

BOARD TENURE, FINANCIAL RISK MANAGEMENT AND FINANCIAL PERFORMANCE: EVIDENCE FROM NON-FINANCIAL FIRMS LISTED ON THE NAIROBI SECURITIES EXCHANGE

BY

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Abstract

This study examined whether financial risk management mediates the relationship between board tenure and the financial performance of non-financial firms listed on the Nairobi Securities Exchange - Kenya. A longitudinal research design was applied to a panel of 28 firms from 2016-2024, yielding 252 firm-year observations. Board tenure was measured as the average years of service of directors; financial risk management by a composite Financial Risk Index of liquidity, leverage and asset-concentration; financial performance by return on assets and return on equity. Mediation was analysed through a hybrid within-between panel model, with year effects, firm-clustered standard errors and controls for board size, independence, gender diversity and ownership concentration. The indirect effect was tested with a 2,000-replication firm-level bootstrap. Findings indicated that board tenure is not directly associated with ROA or ROE, either within or between firms. Between firms, however, longer-serving boards carried significantly less financial risk ($\beta = -0.0146$, $p = 0.007$). This held in every robustness check. Firms with higher financial risk earned lower ROA ($\gamma = -0.2967$, $p = 0.025$). The indirect effect of tenure on ROA through financial risk was positive but not significant ($a \times b = 0.0043$; 95% CI $[-0.0006, 0.0125]$). The study concluded that board tenure matters for financial risk management and financial performance among NSE-listed non-financial firms in Kenya. It is recommended that board renewal policies balance continuity and risk oversight for better performance.

Keywords: Board tenure; Financial risk management; Financial performance; Mediation analysis; Hybrid panel model; Nairobi Securities Exchange

1. Introduction

1.1 Background and rationale

Financial performance indicates how effectively a firm uses its resources to generate wealth for shareholders (Onsongo et al. 2020). Moreover, consistent performance is widely read by the market as a signal that a firm is well governed (Kiptanui, 2020; Onsongo et al., 2020). Accounting-based measures such as return on assets (ROA) and return on equity (ROE) capture historical efficiency of how firms are able to convert assets and equity into profit (Fatihudin & Mochklas, 2018). Among the explanations offered

for differences in performance, corporate governance has attracted attention. This is because the board provides the strategic direction and intellectual capacity needed to navigate financial uncertainties (Kijkasiwat et al., 2022).

Board tenure is a governance attribute on which the theoretical expectations are divided. Defined as the length of time directors have served on a board, Tenure reflects institutional memory (Darouichi et al., 2021). Proponents of extended tenure argue that long-serving directors accumulate firm-specific knowledge and a historical understanding of the firm's risk

trajectory. This is important for long-term financial sustainability (Kiptanui, 2020; Livnat et al., 2021). Critics counter that long tenure breeds familiarity with management, encourages entrenchment and results into loss of objective monitoring (Vafeas, 2003; Oon & Chia, 2025). In Kenya, the Capital Markets Authority (CMA) Code of Corporate Governance Practices for Issuers of Securities to the Public reflects the second view by capping the tenure of independent directors at nine years (Capital Markets Authority, 2015).

The Kenyan capital market offers a setting for this debate. Although the CMA reports governance compliance scores above 70% for listed firms (Capital Markets Authority, 2015), several firms on the Nairobi Securities Exchange (NSE) have faced regulatory sanctions, trading suspensions, receivership or liquidation (cf. *East African Cables PLC v Equity Bank (Kenya) Limited*, 2024; *In re Cytonn High Yields Solutions (In Liquidation)*, 2024; *In re Nakumatt Holdings Limited*, 2017). Also, recent records include cases in which long-established boards failed to prevent financial crises. This compliance-performance paradox raises the question of whether board tenure has any bearing on firms' financial performance and, if so, through what channel.

One plausible channel is financial risk management. Risk management not only shields a firm against losses but can also create value by protecting cash flows and optimizing the capital structure against macroeconomic shocks (Andersen et al., 2013; Hoyt & Liebenberg, 2011). If experienced boards manage the liquidity, leverage and assets well, tenure may affect performance (Korir et al. 2025). Existing studies of board tenure, however, have almost exclusively tested direct relationships with performance. Moreover, Kenyan studies linking governance and risk have concentrated on banks (Wanjiru, 2013; Wanjohi, 2017; Aluoch, 2023).

1.2 Theoretical and empirical foundations

Three theories frame this study. Upper Echelons Theory holds that organisational outcomes reflect the experience, values and cognitive bases of top decision-makers (Hambrick & Mason, 1984; Hambrick, 2007). Director tenure is one of the demographic characteristics through which this experience is expressed. Longer-serving directors are expected to have richer firm-specific knowledge and a clearer view of the firm's risk exposures (Hambrick & Mason, 1984). The theory has, however, been criticised for treating demographic proxies as stand-ins for psychological processes (Lawrence, 1997).

This is why this study examines an observable outcome of board experience, namely the firm's financial risk position. Agency Theory highlights that boards attributes may help to monitor managers whose interests may diverge from those of shareholders (Jensen & Meckling, 1976; Eisenhardt, 1989). From this perspective, long tenure is double-edged: experience improves the board's ability to monitor (Vafeas, 2003). Resource Dependence Theory highlights that board could provide expertise, legitimacy and external linkages. Tenure contributes to this through institutional continuity and stable stakeholder relationships (Pfeffer & Salancik, 1978; Pugliese et al., 2014; Akram & Abrar Ul Haq, 2022).

In addition to the above theories, Enterprise Risk Management (ERM) framework supplies the mediating mechanism. ERM describes how governance oversight is translated into the identification, assessment, monitoring and communication of risk within the firm's risk appetite (Committee of Sponsoring Organizations of the Tread way Commission [COSO], 2017; International Organization for Standardization [ISO], 2018). Whereas Agency Theory explains why monitoring is needed, ERM explains how it is carried out in practice (Hoyt & Liebenberg, 2011).

Empirical findings on board tenure are mixed. Livnat et al. (2021) found that longer average board tenure was associated with higher valuations among US firms listed on the NYSE and NASDAQ between 1996 and 2014. The study argued that arbitrary tenure limits may destroy value by removing the most knowledgeable directors. Oon and Chia (2025) studied 300 Malaysian non-financial firms over 2017-2019 and found that tenure was positively associated with ROA, ROE and Tobin's Q. However, the tenure of independent directors was negatively associated with Tobin's Q. Ji et al. (2021) examined firms in 37 countries and found that tenure diversity reduced stock return volatility. The study highlighted that the tenure structure of a board is related to firm risk as well as to performance.

Other studies show that governance improves risk management and that risk management in turn improves performance (Malik et al., 2020; Bhuiyan et al., 2021). A small number have tested risk management as a mediator between governance and performance, with conflicting results. Aziza and Aviola (2024) found partial mediation in Indonesian banks, whereas Fauziah et al. (2025) found no mediation by risk governance in Indonesian Islamic banks. Kijkasiwat et al. (2022) found that financial leverage mediated the relationship between board characteristics and performance across developed and emerging economies.

In Kenya, Korir et al. (2025) evaluated 41 non-financial firms listed on the Nairobi Securities Exchange over the period 2014-2023. They found a positive and statistically significant relationship between board tenure and firm performance. They concluding that longer-serving boards enhance oversight and performance. Also, Kiptanui (2020) studied governance mechanisms and risk management among non-financial Kenyan listed firms. The study highlighted that extended director tenure builds firm-specific knowledge and institutional memory vital for long-term financial

sustainability. Despite these findings, literature on board tenure leaves a research gap highlighted below.

1.3 Research gap

Two gaps motivated this study. Methodologically, the literature tenure relies on direct-effect models that treat governance and risk management as parallel predictors of performance. This leaves the process through which tenure might operate untested. Contextually, the few studies that test risk management as a mediator are based on banks, whose risk parameters are set by prudential regulation and whose business is the extension of credit. This implies that their findings are limited and are not directly transferable to non-financial firms (Aziza & Aviola, 2024; Fauziah et al., 2025). A further methodological issue is that the most used method of analysis in these studies is pooled estimates or fixed-effects estimates. Governance attributes change slowly within firms, so pooled estimates largely reflect differences between firms, whereas fixed-effects estimates discard those differences altogether. This study addresses these gaps by separating within-firm from between-firm effects. It also tests the indirect effect directly.

1.4 Objectives and hypotheses

The general objective of the study was to assess the mediating role of financial risk management in the relationship between board tenure and the financial performance of NSE-listed non-financial firms. The specific objectives were to assess (i) the relationship between board tenure and financial performance; (ii) the relationship between board tenure and financial risk management; (iii) the relationship between financial risk management and financial performance; and (iv) the mediating role of financial risk management in the relationship between board tenure and financial performance. Hence, the following null hypotheses were tested:

H₀₁: There is no statistically significant relationship between board tenure and the financial performance of NSE-listed non-financial firms.

H₀₂: There is no statistically significant relationship between board tenure and the financial risk management of NSE-listed non-financial firms.

H₀₃: There is no statistically significant relationship between financial risk

management and the financial performance of NSE-listed non-financial firms.

H₀₄: Financial risk management does not significantly mediate the relationship between board tenure and the financial performance of NSE-listed non-financial firms.

Figure 1 presents the conceptual framework, adapted from the mediation model of Manzoor et al. (2021).

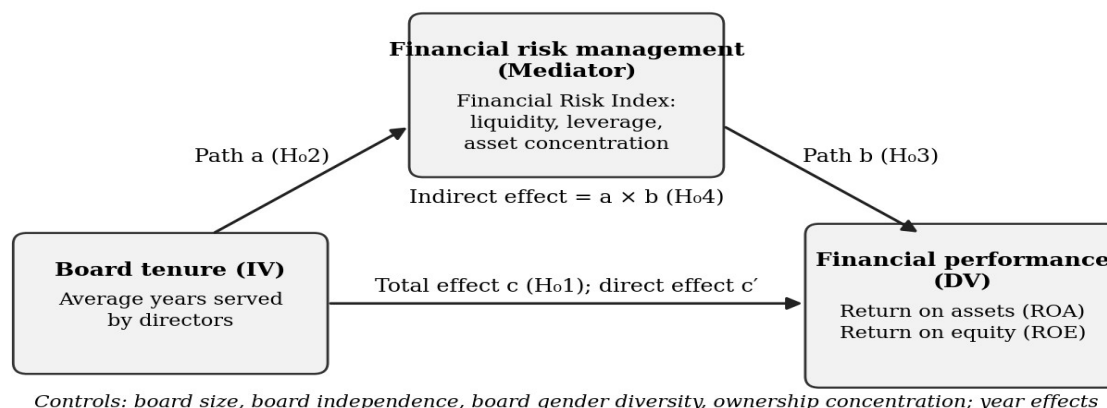


Figure 1. Conceptual framework. *Source:* Adapted from Manzoor et al. (2021).

2. Research Methodology

2.1 Research design

The study adopted a longitudinal research design. Secondary panel data for 2016-2024 collected from NSE-listed non-financial firms was used. This starting period targeted the adoption of the CMA (2015) Code and spans the COVID-19 disruptions of 2020-2022 and currency volatility in Kenya of 2023-2024. Panel data allowed unobserved, time-invariant firm heterogeneity to be controlled. This also increases degrees of freedom and allows the separation of differences between firms from changes within firms over time (Baltagi, 2021; Wooldridge, 2010).

2.2 Population, sample and data sources

The target population comprised all 55 non-financial firms listed on the NSE as of 31 December 2024. Financial institutions were

excluded because their capital and risk exposures are governed by prudential regulators, which makes their risk measures incomparable with those of non-financial firms. A census approach was applied, with two inclusion criteria: continuous listing throughout 2016-2024 and publication of audited annual reports for all nine years. Twenty-eight firms met both criteria, yielding a balanced panel of 252 firm-year observations. ROE could not be computed for eight of the nine years for one firm which produced false positive results after dividing a negative by a negative. Thus, the ROE sample had 244 observations. Because suspended and delisted firms were excluded, the results are subject to potential survivorship bias and may apply to continuously listed firms.

Data was collected with the aid of a structured extraction sheet. Audited financial statements,

integrated annual reports, corporate governance statements, CMA filings and NSE publications provided the sources of data used. Data on governance was taken from board profiles and corporate governance statements, and data on financial performance from the audited statements of financial statements. Reliability was ensured by dual data entry and cross-verification across sources, and content validity of the extraction instrument was reviewed by financial experts. All analyses were performed using State 18.

2.3 Measurement of variables

Table 1 summarises the variables. Board tenure was measured as the average number of years of service by the directors on the board at year end (Walters et al., 2007). Financial risk management was operationalised through a composite Financial Risk Index (FRI) that captures exposure to liquidity (current ratio), leverage and asset

concentration (Andersen et al., 2013). In order to have a standardized FRI measure, current ratio (CR) was converted into a liquidity-shortfall score i.e, $\max(0, 1 - CR)$, which equals zero when current assets cover current liabilities and rises towards one as liquidity deteriorates. Figures for leverage (debt-to-equity ratio) and asset concentration (largest asset class $\div$ total assets) were used in their original form (Muriithi & Waweru, 2017; Jiao, 2025). The index (FRI) became the arithmetic mean of the three components:

$$FRI_{it} = [\max(0, 1 - CR_{it}) + LV_{it} + AC_{it}] \div 3 \dots \dots \dots (1)$$

A higher FRI denotes greater financial risk exposure and therefore weaker financial risk management. Board size, board independence, board gender diversity and ownership concentration were included as governance controls (Gaur et al., 2015).

Table 1. Variables, measurement and sources

Variable	Role	Measure	Source
Board tenure (BT)	Independent	Average number of years served by directors	Board profiles and appointment dates
Financial Risk Index (FRI)	Mediator	$[\max(0, 1 - CR) + LV + AC] / 3$	Audited statement of financial position and notes
Liquidity (CR)	FRI component	Current assets ÷ current liabilities	Audited statement of financial position
Leverage (LV)	FRI component	Debt-to-equity ratio	Audited statement of financial position
Asset concentration (AC)	FRI component	Largest asset class ÷ total assets	Audited statement of financial position and notes
Return on assets (ROA)	Dependent	Net income ÷ total assets	Audited financial statements
Return on equity (ROE)	Dependent	Net income ÷ shareholders' equity	Audited financial statements
Board size	Control	Number of directors at year end	Disclosures on Corporate governance and
Board independence	Control	Independent non-executive directors ÷ board size	Board profiles
Board gender diversity	Control	Female directors ÷ board size	Board profiles
Ownership concentration	Control	Share of equity held by the five largest shareholders	Top shareholders disclosure

Note. All variables measured annually for 2016-2024. *Source:* Research data (2026).

2.4 Data preparation

Financial ratios contained a few extreme values arising from losses or very small equity bases. Such observations can dominate least-squares estimates (Leone et al., 2019). ROA and ROE results were therefore winsorized at the 1st and 99th percentiles, which retains all observations and preserves the balanced panel. The FRI components were not winsorized because the liquidity component is bounded and the index averages its three components. During robustness check, the performance measures were again winsorized at the 5th and 95th percentiles.

2.5 Model specification

Three equations were estimated for each performance measure (FP = ROA or ROE). Model

1 gives the total effect of board tenure on performance (H₀₁); Model 2 gives the effect of board tenure on financial risk (path *a*, H₀₂); and Model 3 gives the effect of financial risk on performance (path *b*, H₀₃) and the direct effect of board tenure (*c*):

$$FP_{it} = \beta_1 BT_{it} + \sum_k \delta_k C_{kit} + \mu_i + \lambda_t + \varepsilon_{it} \dots \dots \dots (2)$$

$$FRI_{it} = \alpha_1 BT_{it} + \sum_k \delta_k C_{kit} + \mu_i + \lambda_t + \varepsilon_{it} \dots \dots \dots (3)$$

$$FP_{it} = \gamma_1 BT_{it} + \gamma_2 FRI_{it} + \sum_k \delta_k C_{kit} + \mu_i + \lambda_t + \varepsilon_{it} \dots \dots \dots (4)$$

where *C* denotes the four governance controls, μ_i a firm-specific effect, λ_t a year effect and ε_{it} the error term. Because governance attributes change

slowly within firms while differences between firms are large, each model was estimated in the hybrid within-between (correlated random effects) form (Mundlak, 1978; Schunck, 2013; Bell & Jones, 2015). Every time-varying regressor X enters as its firm mean over the period, $\bar{X}_i$, and as the annual deviation from that mean, $X_{it} - \bar{X}_i$:

$$FP_{it} = \beta_0 + \sum_k \beta W_k(X_{kit} - \bar{X}_{ki}) + \sum_k \beta B_k \bar{X}_{ki} + \lambda_t + u_i + \varepsilon_{it} \dots \dots \dots (5)$$

The within-firm coefficient βW is numerically identical to the fixed-effects estimate and shows whether a change in tenure within the same firm is associated with a change in the outcome; it is protected against all stable firm characteristics. The between-firm coefficient βB compares firms whose average tenure differs and is interpreted as an association across firms. Each hypothesis was tested in both dimensions.

2.6 Estimator selection and diagnostic tests

The choice among pooled OLS, fixed effects and random effects was informed by the F-test for firm effects, the Breusch-Pagan LM test, the Hausman (1978) test and its cluster-robust Mundlak version. The models were tested for multicollinearity (variance inflation factors), specification (a panel RESET), group wise heteroskedasticity (modified Wald test), first-order serial correlation (Wooldridge test; Drukker, 2003), cross-sectional dependence (Pesaran, 2004) and normality of residuals (Shapiro-Wilk). The hybrid model was estimated by pooled OLS with year effects and standard errors clustered by firm, which keeps the within-firm coefficients identical to fixed effects and makes the mediation decomposition exact. For the unbalanced ROE sample, the firm means of the year dummies were added (Wooldridge, 2019). Because there are only 28 clusters, key p-values were verified with the wild cluster bootstrap (Cameron et al., 2008).

2.7 Mediation analysis

Mediation was assessed within the three-equation system, following the logic of Baron and Kenny

(1986) but basing the decision on a direct test of the indirect effect (Zhao et al., 2010; Hayes, 2018). The total effect c is the tenure coefficient in Model 1, path a its coefficient in Model 2, path b the FRI coefficient in Model 3 and the direct effect c' the tenure coefficient in Model 3. Because the same estimator, year effects and sample are used in all equations, the total effect decomposes exactly as $c = c' + a \times b$ in each dimension (Zhang et al., 2009). The indirect effect was tested with a non-parametric cluster bootstrap in which whole firms were resembled with replacement 2,000 times, with firm means and deviations recomputed in each sample; mediation is supported when the 95% percentile or bias-corrected confidence interval excludes zero (Preacher & Hayes, 2008). The Sobel (1982) test is reported as supplementary evidence. Outcomes were classified with the typology of Zhao et al. (2010).

2.8 Ethical considerations

The study used only publicly available secondary data and involved no human participants. To fulfill the requirement for research in Kenya, a research licence was obtained from the National Commission for Science, Technology and Innovation (NACOSTI).

3. Results

3.1 Descriptive statistics

Table 2 summarises the main variables. Following Bulmer (1979), a variable was treated as skewed when its skewness lay outside ± 1 ; for such variables the median and inter quartile range (IQR) are the preferred summaries. Average board tenure was 8.01 years (SD = 5.09; median = 7.15), ranging from 0.5 to 25 years. The moderate right skew (0.82) reflects a group of firms with long-serving boards. The FRI was right-skewed, with a median of 0.223 (IQR = 0.229); most firms carried low to moderate financial risk, while four firms had an average index above 0.5. After winsorization, the median ROA was 3.87% (IQR

= 7.76 percentage points) and the median ROE 6.00% (IQR = 13.20 percentage points). Twenty of the 28 firms reported a negative ROA in at least one year. Median ROA fell to its lowest level of

1.35% in 2023, during the period of currency volatility and tight monetary conditions, before recovering to 4.46% in 2024.

Table 2. Descriptive statistics and panel decomposition of variation

Variable	N	Mean	SD (overall)	SD (between)	SD (within)	Median	IQR	Skewness
Board tenure (years)	252	8.0074	5.0857	4.8968	1.6280	7.1500	—	0.818
Financial Risk Index	252	0.2742	0.1746	0.1674	0.0581	0.2228	0.2290	1.437
Current ratio	252	—	—	—	—	1.6486	2.5874	1.800
Leverage (D/E)	252	—	—	—	—	0.0585	0.2985	1.498
Asset concentration	252	0.5164	0.1999	—	—	—	—	0.443
ROA (winsorized)	252	0.0367	0.1248	0.0949	0.0828	0.0387	0.0776	-1.171
ROE (winsorized)	244	0.0508	0.3201	0.1821	0.2635	0.0600	0.1320	-3.987
Governance controls								
Board size	252	8.2302	2.1798	2.0254	0.8832	—	—	0.497
Board independence	252	0.4942	0.1848	0.1711	0.0762	—	—	0.218
Board gender diversity	252	0.1878	0.1400	0.1171	0.0795	—	—	0.076
Ownership concentration	252	0.7182	0.1472	0.1464	0.0302	0.7706	—	-0.526

Note. Between SD is computed on the 28 firm means; within SD on deviations from firm means. ROA and ROE winsorized at the 1st and 99th percentiles; ROE unavailable for eight years for one firm. For skewed variables ($|\text{skewness}| > 1$) the median and IQR are the appropriate summaries. — = not reported. *Source:* Research data (2026).

The panel decomposition shows that board tenure varied mainly between firms: its between-firm standard deviation (4.90 years) was three times its within-firm standard deviation (1.63 years). The FRI was similarly dominated by persistent between-firm differences (0.167 against 0.058), so both tenure and risk profiles are largely stable firm characteristics. Performance behaved differently: between-firm and within-firm

variation in ROA were of similar size, and within-firm variation in ROE exceeded between-firm variation. This pattern justifies a model that estimates between-firm as well as within-firm effects, since a fixed-effects model alone would rely on the small within-firm changes in tenure. The validity and reliability of the FRI were assessed before use. The three components were positively and significantly correlated ($r = 0.244$

to 0.587, all $p < 0.001$). Cronbach's alpha on standardised items was 0.642, which is acceptable for short, exploratory scales (Nunnally, 1978; Hair et al., 2019). Principal component analysis extracted a single component with an eigenvalue above one (1.772), explaining 59.1% of the variance, with loadings of 0.855 (liquidity), 0.836 (leverage) and 0.585 (asset concentration) (Kaiser, 1960). The Kaiser-Meyer-Olkin measure was 0.580, above the 0.50 minimum (Kaiser, 1974). The equally weighted index correlated at 0.998 with both a PCA-weighted and a standardised equal-weight alternative, so the weighting scheme does not affect the ranking of firms.

3.2 Correlation analysis

Table 3 reports Pearson and Spearman correlations among board tenure, the FRI and the performance measures. Board tenure was

negatively correlated with financial risk under both measures ($r = -0.338$; $\rho = -0.259$; both $p < 0.001$), indicating that firms with longer-serving boards tended to carry less financial risk. Board tenure was not significantly correlated with ROA or ROE under either measure. The FRI was negatively correlated with ROA ($r = -0.320$; $\rho = -0.176$), while its negative correlation with ROE was significant under Pearson only, suggesting that the latter is driven by a few extreme observations. Board tenure was also negatively correlated with board gender diversity ($r = -0.351$), board size ($r = -0.222$) and board independence ($r = -0.190$), so boards with long-serving directors tended to be smaller, less diverse and less independent, which underlines the need to control for these attributes. All variance inflation factors were below 1.5 (mean = 1.33), so multicollinearity was not a concern.

Table 3. Correlations among board tenure, financial risk and performance

Pair	Pearson r	p-value	Spearman ρ	p-value
Board tenure - FRI	-0.338*	< 0.001	-0.259*	< 0.001
Board tenure - ROA	0.033	0.606	-0.046	0.478
Board tenure - ROE	-0.090	0.163	-0.071	0.266
FRI - ROA	-0.320*	< 0.001	-0.176*	0.006
FRI - ROE	-0.144*	0.025	-0.086	0.183
ROA - ROE	0.792*	< 0.001	0.952*	< 0.001
Board tenure and governance controls				
Board tenure - board size	-0.222*	< 0.001	-0.178*	0.005
Board tenure - board independence	-0.190*	0.003	-0.153*	0.017
Board tenure - board gender diversity	-0.351*	< 0.001	-0.324*	< 0.001
Board tenure - ownership concentration	0.117	0.063	0.025	0.694

Note. * $p < 0.05$ (two-tailed). Pearson: pairwise deletion, $N = 252$ (244 for ROE). Spearman: casewise deletion, $N = 244$. Source: Research data (2026).

3.3 Diagnostic tests and model selection

The panel RESET did not reject correct specification for any of the fixed-effects models ($p \geq 0.13$). The modified Wald test rejected

homoskedasticity ($p < 0.001$) and the Wooldridge test detected first-order serial correlation in all models ($p \leq 0.018$); both problems were addressed

by clustering standard errors by firm. The Pesaran CD test found no cross-sectional dependence ($p \geq 0.13$), and the Shapiro-Wilk test rejected normality of residuals ($p < 0.001$), which reflects the heavy tails of the performance measures and was addressed through winsorization, cluster-robust inference and the wild cluster bootstrap. The F-test ($F(27, 219) = 10.60, p < 0.001$) and the Breusch-Pagan LM test ($\chi^2 = 197.77, p < 0.001$) rejected pooled OLS in favour of panel estimators. The cluster-robust Mundlak test rejected random effects for the governance-FRI equation ($\chi^2(5) = 24.09, p < 0.001$), showing that within-firm and

between-firm effects differ, which supports the hybrid model. Year effects were jointly significant ($F(8, 27) = 2.68, p = 0.026$) and were included in all models.

3.4 Board tenure, financial risk and financial performance (H₀₁-H₀₃)

Table 4 reports the tenure and FRI coefficients from the three-equation system. The four governance controls were included in every equation in both their within-firm and between-firm forms.

Table 4. Hybrid within-between estimates of the mediation system

Variable	(1) ROA Model 1	(2) FRI Model 2	(3) ROA Model 3	(4) ROE Model 1	(5) FRI Model 2	(6) ROE Model 3
<i>Within-firm effects (deviation from firm mean)</i>						
Board tenure	0.0040	0.0032	0.0036	-0.0060	0.0026	-0.0043
	(0.0057)	(0.0040)	(0.0055)	(0.0154)	(0.0041)	(0.0183)
Financial Risk Index			0.1265			-0.6572
			(0.2272)			(1.0374)
<i>Between-firm effects (firm mean)</i>						
Board tenure	0.0011	-0.0146***	-0.0032	-0.0032	-0.0100**	-0.0078
	(0.0032)	(0.0050)	(0.0031)	(0.0056)	(0.0040)	(0.0057)
Financial Risk Index			-0.2967**			-0.4576
			(0.1250)			(0.3403)
<i>Model information</i>						
Governance controls	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
R ² (overall)	0.149	0.305	0.255	0.069	0.274	0.107
Observations / firms	252 / 28	252 / 28	252 / 28	244 / 28	244 / 28	244 / 28

Note. Pooled OLS estimation of the hybrid model; standard errors clustered by firm (28 clusters) in parentheses. Within-firm coefficients are identical to fixed-effects estimates. Governance controls (board size, board independence, board gender diversity, ownership concentration) enter as firm means and deviations. Columns (4)-(6) include the firm means of the year dummies (Wooldridge, 2019); column (5) is estimated on the ROE sample so that all paths share one sample. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Source: Research data (2026).

Board tenure and financial performance (H₀₁):

Board tenure was not significantly associated with ROA or ROE within firms ($\beta = 0.0040$, $p = 0.492$; $\beta = -0.0060$, $p = 0.698$) or between firms ($\beta = 0.0011$, $p = 0.728$; $\beta = -0.0032$, $p = 0.581$). H₀₁ is not rejected.

Board tenure and financial risk management (H₀₂):

Between firms, longer-serving boards were associated with significantly lower financial risk ($\alpha = -0.0146$, $p = 0.007$). A board whose directors had served five years longer on average was associated with an FRI 0.073 lower, about 0.44 of the between-firm standard deviation of the index. The association held on the ROE sample ($\alpha = -0.0100$, $p = 0.018$). Within firms, changes in tenure were not significantly associated with changes in financial risk ($\alpha = 0.0032$, $SE = 0.0040$). H₀₂ is rejected in the between-firm dimension and not rejected in the within-firm dimension.

Financial risk management and financial performance (H₀₃):

Between firms, and controlling for tenure and the other governance attributes, firms with a higher average FRI earned a significantly lower ROA ($\gamma = -0.2967$, $p = 0.025$): an index 0.10 higher was associated with an ROA about 3.0 percentage points lower. The corresponding ROE coefficient was negative but not significant ($\gamma = -0.4576$, $p = 0.190$). Within

firms, changes in the FRI were not associated with changes in ROA ($\gamma = 0.1265$, $p = 0.582$) or ROE ($\gamma = -0.6572$, $p = 0.532$). H₀₃ is rejected for ROA in the between-firm dimension only; as Section 3.6 shows, this result is tentative.

3.5 Mediating role of financial risk management (H₀₄)

Table 5 decomposes the total effect of board tenure into its direct and indirect components. Within firms, neither component path was significant, and the indirect effects were negligible (0.0004 for ROA and -0.0017 for ROE); all four bootstrap intervals included zero and neither Sobel test was significant. Between firms, both component paths were significant for ROA: longer tenure was associated with lower financial risk ($a = -0.0146$) and lower financial risk with higher ROA ($b = -0.2967$). The implied indirect effect was therefore positive ($a \times b = 0.0043$), which means that firms with longer-serving boards tended to earn a higher ROA through carrying less financial risk. This indirect effect was not statistically significant, however: the Sobel test gave $p = 0.066$, and both bootstrap intervals (-0.0006 , 0.0125) included zero, although narrowly. The between-firm indirect effect on ROE was also not significant, because the FRI was not significantly associated with ROE.

Table 5. Decomposition and bootstrap tests of the indirect effect of board tenure

Dimension / outcome	Total effect c	Path a	Path b	Direct effect c'	Indirect a × b	Sobel z (p)	95% CI (percentile)	95% CI (bias-corrected)
Within: ROA	0.0040	0.0032	0.1265	0.0036	0.0004	0.465 (0.642)	[-0.0030, 0.0024]	[-0.0006, 0.0047]
Within: ROE	-0.0060	0.0026	-0.6572	-0.0043	-0.0017	-0.452 (0.651)	[-0.0284, 0.0047]	[-0.0287, 0.0046]
Between: ROA	0.0011	-0.0146***	-0.2967**	-0.0032	0.0043	1.836 (0.066)	[-0.0006, 0.0125]	[-0.0006, 0.0125]
Between: ROE	-0.0032	-0.0100**	-0.4576	-0.0078	0.0046	1.186 (0.236)	[-0.0046, 0.0169]	[-0.0040, 0.0184]

Note. c from Model 1; a from Model 2; b and c' from Model 3 (Table 4). The indirect effect equals $c - c'$ exactly. Confidence intervals from 2,000 cluster-bootstrap replications (firms resampled with replacement; firm means recomputed in each replication). Sobel z uses firm-clustered standard errors. *** $p < 0.01$, ** $p < 0.05$. *Source:* Research data (2026).

Figure 2 summarises the between-firm estimates for ROA, the pathway closest to mediation.

Following Zhao et al. (2010), none of the four tenure-performance relationships showed any form of mediation: in every case both the indirect and the direct effects were not significant at the 5% level, which is classified as “no effect”. H_04 is therefore not rejected. The case closest to mediation was the between-firm path from board

tenure through financial risk to ROA, in which both component paths were significant but their product was not. A structural equation model estimated on firm-demeaned data produced identical within-firm direct, indirect and total effects, with delta-method standard errors that confirmed the absence of a significant indirect effect (indirect effect = 0.0004, $p = 0.553$).

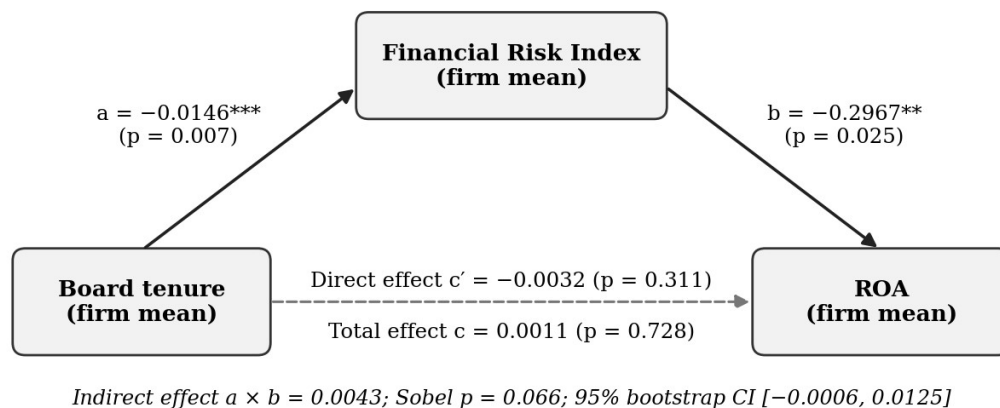


Figure 2. Estimated between-firm mediation paths for board tenure and ROA. Coefficients from Table 4; p-values in parentheses. *Source:* Research data (2026).

3.6 Robustness checks

The within-firm conclusions were unchanged when the models were re-estimated with random effects, with the PCA-weighted or standardized index, with the FRI components entered separately, with ROE winsorized at the 5th and 95th percentiles, without Comp-10, with Driscoll and Kraay (1998) standard errors and with governance lagged by one year. Quadratic terms for board tenure were not significant ($\text{tenure}^2 = 0.0005$, $\text{SE} = 0.0016$; joint test with board size squared $p = 0.578$), so there was no evidence of a non-linear tenure-performance relationship. Lagged tenure was not associated with ROA (0.0024, $\text{SE} = 0.0058$), the FRI (0.0019, $\text{SE} = 0.0041$) or ROE (-0.0083 , $\text{SE} = 0.0180$).

Table 6 reports the robustness of the two between-firm coefficients on which the rejections of H_02 and H_03 rest. The negative association between

board tenure and financial risk was significant at the 5% level or better in every check, including the wild cluster bootstrap ($p = 0.006$) and the between estimator, which regresses firm means on firm means ($p = 0.041$). The negative association between the FRI and ROA was significant in the main model, the random-effects hybrid, the between estimator and with the PCA-weighted index, but not under the wild cluster bootstrap ($p = 0.126$), only at the 10% level with stricter winsorization ($p = 0.082$), and not when Comp-10 was excluded ($p = 0.205$). Comp-10 had the highest average FRI in the sample (0.798, against a median of 0.22), the lowest average ROA (-0.239), a current ratio averaging 0.06 and leverage averaging 0.77, consistent with severe financial distress. The FRI-ROA association therefore rests largely on the contrast between this distressed firm and the rest of the sample.

Table 6. Robustness of the main between-firm coefficients

Specification	Board tenure → FRI	FRI → ROA	FRI → ROE
(1) Main hybrid model	−0.0146*** (0.007)	−0.2967** (0.025)	−0.4576 (0.190)
(2) Wild cluster bootstrap p-value	(0.006)	(0.126)	(0.376)
(3) Random-effects hybrid	−0.0146*** (0.003)	−0.2967** (0.013)	−0.4576 (0.160)
(4) Between estimator (N = 28)	−0.0146** (0.041)	−0.2967** (0.021)	−0.3517 (0.210)
(5) PCA-weighted FRI	−0.1047** (0.013)	−0.0396** (0.016)	−0.0638 (0.161)
(6) Performance winsorized 5/95	—	−0.1740* (0.082)	−0.2281 (0.374)
(7) Excluding Comp-10	−0.0100** (0.018)	−0.1818 (0.205)	−0.4576 (0.190)

Note. Between-firm coefficients with p-values in parentheses. (2) Rademacher weights, null imposed, 9,999 replications. (5) Coefficients per standard deviation of the PCA index, not comparable in size with (1). (6) Not applicable to the FRI equation. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. *Source:* Research data (2026).

4. Discussion of findings

The results have two layers. Within firms, changes in board tenure over the nine years were not associated with changes in financial risk or performance. Between firms, tenure was clearly associated with financial risk: firms with longer-serving boards carried significantly less risk, and firms with less risk tended to earn higher returns on assets. This distinction matters when the findings are compared with earlier studies, most of which estimate pooled or cross-sectional relationships and therefore mainly capture differences between firms.

4.1 Board tenure and financial performance

Board tenure was not directly associated with performance in either dimension. This differs from Korir et al. (2025), who reported a positive and significant relationship between board tenure and the performance of NSE-listed non-financial firms over 2014-2023, and from Livnat et al. (2021), who found higher valuations for US firms with longer-tenured boards. Differences in estimation may explain part of the contrast with Korir et al. (2025): the present study separates within-firm from between-firm variation, controls for common year effects and other board attributes, and uses conservative firm-clustered inference. The result is closer to Oon and Chia (2025), whose evidence shows that the effect of tenure depends on the director's role, with positive effects for chair tenure and negative effects for the tenure of independent directors; an average across all directors may combine these opposing effects. Huang and Hilary (2018) reported an inverted-U relationship between board tenure and performance, but the quadratic specification here found no evidence of non-linearity.

The absence of a direct effect is consistent with Upper Echelons Theory's own caution that demographic characteristics are imperfect proxies

for the cognitive processes that drive decisions (Lawrence, 1997). It also suggests that, in this

market, tenure does not translate straightforwardly into profitability, possibly because accounting returns are shaped by sectoral and macroeconomic shocks that boards cannot fully offset, as the sharp fall in median ROA in 2023 illustrates.

4.2 Board tenure and financial risk management

The most robust finding is that firms with longer-serving boards carried significantly less financial risk. The association held in every robustness check, including the wild cluster bootstrap and the between estimator. It agrees with Ji et al. (2021), who found that board tenure structure is significantly related to firm risk across 37 countries, and with the broader evidence that governance shapes risk-management outcomes (Malik et al., 2020; Bhuiyan et al., 2021; Aziza & Aviola, 2024; Fauziah et al., 2025). The finding supports the Upper Echelons view that directors' experience shapes strategic choices (Hambrick & Mason, 1984) and stewardship arguments that long-serving directors accumulate firm-specific knowledge and act as committed stewards (Davis et al., 1997). Experienced boards appear to favour more liquid and less leveraged positions and more diversified asset bases. From a Resource Dependence perspective, long tenure may also sustain stable relationships with lenders and other stakeholders that reduce reliance on risky financing (Pugliese et al., 2014).

Within firms, changes in tenure were not associated with changes in risk. Tenure and risk profiles therefore appear to be long-standing firm characteristics, shaped by industry, ownership history and business model, rather than the product of year-to-year board changes. This is consistent with Wintoki et al. (2012), who found that apparent effects of board structure largely disappear once unobserved heterogeneity and the dynamic nature of governance are controlled for.

Because the between-firm coefficient compares different firms, it describes an association rather than the effect of lengthening a particular board's tenure; stable firm characteristics correlated with both tenure and risk may contribute to it.

4.3 Financial risk management and financial performance

Firms with higher financial risk earned lower returns on assets across firms. The direction agrees with studies linking risk management to performance, including Muhia (2025) for NSE-listed firms, Malik et al. (2020) for UK firms and Kijkasiwat et al. (2022), who found that excessive leverage was associated with poorer performance. The result must, however, be qualified. It depends largely on one financially distressed firm and was not significant under the wild cluster bootstrap. It therefore shows that extreme financial risk accompanies poor performance, but not that moderate differences in risk matter for the typical firm. The moderate internal consistency of the FRI ($\alpha = 0.64$) and the fact that it measures risk exposure rather than risk-management practice may have weakened the within-firm relationship.

4.4 The mediating role of financial risk management

Financial risk management did not significantly mediate the tenure-performance relationship in either dimension. This differs from Aziza and Aviola (2024), who found partial mediation by risk management in Indonesian banks, and from Kijkasiwat et al. (2022), who found that leverage mediated the governance-performance relationship. It agrees with Onguka et al. (2021), who found no significant intervening effect of capital structure between governance and firm value for NSE-listed firms, and with Fauziah et al. (2025), who found no mediation by risk governance. Methodological differences may contribute to the contrast: studies that infer mediation from changes in coefficients across separately estimated models, rather than testing

the indirect effect directly with the same estimator and sample, may overstate mediation (Zhao et al., 2010). Importantly, the between-firm pattern for board tenure was in the direction the mediation model predicts: longer tenure was associated with lower risk, and lower risk with higher ROA. With only 28 firm means, the between-firm test has limited power to detect an indirect effect of this size, so the result should be read as an absence of evidence rather than evidence of absence.

4.5 Implications of the study

Theoretically, the findings qualify the proposition that board tenure improves performance directly and suggest that its main relevance lies in the firm's risk profile. They support integrating Upper Echelons and stewardship arguments with the ERM framework. That is, experience at board level is associated with conservative financial positions, although the performance pay-off of that conservatism is not demonstrated for typical firms. For boards and nomination committees, the results caution against rigid tenure limits that remove experienced directors. Board renewal policies should balance fresh perspectives with the retention of institutional memory, and boards should monitor liquidity, leverage and asset-concentration exposures directly through a defined risk appetite and regular reporting. For the CMA and the NSE, the evidence suggests that supervisory attention could move beyond structural compliance, such as tenure caps, towards the quality of board-level risk oversight, including risk committees and standardised financial risk disclosures. For investors, persistently high financial risk exposure may be a more informative warning sign than tenure or other board-structure indicators.

5. Conclusion

This study examined whether financial risk management mediates the relationship between board tenure and the financial performance of NSE-listed non-financial firms over 2016-2024.

Four conclusions follow. First, board tenure was not directly associated with ROA or ROE, either within firms over time or between firms. Second, firms with longer-serving boards headless financial risks, a finding that was robust to every alternative estimator, index construction and method of inference. Board experience is therefore associated with more conservative financial positions. Third, firms with higher financial risk earned lower returns on assets. Fourth, financial risk management did not significantly mediate the tenure-performance relationship. However, the between-firm pathway from longer tenure through lower risk to higher ROA ran in the predicted direction.

Taken together, these findings indicate that board tenure matters for the financial risk that Kenyan listed non-financial firms carry more than for their profitability. By separating within-firm from between-firm effects and testing the indirect effect directly, the study also shows why direct-effect studies of tenure may reach conflicting conclusions. As a recommendation, policies on board renewal should weigh the value of experienced directors in containing financial risk. Also future research could focus on larger samples and direct risk-management practices.

References

- Akram, F., & Abrar Ul Haq, M. (2022). Integrating agency and resource dependence theories to examine the impact of corporate governance and innovation on firm performance. *Cogent Business & Management*, 9(1), Article 2152538.
- Aluoch, M. O. (2023). Corporate governance and performance of commercial banks listed at the Nairobi Securities Exchange, Kenya. *European Scientific Journal, ESJ*, 19(10), 194.
- Andersen, T. G., Bollerslev, T., Christoffersen, P. F., & Diebold, F. X. (2013). Financial risk measurement for financial risk management. In G. M. Constantinides, M. Harris, & R. M. Stulz (Eds.), *Handbook of the economics of finance* (Vol. 2, pp. 1127-1220). Elsevier.
- Aziza, N., & Aviola, N. K. (2024). The influence of corporate governance on financial performance with risk management as mediating variable. *Jurnal Aplikasi Bisnis dan Manajemen*, 10(1), 11.
- Baltagi, B. H. (2021). *Econometric analysis of panel data* (6th ed.). Springer.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
- Bell, A., & Jones, K. (2015). Explaining fixed effects: Random effects modeling of time-series cross-sectional and panel data. *Political Science Research and Methods*, 3(1), 133-153.
- Bhuiyan, M. B. U., Cheema, M. A., & Man, Y. (2021). Risk committee, corporate risk-taking and firm value. *Managerial Finance*, 47(3), 285-309. <https://doi.org/10.1108/MF-07-2019-0317>
- Bulmer, M. G. (1979). *Principles of statistics*. Dover Publications.
- Cameron, A. C., Gelbach, J. B., & Miller, D. L. (2008). Bootstrap-based improvements for inference with clustered errors. *The Review of Economics and Statistics*, 90(3), 414-427.
- Capital Markets Authority. (2015). *The Code of Corporate Governance Practices for Issuers of Securities to the Public, 2015* (Gazette Notice No. 1420). Government Printer.
- Capital Markets Authority. (2025). *The capital markets soundness report (CMSR)*. Capital Markets Authority.
- Committee of Sponsoring Organizations of the Treadway Commission. (2017). *Enterprise*

- risk management: Integrating with strategy and performance.* COSO.
- Darouichi, A., Kunisch, S., Menz, M., & Cannella, A. A. (2021). CEO tenure: An integrative review and pathways for future research. *Corporate Governance: An International Review*, 29(6), 661-683.
- Davis, J. H., Schoorman, F. D., & Donaldson, L. (1997). Toward a stewardship theory of management. *Academy of Management Review*, 22(1), 20-47.
- Driscoll, J. C., & Kraay, A. C. (1998). Consistent covariance matrix estimation with spatially dependent panel data. *The Review of Economics and Statistics*, 80(4), 549-560.
- Drukker, D. M. (2003). Testing for serial correlation in linear panel-data models. *The Stata Journal*, 3(2), 168-177.
- East African Cables PLC v Equity Bank (Kenya) Limited, [2024] KEHC 14009 (KLR) (Kenya).
<https://new.kenyalaw.org/akn/ke/judgment/kehc/2024/14009/eng@2024-11-11>
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review*, 14(1), 57-74.
- Fatihudin, D., & Mochklas, M. (2018). How measuring financial performance. *International Journal of Civil Engineering and Technology*, 9(6), 553-557.
- Fauziah, F., Atiqah, N., Kurniati, P., Prihantono, P., & Komaruddin, M. S. (2025). Corporate governance, risk management, and financial performance: The mediating role of risk governance in Indonesia's Islamic banks. *Shirkah: Journal of Economics and Business*, 10(2).
- Gaur, S. S., Bathula, H., & Singh, D. (2015). Ownership concentration, board characteristics and firm performance: A contingency framework. *Management Decision*, 53(5), 911-931.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.
- Hambrick, D. C. (2007). Upper echelons theory: An update. *Academy of Management Review*, 32(2), 334-343.
- Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, 9(2), 193-206.
- Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica*, 46(6), 1251-1271.
- Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (2nd ed.). Guilford Press.
- Hoyt, R. E., & Liebenberg, A. P. (2011). The value of enterprise risk management. *Journal of Risk and Insurance*, 78(4), 795-822.
- Huang, S., & Hilary, G. (2018). Zombie board: Board tenure and firm performance. *Journal of Accounting Research*, 56(4), 1285-1329.
- In re Cytonn High Yields Solutions (In Liquidation), [2024] KEHC 81 (KLR) (Kenya).
<https://new.kenyalaw.org/akn/ke/judgment/kehc/2024/81/eng@2024-01-17>
- In re Nakumatt Holdings Limited, [2017] KEHC 2266 (KLR) (Kenya). Kenya Law.
- International Organization for Standardization. (2018). *Risk management — Guidelines* (ISO Standard No. 31000:2018). ISO.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.
- Ji, J., Peng, H., Sun, H., & Xu, H. (2021). Board tenure diversity, culture and firm risk: Cross-country evidence. *Journal of International Financial Markets*,

- Institutions and Money*, 70, Article 101276.
- Jiao, H. (2025). Research on diversification of asset allocation and risk management in the context of globalization. *Financial Engineering and Risk Management*, 8(2).
- Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement*, 20(1), 141-151.
- Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39(1), 31-36.
- Kijkasiwat, P., Hussain, A., & Mumtaz, A. (2022). Corporate governance, firm performance and financial leverage across developed and emerging economies. *Risks*, 10(10), Article 185.
- Kiptanui, T. (2020). Does corporate governance mechanisms matter in explaining risk management? Evidence from non-financial Kenyan listed firms. *Journal of Economics and Financial Analysis*, 4(1), 79-97.
- Korir, A., Cheruiyot, T., & Bii, P. (2025). The effect of board tenure and CEO duality on firm performance of companies listed in Nairobi's stock exchange. *European Journal of Business and Strategic Management*, 10(5), 31-43.
- Lawrence, B. S. (1997). The black box of organizational demography. *Organization Science*, 8(1), 1-22.
- Leone, A. J., Minutti-Meza, M., & Wasley, C. E. (2019). Influential observations and inference in accounting research. *The Accounting Review*, 94(6), 337-364.
- Livnat, J., Smith, G., Suslava, K., & Tarlie, M. (2021). Board tenure and firm performance. *Global Finance Journal*, 47, Article 100535.
- Malik, M. F., Zaman, M., & Buckby, S. (2020). Enterprise risk management and firm performance: Role of the risk committee. *Journal of Contemporary Accounting & Economics*, 16(1), Article 100178.
- Manzoor, F., Wei, L., & Sahito, N. (2021). The role of SMEs in rural development: Access of SMEs to finance as a mediator. *PLoS ONE*, 16(3), Article e0247598.
- Muhia, N. K. (2025). Influence of corporate governance practices on the financial performance of investment firms trading at the NSE. *International Journal of Leadership and Governance*, 5(1), 35-46.
- Mundlak, Y. (1978). On the pooling of time series and cross section data. *Econometrica*, 46(1), 69-85.
- Muriithi, J. G., & Waweru, K. M. (2017). Liquidity risk and financial performance of commercial banks in Kenya. *International Journal of Economics and Finance*, 9(3), 256.
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). McGraw-Hill.
- Onguka, D., Iraya, C. M., & Nyamute, W. L. (2021). Corporate governance, capital structure, ownership structure, and corporate value of companies listed at the Nairobi Securities Exchange. *European Scientific Journal, ESJ*, 17(15), 300.
- Onsongo, S. K., Muathe, S. M. A., & Mwangi, L. W. (2020). Financial risk and financial performance: Evidence and insights from commercial and services listed companies in Nairobi Securities Exchange, Kenya. *International Journal of Financial Studies*, 8(3), Article 51.
- Oon, E. Y. N., & Chia, W. (2025). Board of directors' tenure and firm performance: Evidence from Malaysia. *JurnalPengurusan*, 74.
- Pesaran, M. H. (2004). *General diagnostic tests for cross section dependence in panels* (CESifo Working Paper No. 1229). CESifo.
- Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations: A resource dependence perspective*. Harper & Row.

- Power, M. (2009). The risk management of nothing. *Accounting, Organizations and Society*, 34(6-7), 849-855.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879-891.
- Pugliese, A., Minichilli, A., & Zattoni, A. (2014). Integrating agency and resource dependence theory: Firm profitability, industry regulation, and board task performance. *Journal of Business Research*, 67(6), 1189-1200.
- Schunck, R. (2013). Within and between estimates in random-effects models: Advantages and drawbacks of correlated random effects and hybrid models. *The Stata Journal*, 13(1), 65-76.
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology*, 13, 290-312.
- Vafeas, N. (2003). Length of board tenure and outside director independence. *Journal of Business Finance & Accounting*, 30(7-8), 1043-1064.
- Walters, B. A., Kroll, M. J., & Wright, P. (2007). CEO tenure, boards of directors, and acquisition performance. *Journal of Business Research*, 60(4), 331-338.
- Wintoki, M. B., Linck, J. S., & Netter, J. M. (2012). Endogeneity and the dynamics of internal corporate governance. *Journal of Financial Economics*, 105(3), 581-606.
- Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data* (2nd ed.). MIT Press.
- Wooldridge, J. M. (2019). Correlated random effects models with unbalanced panels. *Journal of Econometrics*, 211(1), 137-150.
- Zhang, Z., Zyphur, M. J., & Preacher, K. J. (2009). Testing multilevel mediation using hierarchical linear models: Problems and solutions. *Organizational Research Methods*, 12(4), 695-719.
- Zhao, X., Lynch, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research*, 37(2), 197-206.