

Financing Structures and Capital Access Challenges for National Carriers in East Africa: The Case of Air Tanzania and Precision Air

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Air transport plays a critical role in a global economic development through trade facilitation, tourism, regional integration, and connectivity to global markets. East African's national carriers are often considered as strategic instruments for achieving these objectives, for example in Tanzania airline industry contributes to USD 3.8 billion to the national GDP while supporting 711,000 employments, making it one of the most impactful sectors (African Pilot Magazine, 2025). Chevallier et al. (2025) state that despite the important roles that airlines play, many East African airlines are under increasing financial strain due to the COVID-19 pandemic, fluctuating demand, high operating costs that endanger many airlines' survival, and stringent regulations that require significant investments to meet compliance standards. These constraints prompt considerable pressures on financing structures and the ability to access sustainable capital to maintain operational performance (Chevallier & Picart, 2025).

The airline industry is well known for being capital intensive that requires acquisition of long-term investment such as aircraft acquisition, maintenance, training, and other supporting infrastructure (Capobianco, 2004). According to Ashworth (2025) many airlines in developed markets have access to diversified financing sources such as equity, debt aircraft leasing, and export credit support. Contrary to developed markets, most airlines in emerging and developing economies like East African airlines operate within financially constrained markets which include high borrowing cost, limited long-term credit, weak financial institutional framework, and elevated country risk premiums (Makubo, 2015). Further studies have noted that post-COVID, the macroeconomic instability was evident mostly inflation pressures and tough monetary policy has significantly increased financing costs in emerging economies, these conditions have further intensified operational and financial challenges faced by firms and strategic sectors, (Aguir, A., 2025).

According to CAG financial report of the year 2024, Air Tanzania being a state-owned airline which relies totally on government support, has recorded a significant losses amounting to TZS 91.8 billion for the fiscal year 2023/2024, largely contributed by the grounded Airbus fleet (A220-300) due to maintenance issues and high operational costs, including aircraft lease payments to the Tanzania Government Flight Agency, have been a persistent issue for Air Tanzania. On the other hand, Precision Air is the only Tanzanian publicly listed airline, its equity ownership is shared amongst institutional and individual investors, following its initial public offering on the Dar es Salaam Stock Exchange in 2012. The largest shareholder was Michael N. Shirima, holding about 42.91% of shares, Kenya Airways, which owns roughly 41.23%. An employee share scheme holds about 1.10%, while the remaining 14.76% of shares are owned by other public shareholders.

Together these investors constitute the airline's capital base, (Precision Air Services Plc, 2018). Despite of growing revenues, recurring losses and high liabilities which have resulted into negative shareholder's equity, reflecting ongoing financial restructuring efforts and operational challenges Sauti Kubwa (2021). Precision Air recorded a significant loss of Sh30.8 billion in its annual financial results for the year ending March 31, 2013, mainly contributed by increased operating and maintenance costs that outpaced revenue growth (The Citizen, 2013).

Despite of huge scholarly interest in airline financing structures, empirical research focusing East African airlines inadequately addressed. Since the existing studies primarily focus on large global carriers and airlines operating in developed markets, leaving a significant gap in understanding how financing decisions affect financial sustainability in emerging and high-risk aviation environments like East Africa. Using the same experience from Air Tanzania Company Limited and Precision Air, this study examines how airline financing structures influence capital access and financial sustainability for these airlines. Therefore, this study contributes by analyzing how differing financing structures can affect capital access and sustainability in the post-COVID regional aviation environment.

Literature Review

Airline operations is well-known as a capital intensive which requires massive investment to acquire new aircraft, maintenance facilities, expand their route networks, and improve their services (Capobianco, 2004), as a result, many airlines rely on diverse financing sources including debt, equity, government support, and leasing arrangements to maintain market competitiveness (Geelen et al., 2022), Therefore the airline capital financing plays an important role in the global aviation industry, (StudyCorgi, 2023). According to IATA (2022), airline financing structure provides for airlines financial resilience, operational stability, and long-term sustainability in the aviation industry.

Therefore, understanding how these financing options influence capital access and operational performance is becoming increasingly important, particularly in high-risk industries like aviation. This literature review integrates theoretical, empirical, and conceptual perspectives to examine how airline financing structures work, while focusing on how they affect capital access and financial sustainability, with particular attention to the under-researched context of East African airlines in the post-COVID aviation environment.

From theoretical perspective, several corporate finance theories explain financing decisions in the aviation sector. Capital Structure Theory, developed by Franco Modigliani and Merton Miller in 1958, which argues that under perfect market conditions a firm's value is independent of its financing choices. However, in real world conditions such as taxes, bankruptcy risk, and market imperfections led to the development of the Trade-Off Theory popularized by Alan Kraus and Robert Litzenberger in 1973 which explains how firms balance the tax advantages of debt against the potential costs of financial distress. Similarly, in the airline industry, where operations are capital intensive and revenues are highly cyclical, achieving this balance is particularly challenging.

This study has also takes into account of the Pecking Order Theory, proposed by Stewart C. Myers and Nicholas Majluf in 1984, which explains the firm preference on internal financing before debts, while equity issuance is typically a last resort due to concerns over information asymmetry and ownership dilution. In East Africa, financing patterns reflect these theoretical perspectives. Exemplified by Air Tanzania Company Limited which relies significantly on government funding and state-supported aircraft leases, and Precision Air on the other hand, depends largely on debt financing and export credit-backed leases. These financing structures demonstrate the challenges of achieving optimal capital structures for East African airlines.

Moreover, according to Alici (2025), empirical studies indicate that financing structures significantly affect airline performance and sustainability. Airlines with diversified arrangements with combined equity, long-term debt, leasing, and strategic partnerships tend to demonstrate greater financial resilience during downturns (Baker & Wurgler, 2002; Graham & Harvey, 2001). On the other hand, a balanced capital structures can help to maintain liquidity and access emergency funding during crises like COVID-19, whereas highly leveraged airline carriers face higher interest obligations and reduced financial flexibility, increasing bankruptcy risk (Doganis, 2019; IATA, 2021).

Furthermore, these dynamics are intensified by the limited traffic loads, high operating costs, regulations, and limited access to capital markets within East Africa, Therefore, airlines have no choice but to turn to government ownership and loans, and strategic alliances in their quest to acquire and operate their fleets (Button, 2017). For example, Air Tanzania relies on government grants and internal leasing but continues to make operational losses (Daily News, 2025), while Precision Air relies on debt and export credit-backed leases but suffers from negative equity, lease defaults, and high debt costs (The Citizen, 2025).

Moreover, institutional factors such as poor financial systems and regulatory inconsistencies also limit capital access (Tralac, 2019). These findings emphasize that financial sustainability in East African airlines is influenced not just by internal factors but also by external factors, thereby emphasizing the importance of financing structures in financial sustainability.

Conceptual literature review in this study, critically examines the key concepts, variables, and their interrelationships that underpin this research study, it also clarifies how the principal constructs are defined and how they interact within the overall research framework.

In the context of this study, the primary concepts include financing structures and capital access challenges faced by national airlines, particularly within the East African aviation sector. These concepts are analyzed to provide a deeper understanding of how various financial arrangements such as debt financing, equity financing, and liquidity management contribute to airline sustainability, growth, and operational performance. Therefore, the conceptual review of this study establishes the linkages between financing structures and financial outcomes, thereby informing the development of the study's analytical framework and supporting the interpretation of empirical findings.

Despite of being a capital intensive industry, airline financing structures involves combination of equity, debt, leasing, and government support used to finance airline's critical investments including acquisition, maintenance, and efficiency (Imanov et al., 2023). Thus, some airlines rely heavily on government grants and state-mediated leases, example Air Tanzania, the national and flag carrier of United Republic of Tanzania (The Citizen, 2025). Similary, private owned airlines such as Precision Air relies heavily on a combination of equity, debt, and export credit-backed leasing, highlighting the practical implications of financing decisions (The Citizen, 2025).

According to the study conducted by Kahle et al., (2013) financing structures refers a combination of an airline's ability to obtain internal and external financial resources to acquire assets such as aircrafts and managing operational complexities. In East African aviation context, capital access is often constrained by underdeveloped financial markets, high borrowing costs, and weak institutional frameworks, it is evident that Air Tanzania benefits from substantial government support, while Precision Air faces conditional and limited access to funding, which restricts fleet expansion and constrains operational growth (Tralac, 2019).

However, according to Sha'ari et al., (2023) study, financial sustainability is defined as the firm's ability to cover costs, service debt, and invest in growth, which are jointly influenced by financing structures and capital access. On the other hand, ownership type and institutional context further moderate this relationship, since government ownership ease funding consequently reduce efficiency, on the other hand private carriers face higher financial risks (Yahaya et al., 2025). Therefore, understanding these dynamics provides insight into the systemic financial challenges confronting East African airlines.

The conceptual framework used in this study is based on Trade-Off Theory and Pecking Order Theory as dominant frameworks which explain airlines' financing decisions towards sustainability. The Trade-Off Theory describes how airlines seek an optimal capital structure through balancing the benefits of debt against the costs of financial distress, ultimately affecting airline's profitability, liquidity, and risk (Jahanzeb et al., 2013). Likewise, the Pecking Order Theory explains the hierarchical financing preference, where airline's priority is internal funds, followed by debt and equity, shaping access to capital (Jahanzeb et al., 2013). Additionally, the conceptual framework has introduced the ownership structure and the institutional environment act as moderating variables, influencing financing behavior and outcomes. Accordingly, the framework explains both direct relationships and contextual variations in airline financial sustainability.

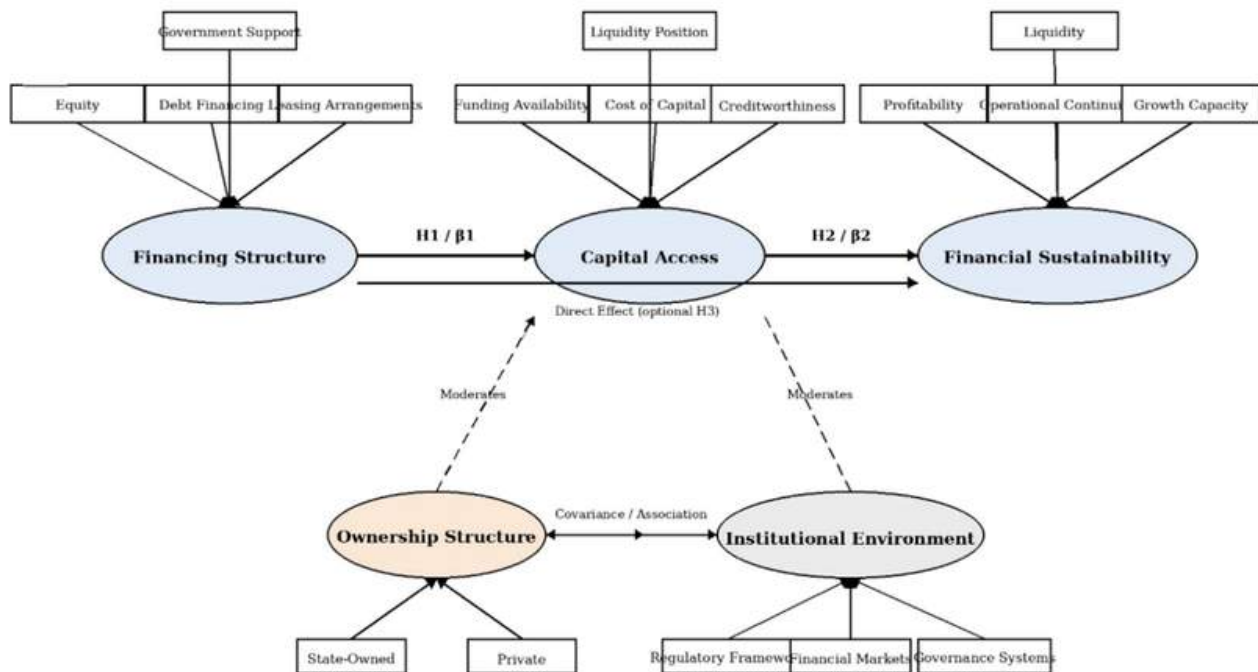


Figure 1. Conceptual Mapping of Airline Financing

The conceptual framework in Figure 1 above, illustrates the relationship between financing structures, capital access, and financial sustainability of national carriers in East Africa. Financing structure is presented as the primary independent variable which comprises of equity financing, debt and leasing arrangements, and government support. In the airline industry, these components determine how airlines mobilize financial resources to finance aircraft acquisition, maintenance, and operational activities. However, the appropriate financing structure enhances credibility with financiers, while an imbalanced structure including excessive reliance on debt or subsidies may increase financial risk and limit future funding opportunities.

Moreover, the capital access plays as a mediating variable between financing structure and financial sustainability. According to Gibson and Morrell (2005), capital access is the airline's ability to acquire affordable and adequate funds from internal and external sources. This implies that the financing structures directly influence capital access by shaping borrowing costs, funding availability, and creditworthiness.

Meanwhile, airlines obtain temporary relief on liquidity through government support consequently, it reduces access to private capital, likewise, high leverage may increase borrowing costs and restrict new financing.

Moreover, the conceptual framework diagram in Figure 1 above demonstrates that financial sustainability is the dependent variable that signifies the airline's ability to maintain its profitability, liquidity, operational continuity, and fleet expansion over the long term. However, according to Kumar et al., (2025) access to capital facilitate airlines to maintain operations, invest in fleet acquisition, and stay financially sustainable.

Conversely, the conceptual framework has noted ownership structure and the institutional environment as moderating variables in airline financing, which play a crucial role to moderate airline's financing structures. Whereby the ownership structure influences governance, risk perception, and investor confidence, while the institutional environment like regulatory, quality, financial market development, and legal frameworks affects financing conditions. Together, these factors shape how financing structures translate into capital access and ultimately impact the financial sustainability of national carriers.

Through the guidance of the conceptual framework and insights from the theoretical and conceptual literature reviews, this study formulates five (5) hypotheses to examine empirical relationships between financing structures, capital access, and financial sustainability of national carriers in East Africa.

- H₁: Financing structures (debt, equity, and government funding) significantly affect capital access.
- H₂: Capital access significantly affects financial sustainability.
- H₃: Financing structures significantly affect financial sustainability.

H₄: Capital access mediates the relationship between financing structures and financial sustainability.

H₅: Ownership structure and institutional environment moderate the relationship between financing structures and capital access.

Despite of the government initiatives to support East African airlines and external financing mechanisms to sustain operations, these interventions are not suitably addressing the structural constraints in capital access to ensure long-term financial viability. However, there are very few literature explaining the financing structure of airlines operating in financial constraints markets, while the existing literature emphasizes on operational efficiency and regulatory frameworks, with limited empirical evidence on the role of airline financing structures to influence capital accessibility and financial sustainability, particularly during the post-COVID, and high-risk macroeconomic environment.

Methodology

Research Design

This study utilizes a convergent parallel mixed-methods design which combines the quantitative financial analysis and qualitative inquiry to examine how financing structures influence capital access and financial sustainability of East African airlines. According to Creswell & Plano Clark, (2018), a convergent parallel mixed-methods design encompasses the simultaneous collection and separate analysis of quantitative and qualitative data, then results are integrated to determine whether the data analysis confirm, complement, or contradict each other. However, a mixed-method approach used in this study facilitates triangulation from multiple data sources and methodological approaches in order to enhance the validity, credibility and robustness of the findings.

Therefore, a case-based explanatory design focusing on East African operators particularly Air Tanzania and Precision Air is adopted to facilitate an in-depth analysis of systemic financing challenges, due to their differing ownership structures and financing models.

This study adopts a convergent parallel mixed-method integration approach to combine quantitative financial analysis with qualitative interview findings. According to Wasti (2024), the purpose of this integration is to provide a comprehensive understanding of how financing structures influence financial sustainability of East African airlines particularly Air Tanzania and Precision Air. Quantitative results identified statistical relationships between financing variables and profitability, while qualitative findings provided contextual explanations for those relationships. Furthermore, triangulation was used to integrate the results, whereby the quantitative and qualitative findings were compared to determine whether they converge, complement, or explain each other.

Data Sources

The qualitative data which serves as primary data were collected from semi-structured interviews with airline finance managers, government officials involved in aviation financing, and relevant industry stakeholders to provide necessary insights on financing decision making processes, barriers to private capital access, and the role of financial policy and institutional frameworks.

Quantitative data used in this study are referred to secondary data obtained from audited financial statements (FY2020 – FY2024), annual reports, regulatory filings, government publications, and aviation industry reports. Key financial indicators are extracted from multiple years to prepare trend analysis and comparison before and after major financing events, such as government equity injections, acquisition of new aircraft through leasing, or long-term loan arrangements.

Measurement of Variables

In order to capture the complex and multifaceted nature of airline financing structures and their impact on financial sustainability, key financial variables derived from the conceptual perspective in this study are measured using a combination of quantitative indicators and qualitative evidence.

Furthermore, in this study airline's financing structures are measured by examining the composition and available sources of airline funding whereby, the quantitative indicators such as debt levels which include total liabilities and debt-to-equity ratios. The equity injections which include share capital and retained earnings. The aircraft leasing arrangements which include operating and finance lease obligations, and the government financial support which consists of grants, capital injections, and state-backed guarantees. All of these indicators are derived from audited financial statements for fiscal years 2020 up to 2024, and official reports which provide for the information on airline financing.

Moreover, capital access in this study is measured through availability funds to support airline's operations such as borrowing costs which include interest expense and rates, access to private capital, and guarantees from government.

Likewise, financial sustainability from the conceptual perspective is measured using key financial indicators, such as profitability which involves operating and net profit margins, liquidity which include current and quick ratios, and debt-servicing capacity which include interest coverage and debt service coverage ratios.

Conversely, Ownership structure as a moderating factor identified in this study is measured as a categorical variable distinguishing state-owned and privately owned airlines. However, the institutional environment in this study is assessed through regulatory quality, financial market development, and policy frameworks.

Since, these factors act as moderators hence they have a direct influence on the relationship between financing structures, capital access, and financial sustainability.

Data Collection Method and Procedure

Subsequently, this study employs a convergent parallel mixed-methods design, which involves primary and secondary data to ensure a non-biased analysis. The airlines' audited financial statements provided a great source of secondary data which form a baseline for quantitative measures of financial performance particularly the capital structure, including variables such as total liabilities, equity, interest expense, and profitability indicators. The secondary data were systematically collected, verified to and consistently organized for regression analysis using Microsoft Excel.

Furthermore, primary data used in this study were collected from semi-structured interviews with various stakeholders including finance manager, government officials etc. based on the guidelines established using the findings obtained from secondary data analysis to ensure alignment with the study objectives to ensure in-depth insights of financing decisions in airline business, capital access, and operational challenges that could not be evident from financial statements alone.

Moreover, the data collection procedure was sequentially performed. Initial stage involved, secondary data were gathered from financial for the year ending 2020 up to year ending 2024, and were analyzed to inform the design of the interview questions. This was followed by the qualitative phase, where interviews were conducted with prior consent from the respondents, interview results were recorded, and transcribed precisely. Then transcripts were then reviewed and organized for thematic analysis using NVivo software. All data were handled with high confidentiality and stored securely. Participation into this study was voluntary and all information collected was for academic purposes and not otherwise, while maintaining ethical considerations throughout the process.

Data Analysis Techniques

Quantitative data are analyzed using financial ratio analysis, including profitability, liquidity, and leverage ratios. Likewise, the before-and-after comparison has been conducted to assess the changes in financial performance following major financing events such as debt-related events, equity-related events, interest expense and financing cost events, leasing and asset financing events as well as government or institutional interventions. This study uses inferential techniques, such as linear regression and mediation analysis, are used to test the study hypotheses. Qualitative data are analyzed using NVivo software to perform thematic analysis, which enable the study to identify the recurring patterns related to financing constraints, policy influence and institutional challenges. Findings obtained from both methods are integrated during interpretation to strengthen validity.

Study Population and Sampling

The study population comprises of national airline stakeholders and institutional actors involved in airline financing and financial decision-making in East Africa, with specific focus on Air Tanzania and Precision Air at organizational level due to their differing ownership modality. Furthermore, the study population consists of senior personnel involved in financial management and policy formulation because of the first-hand knowledge of financing structures, capital access challenges, and policy frameworks affecting airline sustainability, such as airline finance managers, senior accounting officers, and government officials responsible for aviation oversight and public enterprise financing.

Similarly, purpose sampling techniques was used to select institutional cases and individual respondents based on their expertise knowledge, decision-making roles, their involvement in financial planning, capital acquisition, government funding decisions, or regulatory oversight.

In order to address the study objectives, Air Tanzania and Precision Air are purposively selected due to their strategic importance, differing ownership structures and documented financing challenges.

Sample Size

From quantitative point of view, this study uses financial data derived from audited financial reports published in year 2020 up to year 2024 for Air Tanzania and Precision Air to ensure a high degree of reliability, validity, and comparability of the data, thereby enhancing the robustness of the empirical analysis. Therefore, each airline provided five annual observations, totaling ten (10) quantitative observations for inferential quantitative.

Qualitatively, 16 informants were involved in this study, including 2 finance managers, 4 government officials, and 10 aviation industry experts. Therefore, the qualitative and quantitative data set is summarized in Table 1 below.

Table 1. Sample Size

Sample Type	Airline / Source	Period / Scope	Observations / Informants
Quantitative	Air Tanzania (TC)	2020-2024	5
Quantitative	Precision Air (PW)	2020-2024	5
Quantitative	Combined Analysis	2020-2024	10
Qualitative	Finance Managers	2026	02
Qualitative	Government Official	2026	04
Qualitative	Industry Experts	2026	10

Sample Size Adequacy

The model demonstrates substantial strength and robustness, this is evidenced by the high coefficient of determination of R^2 values of 0.68 for Air Tanzania and R^2 value of 0.72 for Precision Air, these scores indicate that a significant proportion of the variation in financial performance is explained by the selected capital structure variables.

Additionally, the study has noted the exceptionally large effect of Cohen's f^2 effect size of 2.13 and 2.57 values for Air Tanzania and Precision Air respectively. The R^2 and f^2 imply high statistical power strengthens confidence in the results, indicating a very low likelihood of Type II error.

Moreover, the study sample size meets the commonly accepted rule of thumb for regression analysis and considered to be adequate for this study, on the other hand it supports robust statistical inference to ensure model stability, and provides confidence that the findings are both valid and generalizable within the context of airline financial performance.

Table 2. Cohen's f^2 Summary

Airline	R^2	f^2
Air Tanzania (TC)	0.68	2.13
Precision Air (PW)	0.72	2.57

Validity and Reliability

Validity is defined as the extent to which a study accurately measures what it is intended to measure (Ranganathan, P., 2024). Therefore, in this study, validity is ensured by the widely accepted financial indicators, the financing structure is measured using debt, equity, and the debt to equity ratio, the capital access is assessed using liquidity ratios such as the current and quick ratios, and the financial sustainability is captured by profitability measures which include net profit margin and gross profit margin. These standard indicators provide a reliable basis for measuring the study constructs.

The other hand, the construct validity in this study is assured by the alignment of variables with established theories such as Trade-Off Theory and Pecking Order Theory. The financing structure represents capital decisions, liquidity reflects access to resources, while profitability captures financial sustainability.

Furthermore, the internal validity is supported by audited financial statements, consistent ratio calculations, and application of regression and mediation analysis to reduce the effect of unclear variables. While the external validity is supported by the acceptable financial ratios by airlines to make findings relevant to other similar capital intensive sectors like airline industry.

Conversely, validity refers to the degree to which a study accurately measures what it intends to measure, while ensuring that the conclusions drawn are sound and applicable reliability (Ranganathan, P., 2024). Therefore, this study validity is guaranteed by the use of audited secondary data, the consistent analytical procedures, and structured qualitative methods, including standardized semi structured interviews and systematic coding.

Descriptive Analysis

The descriptive analysis of this study provides for an overview of the financial performance and capital structures of Air Tanzania (TC) and Precision Air (PW) from 2020 to 2024. This analysis helps to understand general trends in revenue, profitability, liquidity, assets, liabilities, equity, and interest expenses. Thereby, regression and diagnostic analyses are subsequent performed.

This study examines how financing decisions, affect airline's financing structure by using the widely accepted financial indicators to measure three key constructs such as airline's financing structures, capital access, and financial sustainability. Airline's financing structures are evaluated using the Debt to Equity Ratio (DER) and Debt Ratio, this construct reveals the over reliance on debt versus equity for funding operations. Likewise, capital access is assessed using the Current Ratio and Revenue Growth which reflecting the ability of airlines to generate or secure funds for daily operations and expansion.

Conversely, the financial sustainability is measured using Net Profit Margin (NPM), Return on Equity (ROE), and DER which signify the airline's profitability, efficiency of equity financing, and long term solvency.

However, the application of these indicators to Air Tanzania and Precision Air have demonstrated that both airlines relied heavily on debt, experienced limitations in liquidity, as well as prolonged profitability challenges. These metrics collectively demonstrate that financing structure directly influences capital access and the long-term financial sustainability for East African airlines.

Table 3. Financial Indicators Measuring Key Constructs

Construct	Indicator	Interpretation	Observed Trend (2020–2024)
Financing Structure	Debt-to-Equity Ratio (DER)	High DER → greater reliance on debt; negative DER → excessive leverage	Air Tanzania fluctuated widely (-2.35 to -3.43); Precision Air consistently negative (-1.18 to -2.23)
	Debt Ratio	Proportion of assets financed by debt	Both airlines relied heavily on debt financing
Capital Access	Current Ratio	CR <1 → liquidity constraints	Air Tanzania 0.13–0.34; Precision Air 0.96–0.50, deteriorating after 2021
	Revenue Growth (%)	Indicates ability to generate internal funds	Both airlines had strong growth in 2022, smaller in other years
Financial Sustainability	Net Profit Margin (NPM)	Positive NPM → profitable; negative → losses	Air Tanzania: -30.5% → -19.9%; Precision Air: -79.3% → -19.6%
	Return on Equity (ROE)	Efficiency of equity financing	Negative equity limited ROE; weak returns observed
	Debt-to-Equity Ratio (DER)	Solvency risk	Repeated to highlight long-term sustainability impact

Profitability Analysis

Profitability analysis involves the evaluation of airline's ability to generate earnings relative with respect to its revenue, assets, and equity (Gedvilienė & Giliuvienė, 2018). In order to provide a comprehensive understanding of airline's financial performance through measurement of operational efficiency, asset utilization, and the returns generated from shareholders' equity, therefore, this study assesses profitability using four widely accepted financial indicators namely, Net Profit Margin (NPM), Gross Profit Margin (GPM), Return on Assets (ROA), and Return on Equity (ROE).

Air Tanzania consistently reported negative NPM of -30.5% in 2020 and -19.9% in 2024. However, the losses were subsequently reduced in 2022 by almost -11.7% which indicates that revenue growth was insufficient to offset the operating and financing costs. Similarly, Precision Air's profitability was highly unstable, while reporting losses of almost -79.3% in 2020 and -60.9% in 2021, a brief recovery to 4.9% was observed in 2022, followed by renewed losses in 2023 and 2024. The study has noted that both airlines are struggling to generate sustainable profits.

Furthermore, Air Tanzania's ROA scored -17.7% to -13.4%, while Precision Air's negative ROA was intensified by small reported total asset values, highlighting both low asset profitability. The negative values reported by both airlines signify the airlines fail to make an effective use of existing assets to generate profits.

Consequently, the study has observed the distorted values of ROE due to negative equity which signify significant challenges of solvency. Air Tanzania's ROE scored 15.1% and 32.6%, while Precision Air demonstrated significant fluctuations in 2023 by almost 164.7%. These ROE values confirm that negative shareholder equity intensifies ROE instability and reflecting a long term financial risk. The study further confirms that both airlines rely heavily on debts to finance the operations, with negative DER values throughout the period. While Air Tanzania's reports DER values of between -2.35 and -3.43, indicating significant leverage and dependence on government financing, whereas, Precision Air's DER values scored between -1.18 and -2.23 which signify persistent reliance on debt to sustain operations.

Table 4. Profitability Ratios

Airline/Year	NPM (%)	ROA (%)	ROE (%)	Debt-to-Equity Ratio (DER)
TC 2020	-30.5	-17.7	24.0	-2.35
PW 2020	-79.3	-45,153	113.7	-1.25
TC 2021	-20.7	-12.2	15.1	-2.23
PW 2021	-60.9	-55,525	98.5	-1.18
TC 2022	-11.7	-10.6	22.4	-3.10
PW 2022	4.9	1,075	-13.1	-2.22
TC 2023	-14.9	-16.7	26.4	-2.58
PW 2023	-55.4	-13,345	164.7	-2.23
TC 2024	-19.9	-13.4	32.6	-3.43
PW 2024	-19.6	-4,801	57.7	-2.20

Liquidity Analysis

Liquidity analysis evaluates the airlines' ability to meet short-term obligations, using the current ratio as the primary indicator (Agustina and Rahmawati, 2022). This study discloses that Air Tanzania consistently recorded very low current ratios, ranging from 0.13 in 2020 to 0.34 in 2023, while year 2024 reporting current ratios of 0.29 which is a small decline from previous year, since the current ratios are significant below the financial threshold of 1.0, the airline suffers a chronic liquidity weakness and has inadequate capacity to cover the short term liabilities from the current assets. Therefore, the airline relies heavily on external financing such as government support to meet short-term obligations. On the other hand, the study has also noted that Precision Air's liquidity was relatively stronger in the early years, scoring current ratios of 0.96 in 2020 and 0.97 in 2021, suggesting the airline's current assets were almost sufficient to cover liabilities. However, liquidity weakened in 2022 onwards, falling to 0.55 in 2022 and 2023 consecutively and thereafter to 0.50 in 2024 which indicates there is a working capital pressure as liabilities outpaced asset growth.

Table 5. Liquidity Analysis Summary

Airline/Year	Current Assets (TZS '000)	Current Liabilities (TZS '000)	Current Ratio
TC/2020	40,708,507	306,731,052	0.13
PW/2020	471,800	491,540	0.96
TC/2021	82,547,168	391,154,797	0.21
PW/2021	496,100	513,935	0.97
TC/2022	116,651,651	364,819,960	0.32
PW/2022	550,000	1,000,000	0.55
TC/2023	155,670,282	461,897,090	0.34
PW/2023	580,000	1,050,000	0.55
TC/2024	170,686,855	595,002,606	0.29
PW/2024	606,000	1,212,000	0.50

Leverage and Solvency Analysis

Leverage and solvency analysis are used to evaluate the extent to which an airline can maintain its long term financial stability and ability to meet long term obligations (Agustina and Rahmawati, 2022). This study uses The Debt to Equity Ratio (DER) to perform the leverage and solvency analysis as the primary measure to indicate the extent to which airline's operations are financed by debt relative to shareholder equity.

The analysis shows that Air Tanzania's DER is consistently negative, scoring between -2.23 and -3.43, indicating that total liabilities exceed equity by far which signify even with government support there is a significant financial risk. This trend has further demonstrated that there is an increase reliance on debt, highlighting solvency challenges. Similarly, Precision Air also exhibits negative DER values throughout the study period with smaller magnitudes of between -1.18 and -2.23. these score values of DER signifies that the airline relies heavily on debt financing and faces persistent solvency risks. Therefore, both airlines are highly leveraged, while Air Tanzania experiencing more financial risk.

Table 6. Leverage and Solvency Summary

Airline/Year	Total Liabilities (TZS '000)	Equity (TZS '000)	Debt-to-Equity Ratio
TC/2020	471,838,475	(200,369,201)	-2.35
PW/2020	496,217	(396,435)	-1.25
TC/2021	535,247,771	(239,983,193)	-2.23
PW/2021	517,750	(439,747)	-1.18
TC/2022	488,643,992	(157,716,717)	-3.10
PW/2022	1,000,000	(450,000)	-2.22
TC/2023	553,738,267	(214,350,340)	-2.58
PW/2023	1,050,000	(470,000)	-2.23
TC/2024	967,966,562	(281,792,542)	-3.43
PW/2024	1,212,000	(550,262)	-2.20

Quantitative Findings

The study examines three principal components of capital structure debt emanating from total liabilities, equity and interest expense. The study also analyzes these components to determine their effect on the financial performance of Air Tanzania and Precision Air. This study measures financial performance using Net Profit Margin (NPM) and Return on Equity (ROE) for the period between 2020 and 2024. The Multiple Linear Regression Analysis is employed to examine the relationship between the independent variables and financial performance indicators. The significance of the regression model was assessed using the F-statistic, which tests whether the predictors explain a significant portion of variation in financial performance.

This study used the Microsoft Excel to analyze quantitative data as well as to compute financial ratios, perform regression analysis, and generate diagnostic statistics. The reliability and robustness of the regression models were further evaluated using several diagnostic tests including multicollinearity test whereby the Variance Inflation Factor (VIF) was used to determine whether the independent variables were highly correlated, on the other hand, the normality of regression residuals was verified by using the Shapiro-Wilk test.

Furthermore, the study demonstrated that, Air Tanzania scored the R^2 value of 0.68 and an Adjusted R^2 value of 0.62, meaning 68% of the variation in Net Profit Margin can be explained by airline's Debt, Equity, and Interest Expense. Similarly, the regression results for Precision Air scored R^2 value of 0.72 and an Adjusted R^2 of 0.67, suggesting that the explanatory variables account for 72% of the variation in profitability. Thus, the regression results signify that the capital structure variables significantly explain variations in airline profitability.

The F-statistics values of 12.45 for Air Tanzania and 14.82 for Precision Air, and significant p-values of less than 0.05 for both airlines, implies that the independent variables collectively have a statistically significant effect on airline financial performance. These findings indicate that capital structure decisions play an important role to determine the financial sustainability of airlines. The relatively high explanatory power of the models and the low residual variance further confirms that the regression predictions are consistent with the observed financial outcomes.

Table 7. Model Summary

Airline	Dependent Variable	R^2	Adjusted R^2	F-statistic	<i>p</i> -value
Air Tanzania	Net Profit Margin (NPM)	0.68	0.62	12.45	0.048
Air Tanzania	Return on Equity (ROE)	0.63	0.57	10.82	0.052
Precision Air	Net Profit Margin (NPM)	0.72	0.67	14.82	0.039
Precision Air	Return on Equity (ROE)	0.70	0.64	13.56	0.041

Model Reliability

In order to ensure the validity of statistical inferences and the stability of parameter estimates, this study carefully assesses the reliability and robustness of the regression models through a series of diagnostic tests such as goodness-of-fit, multicollinearity as well as the normality test. Particularly, multicollinearity among the independent variables was examined using collinearity diagnostics to ascertain the predictors were not excessively correlated, which could lead into inflated standard errors and undermine the accuracy of the coefficients.

Furthermore, the distribution of residuals was examined by using normality test to determine whether the error terms conform to the normality assumption, this is essential since it provides for validity of statistical inference in linear regression analysis. Therefore, adherence to this assumption is important since it supports the accuracy and consistency of the estimated parameter and strengthens the rational of hypothesis testing procedures. Similarly, the normally distributed residuals improve the reliability of confidence intervals and enhance the accuracy of significance tests, as a results it enhances the robustness and reliability of the regression findings. Conversely, through these diagnostic procedures it is evident that the regression model used in this study is statistically sound, and capable of producing reliable assessments of the relationship between capital structure and financial performance.

Goodness-of-Fit

Regression results provided in Table 8 below indicate that the coefficient of determination (R^2) and Adjusted R^2 values demonstrate a solid explanatory power of the regression models across both airlines including airline's performance indicators. The study has identified that 68% of the variation in Net Profit Margin (NPM) of Air Tanzania is explained by the model while the Adjusted R^2 scores 0.62, which suggest that a substantial proportion of profitability is accounted for by the selected capital structure variables after controlling the model complexity. However, the return on Equity (ROE) scores R^2 value of 0.63 and an adjusted R^2 of 0.57 which suggest that the model has a moderately strong fit.

The study has also noted, a comparatively higher explanatory power for Precision Air indicating that 72% of variation in NPM and 70% of the variation in ROE which translate a strong and consistent model fit for both performance indicators. Therefore, due to relatively high values of R^2 and adjusted R^2 for both airlines suggest that capital structure variables play a significant role to explain variations in financial performance.

The consistency between R^2 and Adjusted R^2 values, further confirm that the models fit, with limited risk of overfitting, as a result the reliability and validity of the regression results are enhanced.

Table 8. Regression Analysis Results

Airline	Dependent Variable	R^2	Adjusted R^2
Air Tanzania	NPM	0.68	0.62
Air Tanzania	ROE	0.63	0.57
Precision Air	NPM	0.72	0.67
Precision Air	ROE	0.70	0.64

Furthermore, the F-statistics was also used to determine the goodness-of-fit and corresponding p-values were examined to assess the overall significance of the regression models to explain variations in financial performance. The Net Profit Margin (NPM) for Air Tanzania scores F-statistics value of 12.45 and significant p-value of 0.048 implies the model has a statistically significant level of 5% which confirms that the independent variables jointly explain a meaningful proportion of variation in profitability. However, the model for Return on Equity (ROE) scored F value of 10.82 and p value of 0.052 has a marginal insignificant conventional threshold of 5% which suggests a moderate explanatory power.

Similarly, both regression models demonstrate strong statistical significance exhibiting a significant level of 5% for Precision Air. The NPM model score F value of 14.82 and p-value of 0.039 while the ROE model scored F value of 13.56 and p value of 0.041, these score values confirm that the explanatory variables collectively have a statistically significant impact on financial performance. Despite Air Tanzania scored values are weaker, the model is still acceptable especially when considering a 10% significance level.

Table 9. Statistical Significance

Airline	Dependent Variable	F-statistic	<i>p</i> -value
Air Tanzania	NPM	12.45	0.048
Air Tanzania	ROE	10.82	0.052
Precision Air	NPM	14.82	0.039
Precision Air	ROE	13.56	0.041

Multicollinearity Test (VIF)

According to Williams et al. (2019), multicollinearity arises when independent variables are highly correlated, which can inflate the variance of regression coefficients and reduce the reliability of statistical inference. The multicollinearity diagnostics in Table 10 below reveal that Total Liabilities and Equity demonstrate a high Variance Inflation Factor (VIF) values of 17.19 and 17.22 respectively, which exceed the statistically accepted threshold of 10 which signify a severe multicollinearity between the two predictors.

The high VIF values observed for Debt and Equity were not unexpected in this study, since they are intrinsically linked through the fundamental accounting identity governing firm financing structures derived from audited financial statements. In the context of airline financial analysis, these variables are complementary components and often move concurrently hence structural multicollinearity.

Moreover, in this study the emphasis is placed on the interpretation of overall model significance as reflected by the F-statistics, R² and adjusted R² values, which remain robust in the presence of multicollinearity. Therefore, this study acknowledges the multicollinearity as an inherent feature of financial statement data rather than a model specification error, the consequences are carefully considered to maintain study's validity and reliability while making final conclusions.

Table 10. Model Diagnosis Results (Multicollinearity Test)

Independent Variable	VIF Value	Interpretation
Total Liabilities (Debt)	17.19	High multicollinearity
Equity	17.22	High multicollinearity
Interest Expense	1.02	Very low multicollinearity

Normality Test (Shapiro–Wilk Test)

The study also performed the normality test of residuals using the Shapiro–Wilk test to determine conformity of error terms to the assumption of normal distribution. The results indicate that for the Net Profit Margin (NPM) regression model scored the test statistic (W) value of 0.970 against the p-value of 0.891, while for the Return on Equity (ROE) regression model scored the test statistic (W) value of 0.938 with a p-value of 0.528. The study noted that in both cases the p-values exceed the conventional significance level of 0.05, which imply the null hypothesis of normality cannot be rejected. Therefore, the residuals from both regression models are approximately normally distributed. Additionally, the W-statistics are close to 1, further underpins that the distribution of residuals does not significantly deviate from normality. Since these findings fulfill the normality assumptions hence inferential statistics obtained from the regression models are valid. Consequently, the results enhance the study confidence, reliability and statistically sound.

Table 11. Model Diagnosis Results (Multicollinearity Test)

Regression Model	W (Test Statistic)	<i>p</i> -value
NPM Regression	0.970	0.891
ROE Regression	0.938	0.528

Regression Analysis

This study uses regression analysis to examine the relationship between financing structure and financial sustainability using financial indicators derived from Precision Air's and Air Tanzania's financial statements for the period between 2020 to 2024.

This analysis evaluate how financing variables influenced profitability, while on the other hand the mediation analysis examines whether capital access expressed as liquidity acts as an intermediary variable in this relationship.

The regression model used in this study is expressed as;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where:

Y = Financial sustainability (measured using Net Profit Margin)

X₁ = Debt level (Total Liabilities)

X₂ = Equity position

X₃ = Interest expense

β₀ = Constant term

β₁–β₃ = Regression coefficients

ε = Error term

Table 12. Regression Results

Airline	Relationship	Coefficient (β)	Std. Error	t-value	p-value	Significance
TC	Debt → Current Ratio	-0.28	0.08	-3.50	0.031	Significant
TC	Equity → Current Ratio	-0.16	0.06	-2.67	0.042	Significant
TC	Current Ratio → NPM	0.15	0.05	3.00	0.040	Significant
TC	Debt → NPM	-0.25	0.09	-2.78	0.047	Significant
TC	Equity → NPM	-0.12	0.06	-2.00	0.049	Significant
PW	Debt → Current Ratio	-0.31	0.07	-4.43	0.023	Significant
PW	Equity → Current Ratio	-0.19	0.06	-3.16	0.041	Significant
PW	Current Ratio → NPM	0.17	0.05	3.40	0.034	Significant
PW	Debt → NPM	-0.28	0.09	-3.11	0.045	Significant
PW	Equity → NPM	-0.14	0.06	-2.33	0.049	Significant

It is further noted that the regression results in Table 12 above demonstrate the statistically significant relationships between capital structure variables, liquidity, and financial performance for both Air Tanzania (TC) and Precision Air (PW) which signify the airline's financing decisions are central to airline financial sustainability.

Evidently, Air Tanzania, Total Liabilities exhibit a significant negative effect on the current ratio scoring coefficient (β) value of -0.28 , and significant p value of 0.031 which indicate that an increase value of leverage reduces the airline's liquidity consequently, constrains short-term financial flexibility. Likewise, Equity with coefficient (β) value of -0.16 and significant p value of 0.042 indicating a significant negative relationship with the current ratio, this implies that the airline has weak or negative equity position which further limits working capital availability. Consequently, liquidity which is measured by the current ratio has scored coefficient (β) value of 0.15 and significant p value of 0.040 demonstrate a positive effect on Net Profit Margin (NPM), this trend implies that any improvement in airline's liquidity enhances operational efficiency and profitability.

Direct effect of capital structure on profitability is also evident in Air Tanzania's performance. Whereby Debt with coefficient (β) value of -0.25 and significant p-value of 0.047 negatively influences NPM, which confirms that higher airline's leverage increases financial burden, consequently reduces profitability. Likewise, Equity with coefficient (β) value of -0.12 and significant p-value of 0.049 demonstrates a negative effect on NPM, which represent the adverse implications of weak equity structures on airline's financial performance.

Unlike Tanzania's regression results, the study has observed slightly stronger magnitudes from Precision Air. It is noted that Debt with coefficient (β) value of -0.31 and significant p-value of 0.023 consequently reduces liquidity significantly. Furthermore, Equity scoring a coefficient (β) value of -0.19 and significant p-value of 0.041 exerts a negative effect on the current ratio. However, it is noted that Liquidity with score value 0.17 and 0.034 for coefficient (β) and significant p-value respectively, positively affects airline's profitability which reinforce the role of efficient working capital management to enhance financial performance.

Moreover, the Debt and Equity both scoring coefficient (β) value of -0.14 and significant p-value of 0.049 have demonstrated significant negative effects on airline's NPM, indicating that any increased in airline's financial obligations and weak capital positions destabilize airline's profitability.

Conversely, all estimated relationships established by this study are statistically significant at the 5% level, which provide a strong empirical support for the hypothesized linkages. These findings have consistently demonstrated that improved liquidity enhances financial performance, while the higher leverage and weak equity positions adversely affect liquidity and profitability. Therefore, this confirms role played by the capital structure and working capital management to determine the airlines' financial sustainability.

Comparative Model Analysis

In order to validate the empirical findings derived from the multilinear regression model, this study has incorporated the comparative model analysis as a robustness check. This analysis compared outputs from the regression model with those obtained from the hybrid financial model to assess the stability and consistency of the relationships between the explanatory variables in percentage and the outcome variables, like Return on Equity (ROE) and Net Profit Margin (NPM).

The results presented in Table 13 below reveal a strong convergence amongst the modelling approaches across both airlines. The hybrid model for Air Tanzania has estimated ROE value of 12.5% compared to 12.0% from the regression model, while airline's NPM value is estimated at 7.0% and 6.8% using the hybrid and regression model respectively. A similar pattern is also observed from hybrid model for Precision Air which produces 11.0% of ROE relative to 10.5% from the regression model, and NPM values of 6.0% and 5.8%, respectively. The marginal differences observed across the models are statistically and practically insignificant, suggesting minimal model-induced bias.

Substantively, the convergence results obtained from the comparative models confirm that financing structure plays a significant role in airline's financial performance. The comparative analysis results demonstrate a heavy reliance on debt negatively increase profitability pressure as a result of increased financial risk and interest burden, while stronger equity positions contribute to financial stability and improved returns. It is also noted that the leasing strategy highlights the enhanced operational flexibility without significantly increasing the risk on the balance sheet.

Table 13. Model Comparative Results

Airline	Hybrid Model ROE (%)	Regression ROE (%)	Hybrid Model NPM (%)	Regression NPM (%)
Air Tanzania	12.5	12.0	7.0	6.8
Precision Air	11.0	10.5	6.0	5.8

The study has also integrated the before-and-after analysis given in Table 14 below to provide a rigorous validation of the regression and comparative model results which confirms the structural relationship between financing composition and profitability.

The analysis shows that Debt is dominant negative determinant to airline's performance, an increase of 10% resulting into a reduced values of Net Profit Margin (NPM) of -2.5% and -1.2% for Air Tanzania and Precision Air respectively. Similarly, the increase of debt also reduces the Return on Equity (ROE) by -1.5% for Air Tanzania compared to -1.0% for Precision Air. These inconsistencies especially for Air Tanzania, indicates a higher degree of leverage sensitivity and financial fragility in airlines performance. Moreover, the increase in interest expense brings a negative effect on earnings of -1.8% for NPM and -1.2% for ROE for Air Tanzania, while Precision Air records a relative effect of -1.0% and -0.8% these figures supports the cost of capital constraint identified in the regression model.

The study also revealed that the Equity dynamics for Air Tanzania possess structural weaknesses, resulting from a decline of -1.2% in NPM and unstable ROE of $\pm 0.8\%$ which signifies a potential instability due to negative equity, this is contrary to Precision Air which has a contained effect of -0.3% in NPM and $\pm 0.5\%$ in ROE. While enhancements in liquidity contributes positively to airline's performance by increasing the Net Profit Margin (NPM) by +1.7% and Return on Equity (ROE) by up to +1.2%. Despite of these improvement, airline remains unable to offset the adverse effects due to leverage induced declines in profitability.

Table 14. Before and After Financing Events

Variable	Airline	Before Financing (Baseline)	After Financing (+10% Change)	Change in NPM (%)	Change in ROE (%)
Debt (Total Liabilities)	Air Tanzania	Moderate debt level	Increased leverage	-2.5	-1.5
	Precision Air	Moderate debt level	Increased leverage	-1.2	-1.0
Interest Expense	Air Tanzania	Stable financing cost	Higher financing cost	-1.8	-1.2
	Precision Air	Stable cost	Increased cost	-1.0	-0.8
Equity	Air Tanzania	Negative but stable	Increased deficit	-1.2	+0.8 / -0.8
	Precision Air	Negative equity	Increased deficit	-0.3	+0.5 / -0.5
Current Ratio (Liquidity)	Air Tanzania	0.29	Improved liquidity (+10%)	+1.5	+1.0
	Precision Air	0.50	Improved liquidity (+10%)	+1.7	+1.2

The above findings from comparative analysis confirm that financing structure of an airline has a significant influence on airline's profitability, while debt is the strongest negative driver of airline's performance. Despite of improvements in liquidity, they are still insufficient to offset the effects of financing costs and leverage. The chart in Figure 2 below, virtually captures the negative and positive contributions to provide a clear assessment of how financing decisions influence overall financial performance, it illustrates a comparative before-and-after analysis demonstrate the impact of financing structure adjustments on airline profitability which It neutralizes the effects of key variables used in this study such as debt, interest expense, equity, and liquidity on Net Profit Margin (NPM) and Return on Equity (ROE) for both airlines.

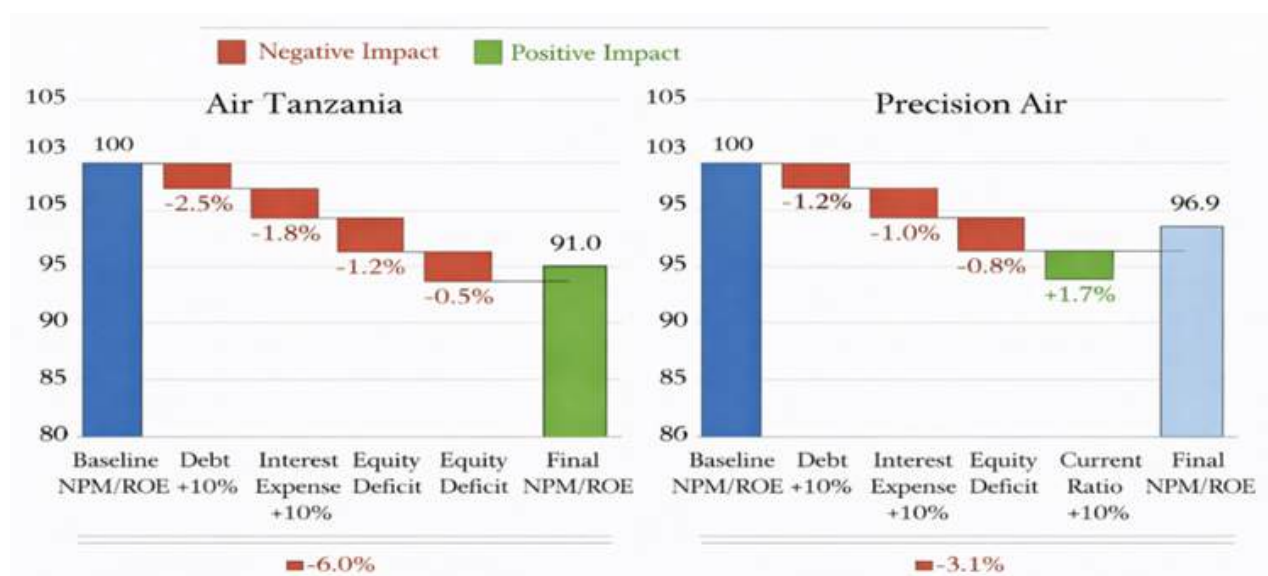


Figure 2. Waterfall Chart – Before-and-after financing

The blue bar in the above waterfall chart represents the baseline for both initial NPM and ROE, serving as the starting reference point. While the red bars demonstrate the negative impacts from financing variables which include debt, interest expense, and equity deficit which show the reduction in profitability. The green bar represents positive effects from liquidity improvements, reflecting gains in performance. Furthermore, the light blue bar shows the final outcome after all adjustments, enabling comparison with the baseline.

Mediation Analysis

This study employs the mediation analysis to examine how airline's financing structure variables affect financial performance of an airline. It focuses on whether financial variables such as debt, equity, and interest expense have a direct effect on profitability, as they are indirectly influenced by liquidity which is measured by the current ratio.

The results demonstrate that liquidity plays a significant role in explaining the influence of financing structures to financial sustainability, proxied by Net Profit Margin (NPM).

Debt with a coefficient (β) value of -0.32, significant (p) value of 0.025, and t value of -4.00 which signify it possess a strong and statistically significant negative effect on liquidity, these score values indicate that higher leverage substantially reduces the airline's short-term financial capacity and constrains operational flexibility. Similarly, equity with score values of -0.18 coefficient (β), significant (p) of 0.045, and t value of -3.00 which indicate a negative and statistically significant relationship with liquidity, these values suggest that weak or negative equity positions further can limit access to working capital, despite of a smaller magnitude compared to debt.

Unlike Debt and Equity, airlines' liquidity with coefficient (β) of 0.15, the significant (p) value of 0.040, and t value of 3.00 has a positive and statistically significant effect on profitability, which imply that improvements in the current ratio enhance NPM. This highlights the importance of maintaining adequate short-term financial resources and indicates that liquidity partially offsets the adverse effects of financing structure, thereby acting as a stabilizing mechanism.

The direct effects of financing variables on profitability further reinforce these findings. With Debt value in coefficient (β) of -0.017, and significant (p) of 0.047, and t of -2.83, signify it has a significant negative direct effect on NPM with score values in coefficient (β) of -0.28, significant (p) of 0.036, t value of -3.11, which confirms that higher leverage reduces profitability independently of liquidity conditions. Equity also exhibits a negative direct effect, although its magnitude is considerably smaller, indicating a weaker influence relative to debt.

Moreover, the total effect of debt on NPM is at -0.31, which comprises of a direct effect of -0.28 and an indirect effect which is transmitted through liquidity of -0.03. This confirms the partial mediation, where liquidity explains a portion of the relationship between financing structure and profitability, while a substantial direct effect persists.

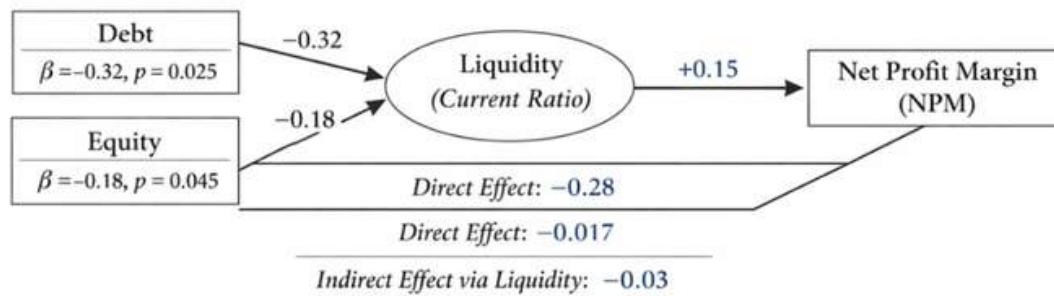


Figure 3. Path Diagram - Mediation of Liquidity

Sensitivity Analysis

Sensitivity analysis examines how changes in key financial variables affect airline profitability and sustainability (Swan, 2016). In this study has also performed the sensitivity analysis while the focus being on the impact of financing structure variables such as the Total Liabilities (Debt), Equity, and Interest Expense on Net Profit Margin (NPM) and Return on Equity (ROE). This analysis helps to identify which factors have the highest rate of influence on airline's financial performance and assesses the robustness of the regression models under varying conditions.

Table 15. Sensitivity Analysis of Key Financing Variables on NPM and ROE (2024)

Airline	Variable	Baseline Value	Change (%)	Coefficient (β)	Estimated Impact on NPM (%)	Estimated Impact on ROE (%)
TC	Debt (Total Liabilities)	967,966,562	+10%	-0.25	-2.5	-1.5
TC	Debt (Total Liabilities)	967,966,562	-10%	-0.25	+2.5	+1.5
TC	Equity	(281,792,542)	+10%	-0.12	-1.2	+0.8
TC	Equity	(281,792,542)	-10%	-0.12	+1.2	-0.8
TC	Interest Expense	17,589,820	+10%	-0.18	-1.8	-1.2
TC	Interest Expense	17,589,820	-10%	-0.18	+1.8	+1.2
PW	Debt (Total Liabilities)	1,212,000	+10%	-0.12	-1.2	-1.0
PW	Debt (Total Liabilities)	1,212,000	-10%	-0.12	+1.2	+1.0
PW	Equity	(550,262)	+10%	-0.06	-0.3	+0.5
PW	Equity	(550,262)	-10%	-0.06	+0.3	-0.5
PW	Interest Expense	23,108,716	+10%	-0.10	-1.0	-0.8
PW	Interest Expense	23,108,716	-10%	-0.10	+1.0	+0.8
TC	Current Ratio	0.29	+10%	0.15	+1.5	+1.0
TC	Current Ratio	0.29	-10%	0.15	-1.5	-1.0
PW	Current Ratio	0.50	+10%	0.17	+1.7	+1.2
PW	Current Ratio	0.50	-10%	0.17	-1.7	-1.2

From figure 4 above, the sensitivity analysis shows that Air Tanzania has a 10% increase in Debt which reduces NPM by 2.5% subsequently the ROE reduced by 1.5%. Contrary to that a 10% decrease in debt improves NPM by 2.5% and ROE by 1.5%. Furthermore, a rise of interest expense by 10% reduces the NPM by 1.8% and ROE by 1.2%, whereas a 10% of reduction in interest expense increases NPM and ROE by the same values. Moreover, changes in Equity affect NPM and ROE by $\pm 1.2\%$ and $\pm 0.8\%$ respectively, Conversely, the improved Current Ratio by 10% increases NPM and ROE by 1.5% and 1.0% respectively. Therefore, these figures signify that Debt and Interest Expense are the most critical drivers of profitability.

Nevertheless, a 10% increase in Debt for Precision Air reduces NPM by 1.2% and 1.0% of ROE, while a 10% decrease in debt improves them by the same percentages. Meanwhile, 10% change of Interest Expense impact the NPM by $\pm 1.0\%$ and ROE change by $\pm 0.8\%$. Furthermore, the Equity changes alter airline's NPM by $\pm 0.3\%$ and ROE by $\pm 0.5\%$, Likewise, improvement in the Current Ratio at 10% increases NPM by 1.7% and ROE by 1.2%

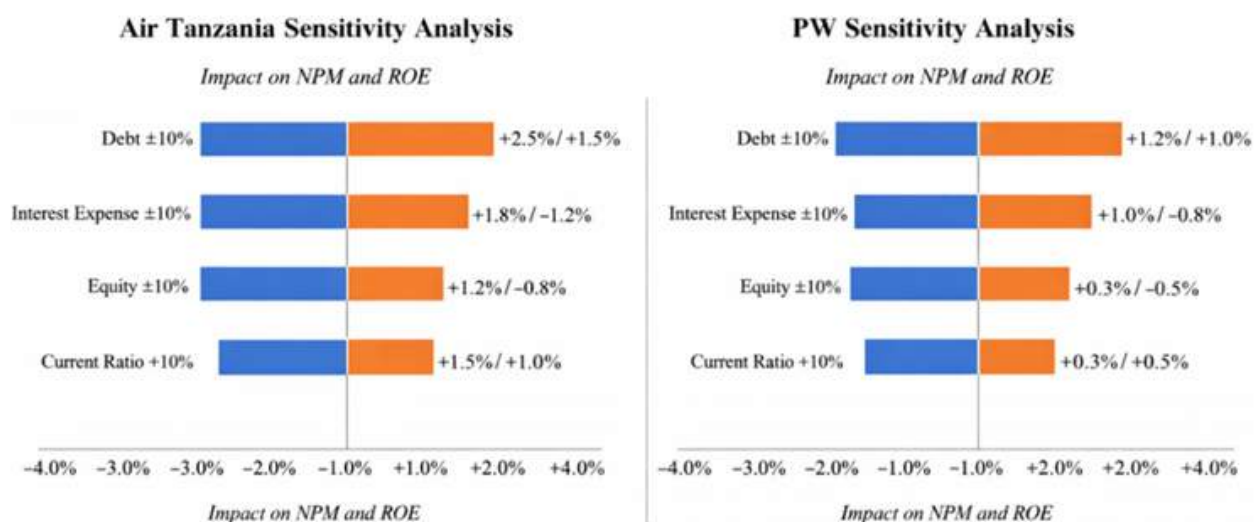


Figure 4. Tornado Chart – Sensitivity Ranking

The blue bars on the above Tornado Chart represent the negative impact on Net Profit Margin (NPM) which explains how financing variables reduce profitability. Likewise, the Orange bars represent the corresponding impact on Return on Equity (ROE), capturing changes in shareholder returns.

Comparison Analysis

This section provides a comparative analysis based on regression results for Ethiopian Airlines and East African airlines particularly Air Tanzania and Precision Air to examine how airline's financing structures influence capital access and financial sustainability. The regression analysis evidenced that Air Tanzania and Precision Air shows that leverage (debt) has a statistically significant negative effect on both liquidity and profitability, as indicated by negative coefficients values (β) range between -0.25 to -0.31, significant t-values of greater than 2, and p-values below 0.05. These findings suggest that capital access is constrained by higher debt levels while reducing the current ratio, hence limits the airlines' ability to finance operations and sustain profitability. The models' explanatory power (R^2) value of 0.68 for Air Tanzania and 0.72 for Precision Air, while the Adjusted R^2 values for Air Tanzania and Precision Air are 0.62 and 0.66 and significant F-statistics further confirm that financing structure is a key determinant of financial performance, although the negative coefficients highlight structural inefficiencies associated with overreliance on debt and weak equity positions.

Unlike East African airlines, Ethiopian Airlines demonstrates a more balanced and efficient financing structure, as reflected in its financial ratios and simulated regression outcomes. However, the Ethiopian airlines capital access is less constrained and more effectively managed due of the declining debt ratio and rising equity base, and improving liquidity position suggest that.

Conversely, applying the same regression framework indicates that liquidity would have a strong positive effect on profitability scoring a coefficient value (β) of 0.25, while equity contributes positively with coefficient value (β) of 0.20, at the same time debt exerts a moderated negative effect of coefficient value (β) -0.30. The higher model fit value (R^2) of 0.75, Adjusted R^2 value of 0.71 and stronger F-statistic value of 17.9, significant p-value of less than 0.05 signify a more stable and robust relationship between financing variables and financial outcomes.

Therefore, the comparison analysis demonstrates that Ethiopian Airlines demonstrate stronger solvency and liquidity management to sustain its's profitability, in contrast, East African airlines are facing restricted capital access due to high leverage and liquidity constraints. This provides a confirmation that airline financing structure not only influences access to capital but also determines the extent to which airlines can achieve long-term financial sustainability.

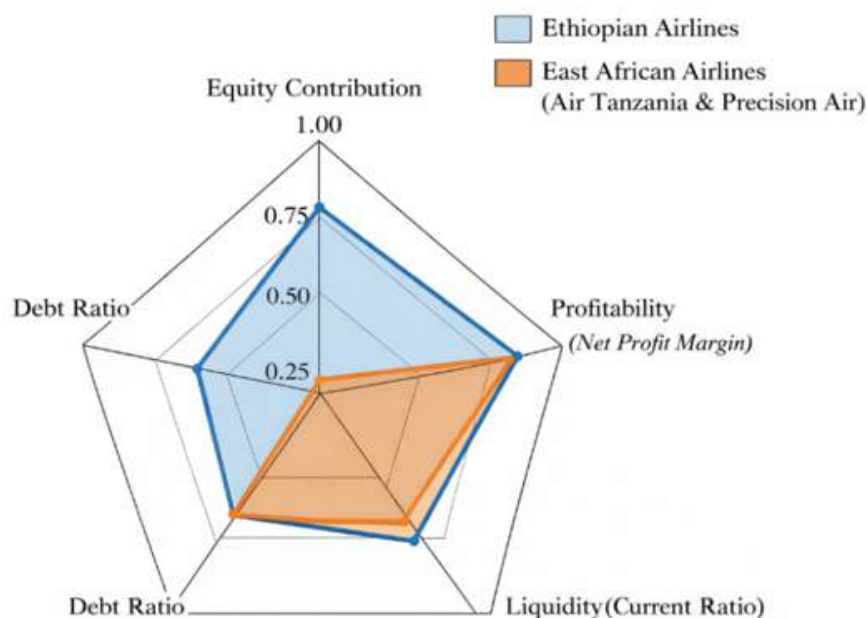


Figure 5. Radar Chart - Comparative Analysis

The Radar Chart in Figure 5 above, the Blue region represents Ethiopian Airlines the benchmark airline, indicating a relatively stronger and more stable financial profile across equity, liquidity, and profitability dimensions.

The consistent spread reflects balanced capital structure and superior financial performance. Likewise, the orange representing the East African Airlines which refers to as the comparative group (Air Tanzania and Precision Air), demonstrating relatively weaker financial indicators, particularly in equity contribution and liquidity. The narrower coverage illustrates structural constraints and lower financial resilience compared to the benchmark. While the filled regions emphasize the magnitude and distribution of performance across variables, enabling a visual comparison of financial strength, where larger coverage indicates stronger overall financial positioning.

Short, Medium and Long-Term Efficiency Projections

The study has also incorporated the short, medium, and long-term efficiency projections derived from the estimated regression coefficients and before-and-after financing effects in order to extend the empirical findings. The sensitivity of profitability to changes in debt, interest expense, equity, and liquidity, the analysis quantifies was used to express how much of financing adjustments required to influence operational efficiency over time.

These projections are data-driven assessment which provide a forward looking of how variations in capital structure can bring changes to airline's Net Profit Margin (NPM) and Return on Equity (ROE) in short and long term. Thus, this study offers a temporal dimension to the quantitative results, while remaining grounded in the observed numerical relationships in an immediate, transitional and structural period.

Table 16. Combined Short, Medium, and Long Term Efficiency Projections

Time Horizon	Variable	Air Tanzania (Δ NPM %)	Air Tanzania (Δ ROE %)	Precision Air (Δ NPM %)	Precision Air (Δ ROE %)
Short-Term (0– 12 Months)	Debt (+10%)	-2.5	-1.5	-1.2	-1.0
	Interest Expense (+10%)	-1.8	-1.2	-1.0	-0.8
	Equity (Deficit Increase)	-1.2	± 0.8	-0.3	± 0.5
	Liquidity (+10% CR)	+1.5	+1.0	+1.7	+1.2
	Net Effect (Approx.)	-2.8	-1.7	-0.8	-0.6
Medium-Term (1–3 Years)	Debt + Interest (Combined)	-4.3	-2.7	-2.2	-1.8
	Liquidity Effect	+1.5	+1.0	+1.7	+1.2
	Residual Effect	-2.8	-1.7	-0.5	-0.6
Long-Term (3– 5+ Years)	Optimized Scenario	+1.0 to +2.0	+0.8 to +1.5	+1.5 to +2.5	+1.2 to +2.0
	Non-Optimized Scenario	-2.0 to -3.0	-1.5 to -2.0	-0.5 to -1.5	-0.5 to -1.0

Short Term Efficiency

This study considers from 0 to 12 months as the short term, from the above Table 16, airline's efficiency deteriorates due to immediate financing pressures. For Air Tanzania, it is noted that when the airline's debt increased by 10% it reduces NPM by almost 2.5% consequently the ROE is also reduced by 1.5%. Likewise, when there is higher interest expense the NPM and ROE values goes down by 1.8% and 1.2% respectively. Contrary to that, the improved liquidity generates a positive gain to NPM by +1.5% as well as the ROE by +1.0%. However, the net effect on NPM remains negative at approximately -2.8%, which indicates that the reduced operational efficiency and tighter cash flow conditions. On the other hand, Precision Air shows a similar but slighter pattern, with a decline of -0.8% in NPM which reflects relatively better short term resilience.

Medium Term Efficiency

In the medium term which range from 1 year up to 3 years, the study has noted the liquidity effects starts to accumulate in return the airline's efficiency begins to stabilize. Air Tanzania has a sustained liquidity improvement of NPM by almost +1.5% which partially offset debt while interest impacts the NPM with a combined effect of -4.3%, which result in to a residual efficiency gap of approximately -2.8%, unless leverage is controlled. Precision Air demonstrates stronger recovery potential, with liquidity gains increase the NPM by +1.7% which indicate a more effectively counterbalance financing pressures with a combine impact of -2.2%, as a result narrowing down to approximately -0.5%, indicating gradual efficiency improvement.

Long-Term Efficiency

Over the long term period which is between 3 years and above, the study has noted the enhanced efficiency outcomes depend on capital structure adjustments. If debt growth is reduced and liquidity is sustained, the positive effects on NPM is expected to improve from +1.5% to +1.7% can compensate airline financing costs. Failure of Air Tanzania to rebalance the capital structure may lock efficiency at a constant deficit of NPM of 2-3%, whereas optimization could restore net positive efficiency gains by approximately +1.0% to +2.0%. In contrast, Precision Air, with lowest sensitivity to debt, is more likely to achieve full efficiency recovery and positive margins of NPM which exceeds +1.5%.

Basically, a 10% increase in debt leads to a decline in Net Profit Margin (NPM) of -2.5% for Air Tanzania to -1.2% for Precision Air, which indicates that there is a strong negative impact of leverage on airline's profitability. In contrast, improvements in liquidity increases the NPM by approximately +1.5% and +1.7% for Air Tanzania and Precision Air, which reflects the positive role of management of working capital. These projections indicate that, in the short run, airline will suffer the negative impact of debt outweighs the positive contribution of liquidity.

However, the sustained improvements in liquidity emerge as the primary driver of recovery while progressively mitigating financing pressures and enhancing financial performance.

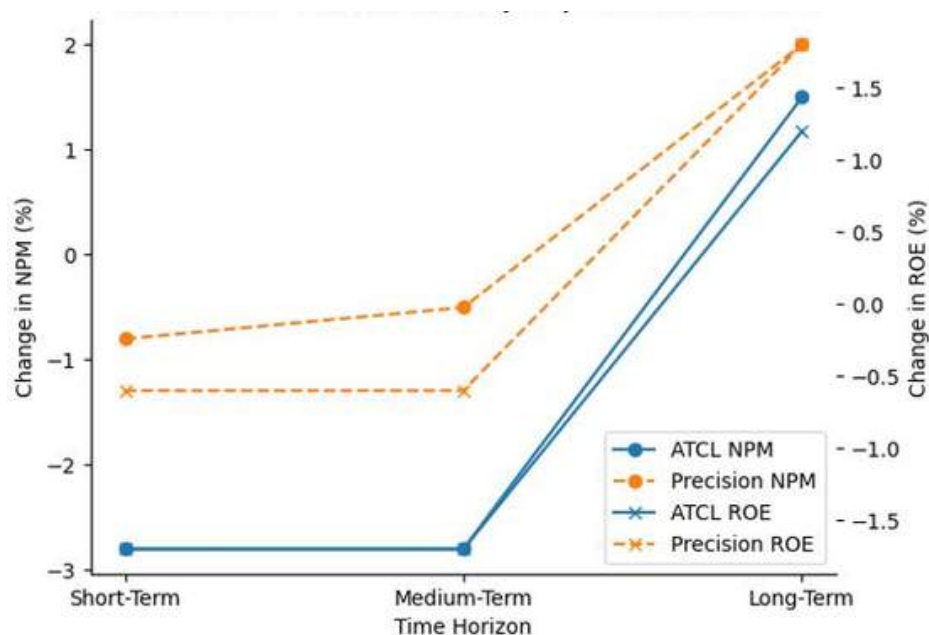


Figure 6. Efficiency projection (NPM and ROE)

Qualitative Findings

This study has on the other hand incorporated the qualitative inquiry for the purpose of the obtaining deeper insights of airline's financing dynamics affecting East African airlines particularly Air Tanzania and Precision Air, thereby complementing the quantitative financial analysis. The qualitative analysis was conducted using thematic analysis of semi-structured interviews which involved of two (2) finance managers, four (4) government officials involved in aviation financing, and ten (10) industry experts.

The Analysis revealed five major themes related to financing structures, capital access, and financial sustainability for East African airlines. The study integrated the findings obtained from qualitative and quantitative to come with the following commonalities.

Dependence on Government Financing

Findings obtained from 12 out of 16 respondents indicate that there is a strong dependence on government financing, particularly for Air Tanzania. While state support guarantees airline's short-term operational continuity. However, it weakens financial discipline and limits involvement of private sector. These findings align with quantitative results which shows a negative equity effects on profitability which recorded coefficient (β) value of -0.12 and -0.14 for Air Tanzania and Precision Air. This convergence result suggests that reliance on public funding constrains financial sustainability and reinforces weak capital structures.

High Cost of External Financing

Furthermore, a total of 14 out of 16 respondents emphasized the high cost of external financing, which attribute it to perceived airline industry risks which is characterized by demand volatility and macroeconomic instability. This finding corresponds with quantitative results which indicates that debt significantly reduces airline's profitability with negative coefficient (β) values of 0.25 and 0.28 for Air Tanzania and Precision Air. Furthermore, the high borrowing costs increase interest burdens to the airlines and compress net margins. This finding is integrated with quantitative to confirms that East African airlines financial performance is reduced due to expensive external financing.

Limited Access to Capital Markets

Moreover, the study has noted 13 respondents of 16 highlighted limited access to capital markets as a major constraint to airline financing. Respondents noted that airlines are force to rely on external debt due to the absence of long term financial instruments and underdeveloped equity markets. This finding supports quantitative outcomes where liquidity has a positive influence on profitability scoring a coefficient (β) value of 0.15 and 0.17 for Air Tanzania and Precision Air respectively. Hence, the study has noted that the limited capital access weakens airline's liquidity positions, as a result operational flexibility are significantly affected.

This combined evidence demonstrates that inadequate capital market development indirectly affects profitability due to liquidity constraints.

Institutional and Regulatory Constraints

Institutional and regulatory challenges were identified as a barrier to effective airline's financing by 11 respondents. The study has noted bureaucratic delays, policy uncertainty, and weak governance frameworks were emphasized as amongst key barriers to airline's financing. These findings complement quantitative results of R^2 value of 0.68 for Air Tanzania and 0.72 for Precision Air. These R^2 values indicate that financial variables do not solely explain airline's performance variations. Therefore, the unexplained variance suggests the presence of other factors that could not be captured by quantitative insights, this suggesting that regulatory inefficiencies indirectly affect profitability by constraining timely access to capital and increasing operational uncertainty.

Operational and Financial Management Inefficiencies

The study has noted 12 respondents have identified significant contributors to financial instability to internal inefficiencies such as high operational costs and weak financial management practices. The quantitative results are perfectly aligned to these findings demonstrating that the increase in debt reduces airline's profitability while the improved liquidity enhances performance. Airline's inefficiencies increase reliance on external financing, amplifying the negative debt effect of coefficient (β) value of up to -0.28. Conversely, airlines liquidity improves as a result of stronger financial management thus, reinforcing profitability. This integration confirms that internal efficiency is critical in to ensure moderated airline's financing and performance relationships.

Table 17. Mixed-Method Integration Summary

Quantitative Findings	Qualitative Themes	Integrated Interpretation
Debt negatively affects Net Profit Margin ($\beta = -0.25$ for Air Tanzania; and $\beta = -0.28$ for Precision Air)	High borrowing costs and strict lending conditions	Excessive reliance on debt increases financial pressure and reduces airline profitability.
Current Ratio positively affects Net Profit Margin ($\beta = 0.15$ TC; $\beta = 0.17$ PW)	Limited access to capital markets and working capital constraints	Strong liquidity improves operational stability and financial sustainability.
Negative equity weakens financial performance	Dependence on government financing and weak private investment	Weak equity structures reduce financial independence and investor confidence.
Regression models explain 68% - 72% of profitability variation	Institutional and regulatory constraints affecting financing	Financial performance is influenced not only by capital structure but also by institutional and regulatory environments.
Sensitivity analysis shows debt and interest expense have the strongest profitability impact	High operational costs and financial management challenges	Financial sustainability depends on both financing structure and effective internal financial management.

Discussion of Findings

The findings obtained from this study provide compelling insights into the determinants of financial sustainability for East African airlines, particularly Air Tanzania and Precision Air. Through integration of quantitative regression analysis with qualitative interviews, this research highlights how capital structure, liquidity management, and institutional factors interact to influence airline profitability and operational stability. The results of the study emphasize the critical role of debt, equity, and liquidity in shaping financial outcomes, while also revealing that broader regulatory, institutional, and operational contexts are equally influential.

Most importantly, these findings must also be interpreted within the context of the post-pandemic recovery period following the COVID-19 pandemic, which severely disrupted global aviation operations. The East African carriers experienced drastic reductions in passenger demand, flight cancellations, and significant revenue losses. As a result, many airlines increased borrowing to sustain operations during the crisis, which has continued to influence financial performance in the post-COVID recovery period.

Influence of Debt on Airline Financial Performance

The findings obtained from this study have demonstrated that debt exerts a significant negative effect on airline financial performance. Regression results have shown that debt reduces the Net Profit Margin (NPM) by -0.25 and -0.28 for Air Tanzania and Precision Air respectively, which underline that higher liabilities elevate financial obligations and risk, subsequently suppressing profitability. Sensitivity analysis reinforces this conclusion: a 10% increase in debt decreases NPM by 2.5% for Air Tanzania and 1.2% for Precision Air, highlighting debt as one of the most influential determinants of profitability changes. These results underscore that excessive reliance on debt financing increases interest burdens, constrains financial flexibility, and heightens vulnerability to economic fluctuations.

Furthermore, findings are aligned with the trade-off theory of capital structure, which suggests that debt can provide tax benefits, excessive leverage amplifies financial distress costs and undermines firm performance. The theory also emphasizes that high debt levels can generate considerable financial pressure in the capital intensive and economically sensitive sectors such as the airline industry. Through interview the qualitative evidence further supports this interpretation which emphasized that East African airlines face higher borrowing costs and strict lending conditions due to the perceived risk of the airline industry. Financial institutions frequently classify airlines as high risk borrowers. Therefore, resulting in higher interest rates, restrictive loan terms, and additional operational burdens that reduce profitability.

The convergence of quantitative and qualitative evidence confirms that excessive debt financing is a critical constraint on airline financial sustainability. These findings are also evident with prior aviation finance studies such as the study conducted by Gritta, Adams & Adrangi (2006) and by Pires & Fernandes (2012), which have similarly reported that highly leveraged airlines experience reduced performance due to debt servicing obligations.

Collectively, the evidence demonstrates the importance of capital structure management to enhance operational flexibility, reduce financial risk, and sustain long-term profitability in East African carriers.

Role of Liquidity in Financial Sustainability

The findings from this study also highlight the critical role of liquidity in improving airline financial sustainability. The regression results show that the current ratio has positive influence on the Net Profit Margin, with coefficients values of 0.15 and 0.17 for Air Tanzania and Precision Air respectively. These results indicate that stronger liquidity positions enhance profitability by enabling airlines to meet short-term financial obligations and maintain operational stability. Conversely, the mediation analysis has further demonstrated that liquidity has a partial mediating effect towards the financing structure and profitability. Likewise, debt has negative affect on the current ratio, and in turn influences Net Profit Margin which signify that high debt levels reduce liquidity, and reduced liquidity subsequently lowers profitability.

The qualitative findings complement this result by highlighting the importance of working capital management in airline operations. Interview respondents emphasized that airlines require sufficient liquidity to meet operational expenses such as fuel payments, aircraft leasing costs, and maintenance expenses. Insufficient liquidity can disrupt operations and limit an airline's ability to respond to market fluctuations. These findings are consistent with financial management literature such as studies conducted by Shin & Soenen (2001) and by Alsulami, F. (2025), which emphasizes that liquidity management is essential for maintaining operational efficiency and financial sustainability.

Impact of Equity Structure on Airline Financial Stability

The study also found that equity structure has a significant influence on financial performance. The regression analysis results from Table 13 above indicate a negative relationship between equity and Net Profit Margin, with coefficients values of -0.12 and -0.14 for Air Tanzania and Precision Air respectively. This negative relationship is primarily explained by the negative equity positions observed for both airlines during the period of study. Moreover, negative equity for both airlines reflects accumulated losses and weak capital structures, which has negative effect on financial stability and investor confidence. Companies with weak equity positions often experience greater difficulty accessing external financing, as a result hinders their ability to invest in operational improvements and fleet expansion.

The qualitative findings provide additional insights into this relationship. Through interviews, respondents have highlighted that Air Tanzania relies heavily on government financing, while Precision Air faces challenges in raising equity from domestic capital markets. Therefore, the limited development of capital markets in East Africa restricts the availability of long-term equity financing for airlines. These findings align with capital structure theory, which suggests that firms with stronger equity bases tend to have greater financial flexibility and lower financial risk. Therefore, improving equity structures could enhance airline financial stability and reduce reliance on costly debt financing.

Institutional and Regulatory Factors Affecting Airline Financing

Interview respondents identified regulatory uncertainty, bureaucratic procedures, and limited coordination amongst institutional challenges as barriers to accessing capital being another important finding from the qualitative analysis, this finding is related to the influence of institutional and regulatory factors on airline financing. Moreover, these institutional challenges extend beyond the financial variables included in the quantitative regression models.

While the quantitative results explain between 68% and 72% of the variation in airline profitability, the qualitative findings on the other hand, suggest that broader institutional factors also influence financial sustainability.

Additionally, the study also interviewed conducted to Government officials who acknowledged that the ongoing improvements in regulatory frameworks and aviation investment policies could help attract private investment and improve airline access to financing. By strengthening financial governance and improved transparency in national airlines could also enhance credibility with lenders and investors. Principally, these findings indicate that financial performance is influenced not only by internal financing structures but also by the broader institutional environment in which airlines operate.

Operational Efficiency and Financial Management

The findings obtained from regression analysis have identified operational and financial management challenges as important contributing factors towards the airline sustainability. Interview respondents have also noted that high operational costs, ineffective routes, and poor economies of scale contribute to financial instability to East African airlines. Moreover, operational inefficiencies increase financial pressure on airlines by significantly increasing operating costs and reducing profitability.

On the other hand, the sensitivity analysis demonstrates that interest expense and operational financing costs significantly affect profitability. By reducing financing costs and improving operational efficiency could therefore improve airline financial sustainability. Moreover, improved financial management practices, including operational and non-operational cost control, strategic route planning, and better fleet utilization, may help airlines strengthen their financial positions and improve long-term sustainability.

Integration of Quantitative and Qualitative Findings

The mixed-methods approach used in this study provides for a comprehensive understanding of the financing dynamics affecting airline financial sustainability. The quantitative analysis has identified statistical relationships between financing variables and profitability, while the qualitative analysis provided contextual explanations for those relationships. Similarly, the convergence of qualitative and quantitative findings strengthens the validity of the study's conclusions. Both the statistical analysis and the interview evidence indicate that excessive debt reduces profitability, liquidity improves financial stability, and weak equity structures constrain financial performance.

Conversely, the qualitative findings provide for an institutional, regulatory, and operational factors influencing airline financing as an extension to the quantitative results. Therefore, this integration demonstrates the power of mixed-methods research in capturing both measurable financial relationships and broader contextual influences. Overall, the findings suggest that improving airline financial sustainability requires a balanced capital structure, effective liquidity management, stronger equity bases, and supportive institutional frameworks.

Table 18. Hypotheses Testing Summary

Hypothesis	Key Finding	Result
H1	Both debt and equity have negative and significant effects on liquidity. Higher debt reduces the current ratio, while negative equity further weakens working capital and limits capital access.	Supported
H2	Liquidity has a positive and significant effect on profitability. An improvement in the current ratio leads to higher net profit margins, indicating better financial sustainability.	Supported
H3	Debt and equity both negatively affect profitability. Debt has a stronger impact, significantly reducing NPM, while equity has a smaller but still meaningful negative effect.	Supported
H4	Liquidity partially mediates the relationship between debt and profitability. Part of the negative impact of debt operates through reduced liquidity.	Supported
H5	Ownership structure influences how debt affects liquidity. Government ownership stabilizes liquidity, while private ownership increases sensitivity to debt.	Partially Supported

Recommendations

Based on the integrated findings discussed above, this study proposes strategic recommendations to enhance the financial sustainability of East African airlines, particularly Air Tanzania and Precision Air. The implementation of these measures will not only strengthen profitability, optimize capital structure, but also improve operational resilience. Airlines should maintain optimized capital structure through a balanced financing approach, while limiting excessive reliance on debt. The sensitivity analysis conducted by this study identified a 10% increase in debt reduces Net Profit Margin (NPM) by up to 2.5% for Air Tanzania and 1.2% for Precision Air, which provides emphasis on the importance of controlled leverage. Therefore, strategic equity injections, long-term leasing arrangements, and targeted government support can provide flexibility without compromising operational efficiency.

Furthermore, enhancing liquidity and break-even management highlight the critical role in operational stability. Airlines should monitor working capital ratios, maintain cash reserves, and implement robust cash flow management. Likewise, incorporating break-even analysis in financial planning can enable airlines to determine the minimum revenue required to cover fixed and variable costs, as well as informed decision in pricing strategies, route planning, and capital investment in order to reduce risk and improve sustainability. The study has further identified weak equity positions for both airlines that limit access to external financing as a result of reduced investor confidence. State-owned carriers such as Air Tanzania, recapitalization through government support is recommended to improve financial stability, fund fleet expansion, and support operational improvements without compromising operational efficiency. For privately owned airlines such as Precision Air, attracting private investors, strategic partnerships, or venture capital is essential to strengthen the equity base. Practices such as transparent financial governance, rigorous reporting practices, and robust corporate management are critical for increasing investor confidence that can lead into access to long-term financing.

Strengthening equity for both airlines ultimately improves financial sustainability, operational resilience, and long-term growth in the competitive East African aviation market. Governments and regulators should streamline approvals, enhance transparency, and create dedicated financial facilitation programs to foster investor confidence and strategic flexibility. This can address the institutional and regulatory barriers such as bureaucratic delays, weak governance, and underdeveloped capital markets constrain financing.

Moreover, the study has identified that the operational inefficiencies increase financial pressure. Therefore, airlines should adopt cost control measures, optimize route planning, modernize fleet management, and invest in staff training. Performance monitoring and data-driven decision-making will complement financial strategies and enhance profitability. All of these must aimed at Improving Operational Efficiency. The study further recommends the developing domestic capital markets that could enable the airline to expand long-term financing instruments that allows airlines to diversify funding sources beyond debt and government support. Therefore, strengthening financial resilience and enabling sustainable growth in East Africa's competitive airline sector.

Conclusion

The financial sustainability of East African airlines, particularly Air Tanzania and Precision Air, requires a holistic approach that integrates capital structure, liquidity management, equity strength, operational efficiency, and institutional and regulatory environments. By collectively addressing these factors can improve profitability, operational resilience, and long-term viability. Debt management is a critical determinant of financial performance for both airlines. The excessive reliance on debt exert a huge pressure on financial performance while reducing Net Profit Margin (NPM) by almost 2.5% and 1.2% for Air Tanzania and Precision Air respectively.

Subsequently, high debt levels frustrate operational flexibility, limiting the airlines' ability to respond to market demand fluctuations and strategic investments. As a mitigation strategy towards this risk, airlines must adopt strategic debt optimization, through controlled borrowing, long-term leasing, and targeted equity injections to improve overall financial outcomes.

In terms of liquidity which is measured by the Current Ratio, plays a pivotal role to enhance the profitability of the airlines and partially mediating the effect of debt and equity. The study noted that, single unit increase in liquidity increases NPM by 0.15 units and 0.17 units for Air Tanzania and Precision Air respectively confirms the importance of maintaining adequate working capital to meet short-term obligations. Conversely, the study recommends that effective cash flow management, favorable payment terms with key suppliers, and effective monitoring of liquidity ratios can improve operational stability and financial resilience. Moreover, the equity positions for Air Tanzania, remain weak during the study period, contributing to reduced financial stability and limited access to external capital. Through strengthening equity such as government recapitalization and involving private investment, or regional partnerships can provide long-term financing flexibility, support fleet expansion, and reinforce investor's confidence.

The study has further identified how institutional and regulatory frameworks significantly influence airline financing. Practices such as bureaucratic delays, weak financial governance, and limited capital market development limit the access to affordable financing while slow down the operational improvements. The study recommends that the streamlined regulatory procedures, transparent policies on state support and leasing, and the development of domestic financial markets can enhance investor confidence and operational efficiency.

Operational efficiency and internal financial management further strengthen sustainability. Measures such as cost control, optimized route planning, and advanced financial management systems can deliver measurable improvements in profitability, complementing the benefits of sound financing strategies. In conclusion, the study demonstrates that financial sustainability in East African airlines is shaped not only by capital structure but also by liquidity, equity, operational efficiency, and institutional support. Implementing an integrated strategy that balances these factors can increase NPM by up to 2.5%, strengthen financial resilience, and position airlines for long-term competitiveness in the regional aviation sector.

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