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Financial Projections and Risk Analysis in the Oil Distribution Sector: A Case Study of a Family-Owned Enterprise in Nairobi, Kenya

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Abstract

This study examines a small family-owned oil distribution enterprise in Nairobi, Kenya, focusing on avoiding startup failure, enhancing long-term sustainability, and evaluating financial performance through governance and risk assessment over five audited fiscal years (FY 2020–2024). The study employs ratio analysis, Altman Z'-Score distress prediction, and Discounted Cash Flow (DCF) valuation within a single-case embedded research design. Findings indicate consistent improvement in profitability and liquidity, with the firm predominantly classified within the Safe Zone. However, deficiencies in financial governance—including inadequate documentation of shareholder transactions, absence of formal equity reconciliation, informal receivables management, and limited risk disclosure—represent material vulnerabilities to long-term sustainability. The study proposes an integrated governance and risk management framework to strengthen financial control, operational resilience, and long-term growth in small and medium-sized enterprises (SMEs).

Keywords
Family-owned SME, Oil distribution, Financial performance, Corporate governance, Risk assessment

1. Introduction
Small family-owned enterprises in the oil distribution sector play a vital role in emerging market economies, yet remain acutely vulnerable to startup failure due to financial instability, weak risk management, and inadequate governance (Astrachan and Shanker 2003; Carney 2005). These challenges are amplified by crude oil price volatility, supply chain disruptions, geopolitical tensions, and regulatory shifts (Hamilton 2009; Baumeister and Kilian 2016). This research examines a Nairobi-based petroleum distribution company through a five-year longitudinal case study (FY 2020–2024), integrating financial projections, risk analysis, and governance assessment to produce practical guidance for similar enterprises. The company's identity is anonymized for commercial confidentiality, with the thesis supervisor retaining access to the original data.

Small family-owned oil distribution companies consistently face volatile market prices, geopolitical instability, and operational risks threatening financial stability. Many lack frameworks to adequately forecast performance, manage risk, and implement suitable governance, leaving strategic decision-making undermined and the business exposed to unnecessary failure risk. This research addresses the critical need to integrate financial projection techniques, risk analysis, and governance frameworks into a practical, structured approach for such enterprises.

1.1 Objectives
The following research objectives guide this study:

O1: To evaluate the historical financial performance and health of the company through analysis of its five-year financial statements.
O2: To identify and assess the major financial and operational risks and their impact on business continuity and sustainability.
O3: To estimate the intrinsic value of the company and project future performance using forecasting and scenario modeling.
O4: To propose a structured governance framework aimed at reducing startup failure risks and ensuring long-term sustainability.
O5: To recommend risk management strategies specially designed to mitigate identified financial risks.

2. Literature Review

Financial analysis in the oil and gas sector employs ratio analysis, trend forecasting, scenario modeling, and intrinsic valuation. Damodaran (2012) demonstrated that traditional liquidity ratios may mislead in commodity-intensive businesses, recommending supplementary analyses of inventory turnover and the cash conversion cycle. Baumeister and Kilian (2016) concluded that no single forecasting approach consistently outperforms others and advocated for scenario-based modeling. Cortazar and Schwartz (2003) demonstrated how stochastic modeling can be integrated with operational constraints to produce realistic financial projections for oil distribution. Discounted Cash Flow analysis remains the primary intrinsic valuation method, though it requires careful calibration of the WACC to account for commodity price volatility (Damodaran 2012; Brealey et al. 2020). Rodionov et al. (2023) further reinforced the utility of scenario-based tools in oil and gas financial forecasting, particularly for SMEs with limited planning infrastructure. Family businesses represent 70–90% of all private enterprises and generate over 60% of GDP in most economies (Astrachan and Shanker 2003). Jensen and Meckling (1976) established that owner-managed firms face fewer principal-agent conflicts, yet Schulze et al. (2001) demonstrated that altruism-related costs—including informal decision-making and underinvestment in governance—can be equally damaging. Carney (2005) described how concentrated family ownership creates both competitive strengths and governance vulnerabilities by undermining independent oversight. Fama and Jensen (1983) further examined the implications of the separation of ownership and control in closely held firms, findings directly applicable to single-shareholder petroleum distributors. Chrisman et al. (2004) identified the absence of formal governance mechanisms as the principal driver of failure in family-controlled businesses in volatile sectors.

Klapper and Love (2004) established that governance quality is the primary determinant of SME access to external financing, with transparent financial reporting being the most important governance characteristic. Miller and Le Breton-Miller (2006) demonstrated that formalized family governance produces superior long-term performance outcomes. Oil distribution companies specifically face fuel price volatility, supply chain disruptions, geopolitical instability, and operational hazards requiring structured risk frameworks (Hull 2015; Yergin 2006). The Altman Z'-Score—validated for listed firms (Altman 1968), private companies (Altman 1983), and SMEs (Altman et al. 2022)—provides the primary validated financial distress metric applied in this study. Prior research demonstrates a significant gap in empirical studies of these issues for small petroleum distribution companies in Sub-Saharan Africa, which this paper directly addresses.

3. Methods

This study adopts a pragmatic, abductive research approach operationalized through a mixed-methods, single-case embedded design following Yin (2018). The case methodology is justified by the need for contextual depth in examining a single firm's governance and financial performance across five fiscal years. The research integrates quantitative financial analysis with qualitative governance assessment to produce a holistic evaluation.

Four analytical techniques are applied: (1) comprehensive ratio analysis across profitability, liquidity, efficiency, leverage, and financial distress categories, benchmarked against Brigham and Houston (2021) and Damodaran (2012); (2) five-year Compound Annual Growth Rate (CAGR) trend analysis; (3) Altman Z'-Score computation using the formula $Z' = 0.717X_1 + 0.847X_2 + 3.107X_3 + 0.420X_4 + 0.998X_5$, with Safe Zone ($Z' \geq 2.9$), Grey Zone ($1.23 \leq Z' < 2.9$), and Distress Zone ($Z' < 1.23$) classifications (Altman 1983; Altman et al. 2022); and (4) DCF-based intrinsic valuation across three scenarios. All computations were performed using a purpose-built Microsoft Excel model. Governance analysis follows the IFRS for SMEs framework (IASB 2015), specifically Sections 6 and 33, supplemented by best-practice standards from Klapper and Love (2004) and Hull (2015).

4. Data Collection

Primary data comprises two bound audited financial reports: (1) Report and Financial Statements for the Year Ended 31 December 2022, providing comparative data for FY 2020–2022; and (2) Report and Financial Statements for the Year Ended 31 December 2024, covering FY 2023–2024. Both reports were prepared by an independent CPA firm in Nairobi in accordance with IFRS for SMEs (IASB 2015) and the Kenyan Companies Act, carrying unqualified audit opinions for all five years. Secondary sources are restricted to Q1-ranked journals, as per the Scimago Journal Rankings, to ensure methodological rigor.

The case company is a private limited company incorporated under the Kenyan Companies Act (Cap. 486), engaged in wholesale and retail petroleum distribution in Nairobi and across selected African countries since 2020. Operating under a single director-shareholder with Ecobank as its principal banker, it has carried zero bank borrowings across all five fiscal years and has declared no dividends, retaining all earnings consistent with a family firm continuity orientation (Miller and Le Breton-Miller 2006). Data on all five fiscal years (FY 2020–2024) were extracted directly from audited statements and verified against prior-year comparative figures to ensure consistency.

5. Results and Discussion

5.1 Numerical Results

Table 1 presents the summarized income statement for FY 2020–2024. Revenue grew at a five-year CAGR of 0.7%, recovering from a 12.6% decline in 2021 to reach USD 20.02 million in 2024. Net profit margin advanced from 15.8% in 2020 to 30.9% in 2024, driven by a reduction in the cost of goods sold from 68.2% to 52.7% of revenue. The 2023 anomaly reflects elevated procurement costs rather than structural deterioration.

Table 1. Summary statement of comprehensive income — FY 2020–2024 (USD, exact as audited)

Item (USD)	2020	2021	2022	2023	2024
Revenue	19,465,920	17,020,980	20,990,213	18,265,103	20,020,947
Cost of Goods Sold	13,279,374	10,446,604	12,367,210	13,018,587	10,546,600
Gross Profit	6,186,546	6,574,376	8,623,003	5,246,516	9,474,347
Gross Profit Margin	31.8%	38.6%	41.1%	28.7%	47.3%
Total Operating Expenses	2,435,549	2,221,500	2,197,012	2,324,056	1,919,470
Net Profit Before Tax	3,750,997	4,352,876	6,425,991	2,922,460	7,554,877
Profit After Tax (PAT)	3,075,818	3,569,359	5,269,312	2,396,417	6,194,999
Net Profit Margin	15.8%	21.0%	25.1%	13.1%	30.9%

Table 2 presents the statement of financial position. The company operated with zero bank debt throughout all five years. The shareholders' contribution—classified as a non-current liability—fluctuated between USD 1.85 million and USD 12.86 million annually without formal documentation, repayment terms, or interest rate disclosure, constituting the most critical governance deficiency identified (IFRS for SMEs Section 33 breach).

Table 2. Statement of financial position — FY 2020–2024 (USD, exact as audited)

Item (USD)	2020	2021	2022	2023	2024
PPE Net Book Value	394,409	471,353	568,510	536,879	449,913
Inventories	5,052,233	4,458,960	7,296,210	5,150,230	4,458,960
Trade Receivables	4,360,400	3,970,500	2,639,431	4,371,400	3,270,500
Cash at Bank & Hand	6,376,234	743,025	2,397,103	6,076,334	1,638,025
TOTAL ASSETS	16,183,276	9,643,838	12,901,254	16,134,843	9,817,398
Total Current Liabilities	925,200	1,094,418	1,528,690	776,064	1,670,778

Shareholders' Contribution	11,731,771	4,880,061	6,003,252	12,862,362	1,851,621
Total Equity	3,526,305	3,669,359	5,369,312	2,496,417	6,294,999

Table 3 presents the comprehensive ratio analysis benchmarked against the Brigham and Houston (2021) benchmark. The current ratio exceeded 1.5 in all years (range: 5.61–20.09), confirming genuine liquidity from the debt-free structure. Gross profit margin advanced from 31.8% to 47.3%, substantially exceeding the 5–10% benchmark for emerging market petroleum distribution. The Altman Z'-Score confirmed Safe Zone status in four of five years; the 2023 Grey Zone result (2.92) reflects the temporary combination of reduced profitability and elevated shareholders' contributions.

Table 3. Financial ratio analysis — FY 2020–2024 (benchmarks: Brigham and Houston 2021)

Ratio	Benchmark	2020	2021	2022	2023	2024
Gross Profit Margin	≥ 20%	31.8%	38.6%	41.1%	28.7%	47.3%
Net Profit Margin	≥ 5%	15.8%	21.0%	25.1%	13.1%	30.9%
Return on Equity	—	87.2%	97.3%	98.1%	96.0%	98.4%
Return on Assets	—	19.0%	37.0%	40.8%	14.8%	63.1%
Current Ratio	≥ 1.5	17.07	8.38	8.07	20.09	5.61
Quick Ratio	≥ 1.0	11.60	4.31	3.30	13.46	2.94
Debt-to-Equity	< 2.0	3.59	1.63	1.40	5.46	0.56
Asset Turnover	≥ 1.0×	1.20×	1.77×	1.63×	1.13×	2.04×
Receivable Days	< 45d	81.8d	85.2d	45.9d	87.3d	59.6d
Z'-Score	≥ 2.9	3.10	4.11	4.92	2.92	6.43
Zone	Safe	SAFE	SAFE	SAFE	GREY	SAFE

Table 4 presents the DCF intrinsic valuation under three scenarios. The base-case enterprise value of approximately USD 18.2 million—nearly double total assets of USD 9.82 million at end-2024—suggests meaningful intangible value creation through established distribution relationships and operational track record (Damodaran 2012). The wide conservative-to-optimistic range (USD 9.8M–USD 29.4M) reinforces the importance of formal scenario-based financial planning (Rodionov et al. 2023).

Table 4. DCF intrinsic valuation — three-scenario summary (base year: FY 2024)

Assumption	Base Case	Optimistic	Conservative	Unit
Revenue Growth (Yrs 1–5)	2.0%	5.0%	0.0%	% p.a.
Operating Profit Margin	25.0%	30.0%	18.0%	%
Discount Rate (WACC)	15.0%	12.0%	18.0%	%
Terminal Growth Rate	3.0%	3.5%	2.0%	%
Estimated Business Value	~$18.2M	~$29.4M	~$9.8M	USD Millions

5.2 Graphical Results

Figure 1 illustrates revenue and profit after tax trends for FY 2020–2024. The visualization confirms the non-linear revenue pattern and the sustained upward trajectory of net profit despite the 2023 anomaly. The divergence between revenue and profit lines reflects improving cost management efficiency, particularly in cost of goods sold.

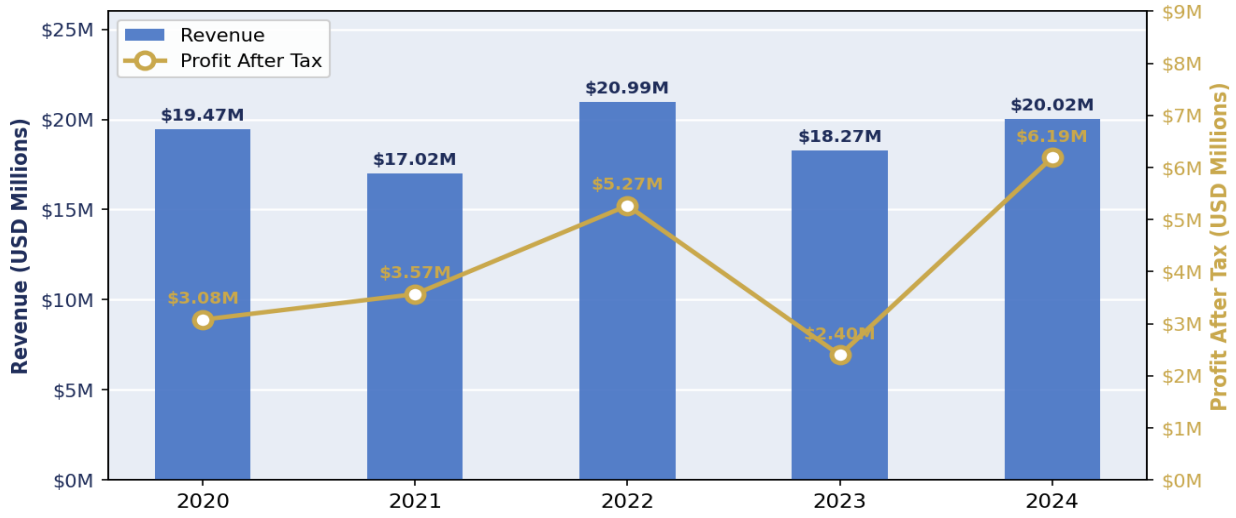

Figure 1. Revenue and profit after tax trends, FY 2020–2024

Figure 2 plots the Altman Z'-Score trajectory with distress zone demarcations across FY 2020–2024. The chart visually demonstrates the company's predominantly Safe Zone classification, with the 2023 dip to the Grey Zone boundary providing a clear warning signal. The sharp recovery to 6.43 in 2024 illustrates the Z'-Score's sensitivity to simultaneous improvements in profitability and reductions in shareholders' contributions.

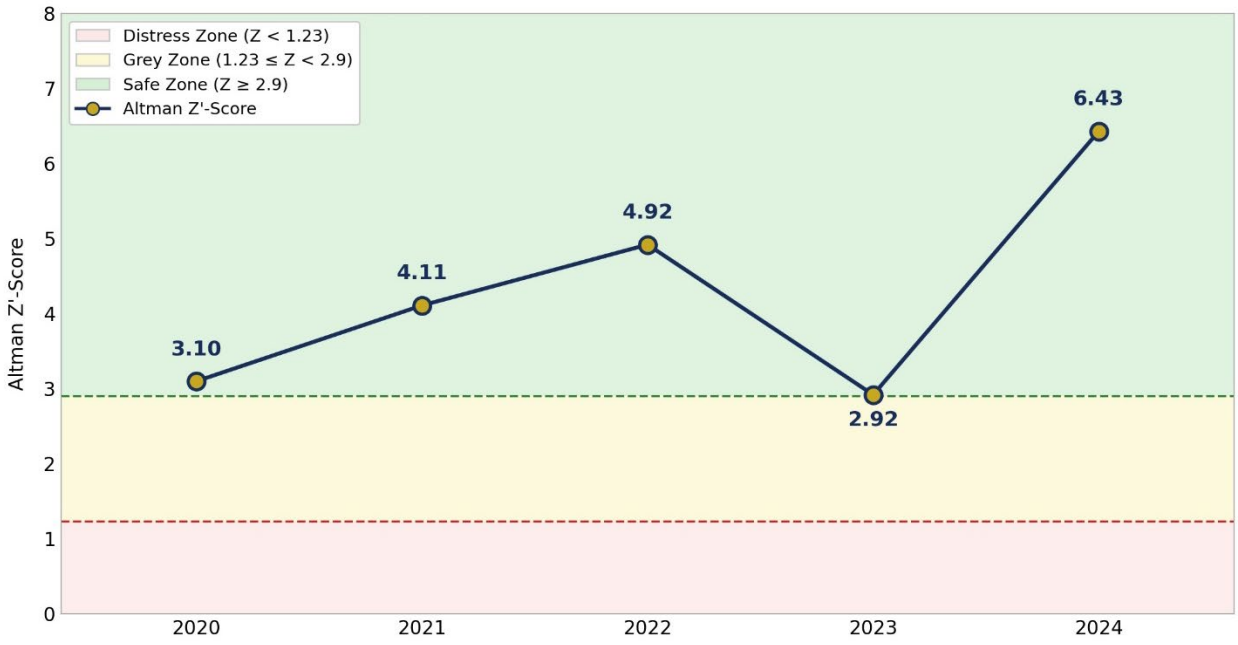

Figure 2. Altman Z'-Score trajectory with distress zone boundaries, FY 2020–2024

5.3 Proposed Improvements

Four governance deficiencies were consistently identified across all five audited years, each directly evidenced in the financial statements and posing a specific threat to the company's ability to grow, obtain financing, or withstand market shocks.

D1 — Undocumented Shareholders' Contributions (IFRS Section 33): The owner transferred large sums in and out of the company—recorded as a "shareholders' contribution"—with no formal repayment terms, interest rate, or legal

agreement. Amounts fluctuated from USD 1.85 million to USD 12.86 million with no explanation, in violation of IFRS for SMEs Section 33 and effectively blocking access to external financing (Klapper and Love 2004).
D2 — Missing Statement of Changes in Equity (IFRS Section 6): This mandatory report was absent from all five annual reports. Without it, there is no official audit trail of how owner funds and earnings moved through the business, making year-on-year comparisons unreliable and signaling weak internal financial controls to external reviewers.
D3 — No Receivables Aging Schedule: Customers paid late in 4 of 5 years, with receivables days peaking at 87 days, exceeding the 45-day industry standard. The absence of a formal aging report or credit policy represents a hidden liquidity risk that can create cash shortfalls when late payments coincide with cost shocks—a common scenario in oil distribution (Hull 2015).

D4 — Risks Described Qualitatively Only: Audited statements mention operational and market risks in general terms but provide no quantitative estimates or risk ownership assignments. Without a formal risk register, the company cannot systematically prepare for fuel price spikes, regulatory changes, or supply disruptions (Hull 2015; Chrisman et al. 2004).

Based on these findings, four improvements are proposed. Recommendation 1 is to establish a formal governance framework, adopting a written Corporate Governance Policy documenting director roles, related-party transaction rules, and formal terms for the shareholders' contribution, achieving IFRS for SMEs Section 33 compliance. Recommendation 2 is to implement a credit and working capital management policy, introducing a debtor aging report, formal credit terms, and collection procedures to reduce receivable days to the 45-day benchmark. Recommendation 3 is to introduce quarterly financial monitoring and annual scenario planning, preparing quarterly ratio dashboards and annual DCF valuations with three scenarios to provide early-warning capability. Recommendation 4 is to develop and maintain a structured risk register that identifies key financial, operational, and market risks, assigns owners, and documents controls, reviewed biannually (Figure 3).

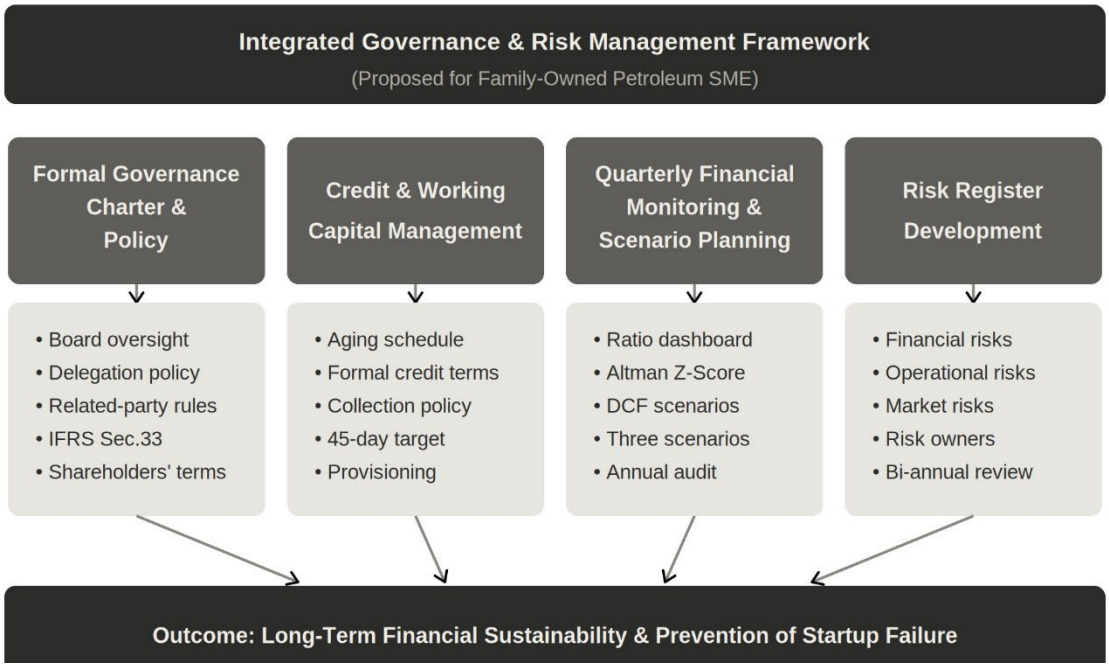

Figure 3. Proposed integrated governance and risk management framework

5.4 Validation

The four research hypotheses are validated against empirical findings as follows. H1 (strong liquidity from debt-free structure) is fully supported: the current ratio exceeded 1.5 in all years (range: 5.61–20.09) and the quick ratio exceeded 1.0 throughout, confirming genuine liquidity. H2 (progressive profitability improvement) is supported: gross profit margin advanced from 31.8% to 47.3% and net profit margin from 15.8% to 30.9%, both substantially exceeding emerging-market petroleum distribution benchmarks. H3 (low immediate distress risk but governance threats) is

substantially supported: the Altman Z'-Score confirmed Safe Zone status in four of five years; the 2023 Grey Zone result (Z' = 2.92) illustrates how quickly safety margins narrow when governance weaknesses and external shocks combine. H4 (absence of formal governance as the primary risk factor) is strongly supported: four IFRS for SMEs compliance gaps—absent Statement of Changes in Equity (Section 6), undisclosed shareholders' contributions (Section 33), no receivables aging schedule, and qualitative-only risk disclosures—create the capital structure opacity that Klapper and Love (2004) identify as the primary barrier to SME external financing.

The findings are consistent with Carney's (2005) characterization of family firms, in which concentrated ownership enables operational effectiveness but creates governance risks through the absence of independent oversight. The undocumented shareholders' contribution mechanism creates three serious problems: a breach of IFRS Section 33, a planning risk from unpredictable funding flows, and a growth constraint. The wide DCF valuation range (USD 9.8M–USD 29.4M) underscores the importance of formal, scenario-based financial planning, as advocated by Rodionov et al. (2023) and Baumeister and Kilian (2016).

6. Conclusion

This research demonstrates that a small, family-owned petroleum distribution company in Kenya can achieve exceptional financial results over five years while carrying governance weaknesses that threaten long-term sustainability. Strong profitability, exceptional liquidity, and a base-case intrinsic value of USD 18.2 million are tempered by four material IFRS governance deficiencies and an informal capital structure that creates information asymmetry and limits future financing opportunities.

All five research objectives are addressed. O1 is fulfilled through a comprehensive five-year ratio analysis and Altman Z'-Score computation confirming Safe Zone status in four of five years. O2 is fulfilled by identifying four documented governance deficiencies that create specific sustainability threats. O3 is fulfilled through DCF valuation across three scenarios, yielding a base-case value of USD 18.2 million. O4 and O5 are fulfilled through four concrete governance and risk management recommendations, synthesized in the proposed integrated framework.

The primary contribution of this paper is to demonstrate how financial analysis, governance assessment, and risk management can be combined practically for small, family-owned petroleum businesses in emerging markets—a combination largely absent from the existing literature. Future research should extend this to comparative multi-firm studies across East Africa to enable broader conclusions about the governance-performance relationship in this sector.

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Aminu Ahmad Aminu is a Master's student in Engineering Management and Technology at the Islamic University of Madinah, Saudi Arabia, with a professional background in civil engineering. His research focuses on construction management, structural engineering, and the application of advanced statistical methodologies—including Path Analysis and Structural Equation Modeling (SEM)—to evaluate and solve complex project management challenges.. As a Civil Engineer, his work aims to bridge the gap between theoretical causal modeling and practical infrastructure delivery within the dynamic construction sector.