0.727

(Source: Authors' research)



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The challenge of inadequate employee skills recorded a mean score of 3.02, implying moderate influence. Likewise, an inspection of the standard deviation scores yielded values of less than 1. Overall, the results suggest that economic instability, market competition, unfavorable Government policy, poor management, lack of funding and inadequate employee skills negatively affect SOEs attainment of economic sustainability.

7. Results

7.1. Factors supporting the economic sustainability of state-owned enterprises

The results revealed that corporate governance systems had no significant effect on the economic sustainability of state-owned enterprises in Zambia as indicated by the p-value of 0.261. These results contradict the literature, for instance, Chiputa (2020) argues that SOEs which have sound corporate governance systems have proven to be economically sustainable. A viewpoint shared by Mumba and Kazonga (2021) that good corporate governance is a key factor in ensuring high returns on investments in SOEs. Further inspection of the factor analysis revealed that all the postulated measurement items had factor loadings of above 0.5, implying that they adequately define the construct of corporate governance systems.

With regards to human resource capacity, which recorded a p-value of 0.912, denoting a non-significant effect of the economic sustainability of SOEs. This result contradicts the literature evidence, which argues that human resources is significant in attaining economic sustainability, positing that the presence of adequate and motivated staff is a catalyst to attaining economic sustainability. More so, it is important for SOEs to invest in continuous professional development of staff, strategic hiring, as well as ensuring employee motivation (Mbo, 2017; Siwale, et al., 2020; Seran, 2022). Similarly, the variable corporate finance yielded a non-significant relation, having recorded a p-value of 0.053, which was slightly above the minimum threshold. Further inspection of the factor analysis revealed that all the postulated measurement items had factor loadings of above 0.5, implying that they adequately define the construct human resource capacity.

Marketing as a construct contributed significantly to the economic sustainability of SOEs, as denoted by a Beta =.222 and p-value of 0.032. Equally an inspection of factor loads for all the measured items revealed scores of not less than the minimum required 0.5, meaning that in ensuring SOEs sustainability marketing is explained by Branding, responding to Customer needs, Quality products, having a Variety of products, use of Social media, as well as product promotions through campaigns these assertions are shared by other scholars (Bwalya, 2019, Lopez, 2020, Lee and Kim, 2020, Zavattaro, 2021).

On the contrary, the variable technology with a beta of -0.296 and p-value of 0.004, indicated a statistically significant negative relationship between technology and economic sustainability of SOEs. As aforementioned, this warrants further investigation considering that other scholars advance that companies that are at pace with new technology not only stand amidst stiff competition but they also meet the needs of their customers and ultimately become economically sustainable (Gilchrist, 2016). Adoption of technologies such as the use of the internet, cloud computing and artificial intelligence has been cited to contribute to improved delivery of products and service delivery (Carvalho, 2020). Overall, the finding agrees with (Chiputa, 2020; Mumba and Kazonga, 2021; Bwalya, 2019; Anwar and Abdullah 2021; Lopez,



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2020; Marimuthu, 2020) who argue that the use of technologies as well as competitive marketing strategy has an effect on the economic sustainability of SOEs.

7.2. Challenges associated with the attainment of economic sustainability of SOEs

The descriptive analysis on the challenges indicated that lack of funding, unfavourable market competition as well as economic instability are the main challenges SOEs are experiencing. With a mean score of 3.93, lack of funding was suggested as having a significant effect on the economic sustainability of SOEs, the findings agree with Zhou et al. (2023) and Tanwer and Garg (2024) assertion that lack of funding as well as diverting of funding, affects the economic sustainability of SOEs. With regard to inadequate employee skill, a mean score of 3.02 suggested a moderate effect on the sustainability of state-owned enterprises; this aligns with Ibrahim (2018), Limbo (2019) and Ambe et al. (2023) who underscored the need for capacitating SOEs with skilled human resources. Moreover that in order to attract a highly skilled workforce, there is a need to introduce competitive remuneration and incentives.

Unfavourable government policies scored a mean of 4.08, implying a high effect on the economic sustainability of SOEs, the finding agrees with Baulbuena (2014), who pointed out that state-owned enterprises in sub-Saharan Africa are subject to multiple and often competing objectives and political interference in the operation of companies. Adding that such political environments have brought about unfavourable policies, which eventually have had a negative effect on the operations of enterprises. Furthermore, on poor management, which had a mean score of 3.94, denoting a significant effect on SOEs' sustainability, a similar study by Arkhipova et al. (2017) argues that, in Africa, the absence of effective management is at the centre of the failure of SOEs to fulfil the mandate for which they were created.

8. Conclusion and recommendations

This study underscores the need for state-owned enterprises to be economically sustainable and independent if they are to remain relevant and contribute to the provision of essential goods and services. Using Zambia as a case study in sub-Saharan Africa, this research establishes and posits that the economic sustainability of state-owned enterprises depends on technology and marketing. The paper, therefore, recommends the need for governments in developing countries to be deliberate and develop policies aimed at promoting partnerships with the private sector in areas of technology, as well as embrace the use of competitive marketing strategy. Though interesting and valuable findings have emerged from this study, they are not without limitations. A study considering the influence of other factors, such as those related to culture, is recommended.

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